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Development and validation of a measure of cybersexual addiction

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MEASURE OF CYBERSEXUAL ADDICTION

Development and Validation of a Measure of Cybersexual Addiction

by

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Dissertation Defense

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Abstract

Sexual addiction has long been a controversial topic, and it has become no less tendentious with its latest incarnation as Internet cybersexual addiction, i.e., the addiction to sexual materials on the Internet. As cybersexual addiction is a relatively recent phenomenon, it is important to have adequate measures to assess the behavior and provide empirical support for diagnostic criteria. While a number of measures are used in the research, none of the measures are based on the currently proposed diagnostic criteria. This study aimed to develop a new measure of cybersexual addiction based on the proposed hypersexual disorder diagnostic criteria and to better understand the relationship between cybersexual addiction, shame, loneliness, anxiety, depression, offline sexual addiction behavior, and Internet addiction. This study provides support for the use of two already established measures. Further, shame, loneliness, sexual compulsivity, and compulsive Internet use were all found to predict cybersexual behavior, whereas substance abuse was inversely related to the behavior. Finally, a model of the predictive correlates found that sexual compulsivity, compulsive Internet use, and depression provided the strongest predictive value. The results imply that additional validation is needed for the Problematic Cybersexual Behavior Scale and the Internet Sex Screening Test for use across general samples. Further, the model of prediction provides support for the role of offline sexual addiction in the development of cybersexual addiction.

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Development and Validation of a Measure of Cybersexual Addiction

Introduction

Since the publication of *Out of the Shadows: Understanding Sexual Addiction* (Carnes, 1983), sexual addiction has appeared more frequently in popular culture. While there have been several other books written on the topic, Carnes's 1983 treatment manual was the first to argue for the existence of such problematic sexual behavior in a way that the public could understand. The diagnosis has remained controversial for the three decades since the publication of this book (Goodman, 1998). Some researchers have argued that social mores define excessive sexual behavior and that there is no way to objectively identify what is pathological (Touissant & Pitchot, 2013). In addition, there have been a number of proposed criteria for sexual addiction (Carnes, 1991; Goodman, 1998; Kafka, 2010), but no criteria have been published in recent *Diagnostic and Statistical Manuals*. Despite the lack of clear diagnostic criteria and controversy around the diagnosis, clinicians are still seeing clients present for treatment with concerns about their putatively excessive sexual behaviors and the incumbent consequences thereof. This introduction covers the diagnosis of cybersexual addiction, the correlates of this diagnosis, and the measures currently used to assess this experience.

As current research on sexual addiction has been published using several different terms, an understanding of the key constructs and developing terminology within this literature should first be established (Samenow, 2010). *Sexual compulsivity* denotes that the individual feels compelled to engage in sexual behavior to cope with negative emotions and cognitions (McCarthy, 1994), similar to obsessive-compulsive behaviors. A second term, *sexual impulsivity*, is used less frequently and implies that excessive sexual behavior is the consequence of broader impulse control difficulties, similar to the conceptualization of other impulse control disorders

(e.g., gambling; Barth & Kinder, 1986). Third, the term used for the proposed *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013) criteria is *hypersexuality*, which focuses on the individual engaging in excessive sexual behavior of any kind; this term functions as a generic term (Kafka, 2010). Fourth, psychologists and the public at large use the term *sexual addiction* most frequently. It defines excessive sexual behavior as more closely related to substance abuse and other addictive behaviors, particularly with regard to withdrawal and tolerance associated with sexual behavior (Carnes, 1983). For the purposes of consistency and as much of the literature uses the term “sexual addiction,” this dissertation will use the term sexual addiction to refer to excessive sexual behavior and in the discussion of problematic cybersexual behavior.

Literature Review

Cybersexual Behavior

With the advent and increased accessibility of the Internet, a significant subtype of sexual addiction, cybersexual addiction or addiction to sexual materials on the Internet, has appeared (Schwartz & Southern, 2000). Cybersexual behavior includes viewing pornography online, engaging in sexually explicit chat room behavior, viewing individuals on live camera or putting oneself on live camera performing sexual acts for money (camming), and arranging to meet people offline for sexual behavior. Notably, in 2011, a live webcam website was the most trafficked sexual site suggesting that this behavior is occurring at high rates (Ruvolo, 2011). It is important to include all variations of sexual behavior in the definition of cybersexual behavior as individuals may vary in their preference for type of online sexual material and platform.

It is crucial to understand what drives this behavior. Cooper (1998) identified three factors associated specifically with the Internet that may explain why individuals who do not

evidence offline sexually addictive behavior experience problematic sexual behavior on the Internet.

The Triple-A Engine

Cooper theorizes that the following factors create a diathesis for the development of cybersexual addiction: (a) anonymity, (b) affordability, and (c) accessibility (Cooper, 1998).

How does this happen? Let us start with the construct of anonymity. In this context, anonymity refers to the fact that very few pornographic websites require disclosure of the individual's legal name or other identifying information prior to accessing the sexual material. Further, maintaining one's unidentifiable status is further facilitated by a user's ability to block "cookies" or other information that might otherwise be stored in the user's history and allow interested others (e.g., partners or employers) to track a person's Internet use history. The second factor is affordability. For most individuals, particularly in the United States, the Internet is attainable for a relatively low cost and most homes have Internet access. Additionally, affordability includes the individual's ability to locate free sexual material or engage with others in sexually explicit interaction without a fee or for a very low fee (Cooper, 1998). The third factor is accessibility, which is defined by Cooper (1998) as the ability to log-on to the Internet and access sexual material at almost any time. This also includes the ability to access the sexual material of one's choice at any time.

Together, the aforementioned three factors comprise the "Triple-A Engine" (Cooper, 1998). This engine is theorized to have contributed significantly to the development of cybersexual addiction for individuals who may or may not have had problems with sexual addiction offline (Cooper, 1998). Thus, due to these constructs, a new diagnosis of cybersexual addiction needs to be understood and addressed by researchers and clinicians. This study aims to

better understand the diagnosis of cybersexual addiction by developing a new measure to assess for cybersexual addiction behavior in both research and clinical populations.

Models of Cybersexual Addiction

There are two notable models of cybersexual addiction used in the literature. The first is based heavily on the sexual offender model (Bensimon, 2007), while the second considers it outside of a judicial frame (Young, 2008). While these models have many similarities, the second model by Young (2008) proposes several additional steps in the development of cybersexual addiction for non-sexual offending populations. Consequently, it is a much more comprehensive description of this condition.

Bensimon (2007) proposed a two-step model of cybersexual addiction based on relevant literature on sexual offenders who were diagnosed with a cybersexual addiction. The proposed model was developed to understand the role of pornography in sexual offending. This model proposes that the first step in the process of developing cybersexual addiction is the development of a compulsive dependence on Internet-based sexual material. Bensimon (2007) theorizes that individuals begin to use Internet-based sexual material because they are curious but that over time it progresses to a compulsive behavior. It is unclear what the intermediate steps are in the progression from curiosity to compulsive behavior. The second step is the repeated failure to end one's compulsive use of cybersexual material and the frustration the individual experiences during this process. Bensimon proposes that individuals who attempt to quit experience withdrawal and eventually return to the material in an effort to reduce their discomfort. While this model is similar to that of a substance abuse model, it has not been empirically tested and is based solely on literature of sexual offenders who use pornography prior to or as part of their sexual offending. This limits the applicability of this particular model to the non-sexual

offending populations who may also struggle with online sexual behavior, because of the development of the model on sexual offenders who may present with earlier concerns related to illegal sex acts prior to involvement in illegal cybersex.

The second model is based on the literature on individuals who struggle with cybersexual addiction, but who are neither sexual offenders offline, nor viewing illegal material online (Young, 2008). This model contains five steps: (a) discovery, (b) experimentation, (c) escalation, (d) compulsion, and (e) hopelessness. The first stage, discovery, begins with curiosity and benign interest in both the Internet and cybersexual material. Stage One is notably similar to Bensimon's initial stage (2007). The second stage, experimentation, involves individuals exploring different types of online sexual behavior. The anonymity of the Internet further enables the process as individuals may feel safer seeking out taboo materials as the information remain disconnected from the individual's identifying information (Quinn & Forsyth, 2005). The third stage, escalation, is the act of the person beginning to look for new and thrilling material, as the old material no longer produces the desired effect (Young, 2008). Stage Three is where individuals may begin to engage in riskier forms of cybersexual behavior, including giving out their real name, watching illegal material, or arranging to meet people in person. The fourth stage, compulsivity, involves the individual's cybersexual engagement becoming chronic and compulsive. Young (2008) proposes that in this stage an individual with cybersexual addiction is driven to engage in the behavior by feelings of discomfort or stress. The fifth stage, hopelessness, corresponds to Bensimon's second and final stage, as the individual reaches a point where he/she is aware of the damage caused by his/her addiction and begins trying to quit. Young notes that the individual is unable to remain "sober" for long and is often drawn back into the behavior during times of stress. While the model is based upon the theoretical and empirical

literature of non-sexual offending cybersexual addiction, there is no empirical work to validate this model. However, it should be noted that Young's model might best fit at-risk users as described by Cooper, Putnam, Planchon, and Boies (1999) because of the focus on the development of the addiction behaviors solely on the Internet as opposed to a transfer of behaviors from offline sex addiction to online behavior. For the purposes of this study, Young's 2008 model of cybersexual addiction was considered during the development of the new measure, as it appears to more fully encompass the process of the development and maintenance of cybersexual addiction and corresponds with the proposed hypersexual disorder diagnostic criteria (Kafka, 2010). The model also seems to better fit a nonoffending group as the escalation into illegal or taboo material occurs over time as a function of the addiction, as opposed to the desire preceding the cybersex concerns.

Diagnosing Cybersexual Addiction

Diagnostic criteria. There are no standard diagnostic criteria for sexual or cybersexual addiction in the literature or the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013). However, a number of researchers have proposed criteria for sexual addiction and hypersexuality that have been used for the diagnosis of both online and offline problematic sexual behavior (Carnes, 1991; Goodman, 1998; Kafka, 2010). Each of the sets of criteria, including Kafka's 2010 criteria for hypersexuality, is based on a significant amount of theoretical work, case studies, and the substance abuse and behavioral addiction criteria (Samenow, 2011). Research is needed to provide empirical support for the above named diagnostic criteria, both through measurement development utilizing specific criteria and further study of correlates of the construct. While, Carnes (1991), Goodman (1998), and Kafka's (2010) sets of proposed criteria have been used in the literature, Kafka's

2010 proposed hypersexual disorder diagnostic criteria are the most frequently cited in the last five years. Kafka proposed these criteria for placement in the DSM-5 (see Table 1, below) as the proposed hypersexual disorder diagnostic criteria, but they were not accepted for the final publication due to lack of empirical support and ongoing lack of specificity and clarity around the conceptualization of sex addiction. When compared to older sets of criteria such as those proposed by Carnes (1991) and Goodman (1998), the advantage of the hypersexual disorder criteria is that the duration of the problematic behavior is significantly shorter (6 months versus 12 months). While this is markedly different from the criteria for other behavioral addictions (e.g., gambling), the shorter time requirement decreases the likelihood of false negatives and increases the possibility of earlier treatment; however, the change is not based in empirical findings. Further, this set of criteria not only requires the individual to experience personal distress, but also specifically rules out the behavior as a result of substance abuse or medication (Kafka, 2010). As these criteria were the most frequently cited criteria in the literature for the past five years, this study will base the new measure questions on the DSM-5 proposed hypersexual disorder diagnostic criteria in order to provide empirical validation for the use of these criteria in a research setting.

While the term *hypersexuality* is frequently used in the literature and is used to label the proposed criteria, it denotes generic excessive sexual behavior and does not specify an etiology of, or model supporting this diagnosis. As this dissertation conceptualizes and aims to measure excessive sexual behavior as an addiction, it is important to note that each of the five symptoms correspond to several of the nine symptoms used to diagnose gambling disorder (American Psychiatric Association, 2013). Further, the proposed diagnostic criteria are similar to that of

substance use disorders, denoting an addiction rather than an impulsive or compulsive disorder.

See Table 1 for the full criteria.

Table 1

Proposed Hypersexual Disorder Diagnostic Criteria (Kafka, 2010)

-
- A. Over a period of at least 6 months, recurrent and intense sexual fantasies, sexual urges, or sexual behaviors in association with 3 or more of the following 5 criteria:
1. Time consumed by sexual fantasies, urges, or behaviors repetitively interferes with other important (non-sexual) goals, activities, and obligations.
 2. Repetitively engaging in sexual fantasies, urges, or behaviors in response to dysphoric mood states (e.g., anxiety, depression, boredom, irritability).
 3. Repetitively engaging in sexual fantasies, urges, or behaviors in response to stressful life events.
 4. Repetitive but unsuccessful efforts to control or significantly reduce these sexual fantasies, urges, or behaviors.
 5. Repetitively engaging in sexual behaviors while disregarding the risk for physical or emotional harm to self or others.
- B. There is clinically significant personal distress or impairment in social, occupational, or other important areas of functioning associated with the frequency and intensity of these sexual fantasies, urges, or behaviors.
- C. These sexual fantasies, urges, or behaviors are not due to the direct physiological effect of an exogenous substance (e.g., a drug of abuse or a medication)

Specify if:

Masturbation

Pornography

Sexual Behavior with Consenting Adults

Table 1 continued

Cybersex
Telephone Sex
Strip Clubs
Other:

While the above criteria include cybersex as specified, it is theorized that cybersexual addiction occurs at the intersection of sexual addiction and Internet addiction, and therefore, it is important to review the Internet addiction criteria. The Internet addiction criteria proposed by Tao and colleagues (2010) focus on an addiction model of excessive Internet use (see Table 2, below). To meet criteria, the individual must experience both preoccupation with the Internet and withdrawal after not having access to the Internet (Tao et al., 2010). Second, the individual must meet one or more of the following criteria: tolerance, desire or attempts to cut back, ongoing excessive use of the Internet, and usage to escape a dysphoric mood. This diagnosis must not be better accounted for by a psychotic or mood disorder, the excessive use must cause a significant functional impairment to the individual, and the excessive use must have lasted 3 months with a minimum of 6 hours of daily usage (Tao et al., 2010). While these criteria have clear behavioral parameters, much like the sexual addiction criteria, there has been little empirical validation. Like Kafka's proposed criteria, Tao and colleagues' Internet addiction criteria were not included in the DSM-5. For this dissertation, the Internet addiction criteria have also been considered in the development of the measure. Specifically, with the exception of withdrawal and loss of interest in other hobbies, the Internet addiction criteria are similar to the proposed hypersexual

disorder diagnostic criteria. Thus, a question specifically targeting withdrawal was included in the proposed measure.

Table 2

Proposed Internet Addiction Diagnostic Criteria

A. Symptom criterion

All of the following must be present

1. Preoccupation with the Internet (think about previous online activity or anticipates next online session)
2. Withdrawal, as manifested by a dysphoric mood, anxiety, irritability, and boredom after several days without internet activity
3. At least one (or more) of the following:
 - a. Tolerance, marked increase in Internet use required to achieve satisfaction
 - b. Persistent desire and/or unsuccessful attempts to control, cut back, or discontinue Internet use
 - c. Continue excessive use of Internet despite knowledge of having a persistent or recurrent physical or psychological problem likely to have been exacerbated by Internet use
 - d. Loss of interests, previous hobbies, entertainment as a direct result of, and with the exception of, Internet use
 - e. Uses the Internet to escape or relieve a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety)

B. Exclusion criterion

Table 2 continued

Excessive Internet use is not better accounted for by psychotic disorders or bipolar I disorder

C. Clinically significant impairment criterion

Functional impairments (reduced social, academic, working ability), including loss of a significant relationship, job, educational or career opportunities

D. Course criterion

Duration of Internet addiction must have lasted for an excess of 3 months, with at least 6 hours of Internet usage (non-business/non-academic) per day.

Amount of time spent online. The current form of diagnosis used in the research literature is based both on the amount of time an individual spends engaged in cybersexual behavior during a week-long period, as well as the number of symptoms associated with sexual addiction he/she experiences (Cooper, Delmonico, Griffin-Shelley, & Mathy, 2004). The amount of time used as a criterion to classify users is based on a classification system developed by Cooper, Putnam, Planchon, and Boies (1999). Within this classification system, low users spend one hour or less engaged in Internet sexual behavior per week, moderate users spend 2–10 hours per week, and heavy users spend more than 10 hours per week (Cooper et al., 1999; Parsons, Severino, Grov, Bimi, & Morgenstern, 2007). Thus far, the literature has not been explicit about the number of symptoms and what criteria are used in conjunction with time spent in pursuit of online sexual material to diagnose cybersexual addiction (Parsons et al., 2007). For the purposes of this dissertation, a question included in the demographics questionnaire asked the individual to

estimate the amount of time they spend engaged with Internet sexual material to better understand the range of time spent on Internet-based sexual behavior.

Types of individuals with cybersexual addiction. Researchers have distinguished between individuals who use Internet sexual material without developing an addiction and those who may suffer from cybersexual addiction. Cooper et al. (1999) identified three levels of users: recreational users, at-risk users, and cybersexual compulsives. It should be noted that Cooper (1998) defines sexual compulsion as, “an irresistible urge to perform an irrational sexual act.” Despite this difference from conceptualizing this behavior as a behavioral addiction, these terms are used interchangeably in the literature (Cooper et al. 1999). Recreational users are individuals who use Internet pornography and other online sexual material without difficulty or risk of addiction (Cooper et al. 1999). At-risk users have difficulties with cybersexual materials and behavior, but have no history of offline sexual addiction and would not have developed sexual addiction behavior had they not had access to online sexual material. Furthermore, within the categorization of at-risk users there are two subgroups: the depressed-type and the stress-reactive type. The depressive type of at-risk user limits his/her outside social interactions and becomes more withdrawn as they engage in cybersexual behavior, whereas the stress-reactive at-risk user seeks out cybersexual behavior in response to high stress but will return to healthier coping habits following the reduction of stress. Finally, cybersexual compulsives are individuals who have a history of offline problematic or unconventional sexual behavior and later develop a cybersexual compulsion (Cooper et al. 1999). The authors identified offline problematic behavior as including paraphilias, high numbers of sexual partners or affairs, and/or a preoccupation with offline pornography. While both at-risk users and cybersexual compulsives were considered to have a problem with online sexual material, the division between these two

groups may contribute to problems in diagnosing cybersexual addiction. Thus, the validation and use of specific diagnostic criteria, particularly in measure development, are important.

The authors separated these groups in order to better identify appropriate treatment options for individuals within each category. However, there is no empirical research published that examines differences between cybersexual compulsives and at-risk users both in terms of their sexual behavior and correlates of such behavior. By separating these two groups and identifying online-only users as at-risk users rather than as cybersexual compulsives, the authors appear to minimize the significance of cybersexual-only addiction behavior. The consequence of this is that individuals who may struggle with only cybersexual addiction may have their problems minimized or be missed in a measure of addiction. Further, without empirical evidence it cannot be assumed that these two groups are indeed discrete. For the purposes of this dissertation, both individuals with and without a history of offline problematic sexual behavior, but who report significant symptoms of cybersexual addiction were included in the analyses. While future research should examine the differences between these two groups, this is beyond the scope of this particular study.

Correlates of Cybersexual Addiction

There are a number of constructs that correlate with cybersexual addiction and cybersexual behavior, including shame (Gilliland, South, Carpenter, & Hardy, 2011), loneliness (Yoder, Virden, & Amin, 2005), substance use (Perera, Reece, Monahan, Billingham, & Finn, 2009), offline sexual compulsivity (Kalichman et al., 1994), sexual sensation seeking (Gullette & Lyons, 2005), masculinity (Becerra, Robinson, & Balkin, 2011), emotion regulation (Cashwell, Giordano, Lankford, & Henson, 2016; Reid, Carpenter, Spackman, & Willes, 2008), impulsivity (Raymond, Coleman, & Miner, 2003), Internet addiction (Meerkerk, Eijden, & Garrelsen, 2006),

and religiosity (Ferree, 2003; Kwee, Dominguez, & Ferrell, 2007; Laaser & Gregoire, 2003).

Examining these constructs provides researchers and clinicians with a better understanding of the contributing factors to problematic sexual behavior and cybersexual behavior, as well as what to address in treatment. Addressing the most significant correlations between several specific constructs and cybersexual addiction found in the research, this study will focus specifically on shame, loneliness, substance use, sexual compulsivity, and Internet addiction in relation to the new measure of cybersexual addiction. The other constructs, while important to understanding cybersexual addiction, do not appear to have the same impact on cybersexual behavior in the literature and are beyond the scope of this study. One such example is religiosity. Although this construct appears frequently in the literature, empirical evidence suggests that it is the role of shame (Kwee et al., 2007) and moral disapproval of pornography (Grubbs, Exline, Pargament, Hook, & Carlisle, 2015) that mediates the relationship between religiosity and the individual's perceived addiction to cybersexual material. Thus, this study will assess for shame rather than religiosity as part of the measure development process. The following sections more fully outline the correlates of cybersexual addiction that were examined in this study to better assess the validity of the new measure.

Shame. As noted above, previous research has pointed to a link between shame, defined as a negative self-focused emotion, and sexual addiction (Gilliland et al., 2011; Reid, Harper, & Anderson, 2009). Feelings of shame are a common consequence of sexual addiction; however, researchers have argued that high levels of shame in relation to individual's sexual and social behavior function as a precursor to problematic sexual behavior (Kort, 2004; Reid et al., 2009). A study by Gilliland, South, Carpenter, and Hardy (2011) was one of the first studies to assess the particular role that shame plays in sexual addiction. The authors specifically used the

definition of shame as developed by Tangney and Dearing (2002), who stated that shame is an experience of overall negative evaluation of the self, which is often brought on by a specific behavior. The researchers recruited 177 individuals (170 males, 2 females, and 5 unidentified sexes) who were receiving treatment for problematic pornography use. Individuals were recruited from both an online treatment program and outpatient mental health clinics near a private religious-affiliated university in the southwest United States. The experience of shame was measured by the shame subscale of the Test of Self Conscious Affect-Short Version (Tangney & Dearing, 2002), which asks how an individual would react in several everyday shame-inducing situations. Shame was found to be significantly positively correlated with sexual addiction behavior (Gilliland et al., 2011). Structural equation modeling (SEM) was used to determine the predictive value of shame for sexual addiction behavior. It was found that shame accounted for 33% of the variance in scores of sexual addiction behavior (Gilliland et al., 2011). The authors theorized that individuals with significant levels of shame may seek out sexual behavior to reduce their discomfort and experience of shame, which then creates a vicious cycle of shame and sexual addiction behavior (Gilliland et al., 2011).

Additional studies provided support for the correlation between shame and sexual addiction behavior (Dhuffar & Griffiths, 2014; Reid et al., 2009; Reid, Stein, & Carpenter, 2011). Reid, Harper, and Anderson (2009) conducted a survey-based study of 71 males who were recruited from a clinic specializing in the treatment of sexual addiction and 73 undergraduates recruited from a university in the Southwestern US without sexual addiction-related behavior. Shame was measured by the Compass of Shame Scale (Elison, Lennon, & Pulos, 2006), which assesses for an individual's tendency to engage in withdrawal, attack one's self, attack other people, and avoid when faced with shame-inducing situations. The researchers

found that individuals in the sexual addiction group endorsed significantly higher levels of shame compared to the undergraduate group without sexual addiction behavior (Reid et al., 2009). This provides further support for the correlation between shame and sexual addiction behavior.

Similarly, Dhuffar and Griffiths (2014) conducted a survey-based study to assess the role of shame in female hypersexual behavior. As much of the current research has been done only on males, this study is notable for its inclusion of only female participants. Researchers assessed 102 British females aged 18 and older (Dhuffar & Griffiths, 2014). The authors found that shame, as measured by the Shame Inventory (SI) which assesses for the individual's tendency to feel shame (Rizvi, 2010), was significantly positively correlated with hypersexual behaviors as measured by the Hypersexual Behavior Inventory (HBI; Dhuffar & Griffiths, 2014). The authors go on to hypothesize that individuals with high levels of shame and a higher tendency to experience shame are seeking out sexual behavior to cope. For the purposes of this study, a measure of an individual's tendency to experience shame was used to determine if the new measure is positively correlated with shame and is thus measuring the appropriate construct.

Loneliness. Researchers have found significant correlations between loneliness and both cybersexual and sexual addiction behavior (Chaney & Dew, 2003; Chaney & Burns-Wortham, 2015; DeLonga et al., 2011; Guigliano, 2006; Yoder et al., 2005). Loneliness was defined in each study as a feeling of sadness related to social isolation (Chaney & Burns-Wortham, 2015). An initial interview-based study of 13 homosexual and bisexual males ages 20 to 55 conducted by Chaney and Dew (2003) demonstrated that loneliness and a desire for social connection was positively correlated with increased rates of Internet sexual behavior. The authors of this study measured loneliness by asking semi-structured questions such as, "how connected do you feel to

the people in your life,” and, “how connected do you feel to people you meet online?” (Chaney & Dew, 2003). Guigliano (2006) conducted a similar open-ended interview study using 14 homosexual, straight, and bisexual males ages 29–64 and found that loneliness was reported by 9 different participants as a significant motivating factor for engaging in sexually compulsive behavior. These early interview studies suggest a relationship between loneliness and sexual addiction.

Empirical research has also been conducted to better assess the contribution of this construct to cybersexual behavior. In a survey study of 114 females and 286 males recruited from Internet pornography websites, researchers found that Internet pornography use significantly positively correlated with scores on a measure of loneliness (Yoder et al., 2005). The specific measure used was the University of California Los Angeles Loneliness Scale-3 (UCLALS-3), which is designed to measure subjective feelings of loneliness and social isolation (Russell, 1996). The researchers theorized that individuals who suffer from loneliness are more likely to seek out cybersexual behavior to address their social needs in addition to their sexual needs. The anonymity of the Internet allows for individuals to disclose more information about themselves than they would in-person, thus fostering a greater sense of intimacy and social connection (Cooper, 1998). DeLonga and colleagues (2011) surveyed a sample of 49 adolescent homosexual males, ages 16–19, at a Midwestern LGBTQ community center. The researchers found that loneliness, as measured by the Short Form UCLAS (Hays & DiMatteo, 1987), was positively and significantly correlated with compulsive Internet use. In addition, the researchers found that higher self-reported loneliness was associated with a greater number of sexual partners (DeLonga et al., 2011). This suggests that individuals may be seeking out both sexual behavior and Internet use to cope with feelings of loneliness. A more recent study expanded

upon this and to better understand the relationship between loneliness and sexual addiction, a sample of 305 homosexual and bisexual males aged 18–63 were recruited from a large metropolitan city to participate in a survey (Chaney & Burns-Wortham, 2015). The authors found that loneliness, as measured by the UCLALS, was significantly positively correlated with sexual compulsivity scores. Further, a regression analysis indicated that loneliness scores accounted for 10% of the variance in sexual addiction scores, indicating that males who experienced greater loneliness were more likely to engage in sexually compulsive behavior (Chaney & Burns-Wortham, 2015). While this study only examined homosexual and bisexual males, this study aims to expand upon these findings and assess for loneliness across genders.

In contrast, a single empirical study found no connection between loneliness and problematic Internet sexual behavior (Parsons et al., 2007). In this study of 183 homosexual and bisexual males ages 18–63 who all identified as sexually compulsive and met criteria for non-Internet sexual addiction, the researchers found no significant differences in self-reported loneliness between individuals engaged in low, moderate, or high amounts of Internet-based sexual behavior. However, this study is an outlier. The difference between this and the previous studies likely reflects that the previous studies examined correlations across the entire sample, and this study specifically separated out low, moderate, and high users and looked across these groups, but not at a control group. While the current study examined the correlation between loneliness and cybersexual addiction, future research examining loneliness should include comparison across types of users.

Substance use. Research has demonstrated a connection between sexual addiction and substance use. In a survey study of 211 patients seeking treatment at a substance abuse center, 25% of the patients scored positively on a measure of sexual addiction (Stavro, Rizkallah, Dinh-

Williams, Chiasson, & Potvin, 2013). Notably, the authors found that the sexual addiction group scored significantly higher on levels of cocaine abuse than the non-sexual addiction group. However, there were no differences with regard to the use of other substances. Similarly, a survey study of 539 undergraduate students from a large Midwestern university found that stimulant use significantly contributed to the variance in sexual addiction scores (Perera et al., 2009). Further, a survey-based study of 99 females, of whom 56 had been treated for sexual addiction, found significant positive correlations between sexual addiction scores and scores on measures of both alcohol and drug abuse (Opitz, Tsytsarev, & Froh, 2009). Kalichman and Cain (2004) found similar results in a survey-based study of 432 males and 193 females recruited from a public health clinic in a metropolitan Midwestern city. The authors found that higher scores on a measure of sexual addiction were associated with greater use of alcohol and other drugs, particularly while engaging in sexual behavior. Additionally, similar to the studies noted earlier, the authors found that those with higher sexual addiction scores were more likely to have used cocaine and inhalants in the previous 3 months than participants with lower sexual addiction scores (Kalichman & Cain, 2004). The treatment literature notes that individuals in 12-step groups may “addiction hop” by trading one addiction for the other, and it is not uncommon for individuals to discover they are sexually addicted after starting treatment for substance abuse (Carnes, 1983). Further, there has been more recent research regarding the concept of addiction transfer within bariatric populations finding that individuals who struggle with eating addiction will often subsequently report substance abuse concerns following bariatric surgery (Blum et al., 2011; Fowler, Ivezaj, & Saules, 2014). This suggests that the processes of substance and sexual addiction may be similar and that the behavior functions in the same way to regulate one’s emotions or to serve as a distraction from more difficult cognitive processes. Taken together, the

research on substance abuse and sexual behavior suggests that there is a positive relationship between substance use, particularly stimulant use, and sexual addiction. This dissertation included a measure of alcohol and drug use to assess for this behavior in the current sample.

Sexual compulsivity. Researchers have theorized that sexual addiction behavior is better conceptualized as compulsive sexual behavior and have noted that there is a relationship between this behavior and problematic online sexual behavior (Mick & Hollander, 2006). Compulsive sexual behavior is most often defined as “an irresistible urge to perform an irrational sexual act” (Cooper, 1998). A survey-based study of 494 males and females found that sexual compulsivity, as measured by the Sexual Compulsivity Scale (SCS; Kalichman et al., 1994), was significantly positively correlated with the number hours spent using Internet pornography (Wetterneck, Burgess, Short, Smith, & Cervantes, 2012). Further, individuals who were classified as having problematic Internet pornography use, as identified by affirmative answers to questions related to the DSM-IV-TR behavioral addiction criteria (American Psychiatric Association, 2000), scored higher on the measure of sexual compulsivity than individuals whose use was not classified as problematic (Wetterneck et al., 2012). While this points to the role of offline sexual compulsivity in cybersexual addiction behavior, this study did not measure compulsivity outside of sexual behavior. In a similar survey-based study of 1,458 males and females, researchers compared individuals who were identified as sexually compulsive to those who were identified as non-sexually compulsive using the SCS (Daneback, Ross, & Mannson, 2006). It was found that sexually compulsive individuals were 3 times more likely to spend 3–10 hours online per week and 15 times more likely to spend more than 15 hours online per week, often in pursuit of sexual material when compared to non-sexually compulsive individuals (Daneback et al., 2006). As the literature suggests a relationship between offline and online sexual addiction/compulsivity, the

SCS will be used to assess for sexual compulsivity and offline sexual addiction behavior as part of the development of the new measure.

Internet addiction. While the cross-section of Internet addiction and sex addiction is considered in the development of cybersexual addiction behaviors, there appears to be little literature specifically looking at this relationship. There is some inconsistency in the literature with some researchers having theorized that cybersexual addiction is a subset of Internet addiction (Young, 1999), whereas others suggest that the Internet is simply a medium for the practice of sex addiction (Griffiths, 2000). One study of 447 individuals collected in an online sample found a close relationship between Internet addiction and online sexual behavior (Meerkerk, Eijden, & Garrlesen, 2006). The authors specifically found that not only are the two behaviors significantly correlated but that significant time spent on online erotica predicts an increase in compulsive internet use over the course of one year, which the authors theorize is due to the sexually stimulating nature of erotica rather than the Internet specifically (Meerkerk et al., 2006). In conclusion, as the two constructs appear to be significantly intertwined, a measure of Internet addiction was included in the study to examine the predictive value and criterion validity of this construct in relation to cybersexual behavior and the new measure. While the above correlates are important to understanding cybersex addiction, it is also important to consider comorbid diagnoses that may affect treatment.

Comorbidity

Researchers have identified comorbid diagnoses associated with increased risk for cybersexual and sexual addiction, but little is known whether these disorders precede the diagnosis of sexual addiction or develop as a consequence of sexual or cybersexual addiction (Morgenstern et al., 2011; Rosenberg, Carnes, & O'Conner, 2014). Kafka and Hennen (2002)

conducted a correlational study of males with sexual addiction to examine the comorbidity of other disorders with sexual addiction and found that there were two major diagnostic categories associated with sexual addiction, depressive disorders and anxiety disorders. As such, these will be more fully outlined below.

Depression. Mood disorders, such as depression and bipolar disorders, are positively correlated with sexual addiction (Kafka & Hennen, 2002). These researchers conducted a survey study of 120 individuals with paraphilias and non-paraphilia related disorders and found that the most prevalent comorbid diagnoses were mood disorders including persistent depressive disorder and major depressive disorder (Kafka & Hennen, 2002). One study of 657 female sex and love/relationship addicted females found that researchers found that individuals who were identified as having sex addiction were significantly more likely to report depressive symptoms than females who identified as having a love/relationship addiction (Corley & Hook, 2012). Further, in a study of 183 homosexual and bisexual males who met criteria for a sexual addiction, 32.8% of the sample met criteria for a depressive disorder (Morgenstern et al., 2011). More recent research on types of Internet addiction, found that individuals who identified as having cybersex addiction reported significantly higher rates of addiction than individuals who identified as having different types of Internet addiction (Laconi, Tricard, & Chabrol, 2015). Individuals who are depressed may retreat into cybersexual behavior to regulate their emotions or to forge a social connection (Kafka & Hennen, 2002). On the other hand, it has also been theorized that depression may develop as individuals retreat into their addiction as they may struggle to form interpersonal connections outside of his/her addiction (Cooper et al., 1999; Kafka & Hennen, 2002). Due to the positive correlation between depression and sexual addiction, the current study included a measure of depression.

Anxiety. Anxiety disorders have also been found to be frequently comorbid with sexual addiction and may occur through similar processes as those described for depression (Kafka & Hennen, 2002). Specifically, individuals may seek out sexual addiction to calm the anxious feelings (Kafka & Hennen, 2002). In the same study detailed in the depression section, anxiety disorders, particularly social phobia, were the second most common comorbid diagnosis in the sample of males diagnosed with paraphilic and non-paraphilic sexual disorders (Kafka & Hennen, 2002). To better understand the role of comorbid diagnoses in sexual addiction behavior, Morgenstern and colleagues (2011) conducted a survey-based study with 183 bisexual and homosexual males who were identified as sexually addicted after scoring one standard deviation above the mean on the Sexual Compulsivity Scale (Kalichman et al., 1994). The researchers found that 65.5% of the entire sample met criteria for an Axis I disorder, and 35.2% of those with an Axis I diagnosis met criteria for an anxiety disorder (Morgenstern et al., 2011). While there have only been two studies empirically studying the comorbid diagnoses associated with sexual addiction (Kafka & Hennen, 2002; Morgenstern et al., 2011), it is still important to consider the role of these symptoms when diagnosing sexual addiction given the significant correlations in these studies. As a result this study included measures of depression and anxiety to assess for the comorbidity of symptoms with cybersexual behavior as assessed by the new measure.

Previous Assessment of Cybersexual Addiction

There are several measures that have been used to measure sexual and cybersexual addiction. At the time of this study's development, there were five cybersexual-specific addiction measures available, the Internet Sex Screening Test, the Cyberporn Compulsivity Scale, the Cyber-Pornography Use Inventory, the Cyber-Pornography Use-9, and the Internet Addiction

Testsex, and the measures are not used consistently across the literature. Of these five, one of the measures, the Cyber-Pornography Use Inventory-9, is a shortened version of the older Cyber-Pornography Use Inventory (Grubbs, Volk, Exline, & Pargament, 2015). The Sexual Compulsivity Scale (SCS; Kalichman et al., 1994), a measure of offline sexual addiction, combined with the self-report of the amount of time the individual spends with sexual material on the Internet has been the most frequent approach to measuring cybersexual behavior in the literature (Cooper et al., 2004). While this combination appears to be an effective measure of online sexual addiction, a measure specific to cybersexual addiction that is based on the proposed diagnostic criteria for both sexual addiction and Internet addiction is needed not only for effective measurement, but to provide further empirical support for the validity of this diagnosis. Each of the currently used measures are outlined below.

The Internet Sex Screening Test. The Internet Sex Screening Test (ISST) is the most frequently used cybersex-specific measure (Delmonico, 1997; Delmonico & Miller, 2003; Womack, Hook, Ramos, Davis, & Penberthy, 2013). This measure was developed to differentiate between individuals with online sexual problems, otherwise known as at-risk users, and those with compulsive online sexual behavior as described by Cooper et al. (1999). These authors identified three types of individuals with cybersexual addiction including recreational users who do not evidence any problems with Internet sexuality; at-risk users who have developed problems with cybersexual material, but do not have any difficulties with offline sexual behavior; and cybersexual compulsives who struggle with offline and online sexual addiction behavior (Cooper et al., 1999). The ISST assesses five different areas of cybersexual addiction behavior: Online Sexual Compulsivity, which refers to difficulties related to online sexual behavior such as difficulty stopping the behavior; Online Sexual Behavior-Social, which

refers to a tendency to engage in interpersonal interactions with others during online sexual behavior; Online Sexual Behavior-Isolated, which refers to the tendency to engage in solitary online sexual behavior and hide one's behavior; Online Sexual Spending, which refers to spending money in the pursuit of sexual material; and Interest in Online Sexual Behavior, which denotes more than 5 hours a week spent online in pursuit of sexual material (Delmonico & Miller, 2003).

The measure was initially validated using a sample of 14,656 males and females recruited from a website for help with sexual behavior. Individuals from this sample were identified as sexual compulsives if they scored at or above the 75th percentile, while those scoring below the 25th percentile were used as non-sexual compulsive controls (Delmonico & Miller, 2003). This resulted in a total sample of 6,088 for comparison, with 2,566 non-sexual compulsives and 3,522 sexual compulsives. Administration of the measure to this final group demonstrated that the ISST was able to discriminate between sexual compulsives and non-sexual compulsives effectively (Delmonico & Miller, 2003). The scale was reported to have adequate internal reliability with a Cronbach's alpha of .78. Each subscale also had adequate internal reliability: Online Sexual Compulsivity: $\alpha = .86$; Online Sexual Behavior-Social: $\alpha = .78$, Online Sexual Behavior-Isolated: $\alpha = .73$, Online Sexual Spending: $\alpha = .61$; Interest in Online Sexual Behavior: $\alpha = .51$ (Delmonico & Miller, 2003). No temporal stability was reported for this measure. The authors did not report divergent or convergent validity.

As noted above, there are a couple of difficulties in using this scale. First, the authors do not report the diagnostic criteria used to develop this measure. This is a concern with several measures of cybersexual and sexual addiction (Carter & Ruiz, 1996; Delmonico & Miller, 1997; Morgenstern et al., 2009; Reid, Garos, & Carpenter, 2011; Reid, Garos, & Fong, 2012). Without

a set of clear and consistently used diagnostic criteria, these measures cannot be compared effectively as they may be measuring slightly different constructs (Womack et al., 2013). In a meta-analysis of all available measures of sexual addiction, Womack et al. (2013) found that the ISST encompasses most of the proposed diagnostic criteria, but is missing questions related to criterion A2- repetitively engaging in sexual fantasies, urges, or behaviors in response to dysphoric mood states (e.g. anxiety, depression, boredom, irritability). It should be noted that no measures included Criterion C, which rules out the behavior as a result of substance use (Womack et al., 2013). While further research is needed to validate these criteria, measure development should include this as part of the process. In addition, the factor structure of this measure may not be very robust. As noted above, two of the five subscales reported adequate, but low, Cronbach's alpha, which suggests poor internal reliability. It should be noted that these two subscales contained 2- and 3-item subscales. It is possible that a greater number of items in each of these factors would have contributed to stronger internal reliability. This study aimed to develop a measure with a more robust factor structure that uses the proposed hypersexual disorder diagnostic criteria (Kafka, 2010).

The Cyberporn Compulsivity Scale. The Cyberporn Compulsivity Scale (Abell, Steenbergh, & Boivin, 2006) is a 4-item scale that was adapted from the original Sexual Compulsivity Scale (Kalichman et al., 1994). This scale measures online sexual behavior specific to Internet pornography (e.g., "It has been difficult for me to surf the Internet without the urge to seek out cyberporn locations" and "Because of cyberporn, my sexual thoughts and behaviors are causing problems in my life") and excludes behaviors such as cybersex chat room behavior and seeking out people to meet for sex online. Individuals rate their behaviors on a Likert-type scale using the anchors of 1 (not at all like me) and 5 (very much like me). The

researchers from this study reported a total Cronbach's alpha of .80 for a sample of 125 undergraduate males. No temporal stability or other statistics were reported for this measure (Abell et al., 2006).

The measure was used solely in a study of the use of Internet pornography and its relationship to religiosity. While this measure has been identified in meta-analyses examining all measures of sexual addiction (Hook, Hook, Davis, Worthington, & Penberthy, 2010; Womack et al., 2013), it has not been used outside of the original study likely due to the limited behaviors it measures. An additional issue with this measure is that it does not identify if specific diagnostic criteria were used to develop the measure and uses only Criterion B, "there is significant personal distress or impairment in social, occupational, or other important areas of functioning," of the proposed hypersexual disorder criteria (Kafka, 2010; Womack, et al., 2013). Further, and perhaps most notable, is that this measure exclusively considers pornography use rather than including other types of cybersexual behavior, such as camming or chatting. This measure was not used in this study to validate the new measure as it was used in a single study and does not encompass all areas of cybersexual behavior.

The Cyber-Pornography Use Inventory. The Cyber-Pornography Use Inventory (CPUI; Grubbs, Sessoms, Wheeler, & Volk, 2010) is a 31-item scale modeled after Delmonico and Miller's ISST (2007) and developed to measure online pornography addiction. Similar to the Cyberporn Compulsivity Scale, this measure was developed for use in a study of pornography use and religious beliefs. The original measure was normed on a population of 94 males and 51 females from a Christian university. Items are rated on a 7-point Likert-type scale anchored by strongly agree and strongly disagree, as well as always and never. This measure yields both a total score and three subscale scores. These subscales include Addictive Patterns, Guilt

Regarding Online Pornography Use, and Online Sexual Behavior-Social. While no Cronbach's alpha was reported for the total score, the three subscale scores were reported to be acceptable. No temporal reliability was reported.

There are a number of problems with this measure, including the lack of diagnostic criteria, reported statistics, and norming population. As the original measure was modeled after the Internet Sex Screening Test, which did not use specific diagnostic criteria (Delmonico & Miller, 2007; Delmonico & Griffin, 2008), no diagnostic criteria were reportedly used to develop this measure. Similar to the ISST (Delmonico, 2003), this measure is missing Criterion A2, engaging in the behavior due to dysphoric mood, of the proposed diagnostic criteria (Kafka, 2010; Womack et al., 2013). Further, the authors failed to report internal reliability for the entire scale and did not assess for temporal stability. Finally, this measure was normed on a small population of individuals from a religious university. As some research has suggested that religiosity may influence pornography use or cybersexual behavior (Levert, 2007), the measure should be cross-validated on a non-religious population prior to use with the general population.

Cyber-Pornography Use Inventory-9. A short form of the CPUI was developed by Grubbs, Volk, Exline, and Pargament in 2015. The Cyber-Pornography Use Inventory -9 contains three of the original four factors, including Access Efforts, which was modified from the Addictive Pattern Subscale; Compulsivity; and Guilt. Each subscale has three items that are rated on a 7-point Likert-type scale anchored by strongly agree and strongly disagree. Notably, the Online Sexual Behavior-Social factor was excluded as the authors wished to target online pornography use exclusively (Grubbs et al., 2015). The Efforts subscale assesses for the lengths an individual will go to in order to access online pornography, the Compulsivity subscale assesses for the individual's difficulty stopping their behavior, and the Guilt subscale assesses for

the individual's emotional distress related to their pornography use (Grubbs et al., 2015). Each subscale was significantly correlated with the subscales from the original example. Notably, the authors performed three separate studies to assess for the validity using undergraduate, general population, and clinical samples. Each sample consisted of the following: undergraduate sample contained 227 males and 41 females from a private university in the Midwest; general population contained 136 males, 74 females, 3 transgendered, and 1 unreported gender recruited from Amazon's Mechanical Turk website; the clinical sample contained 103 males and 49 females recruited from the counseling center at the aforementioned university. All three studies found adequate psychometric properties and a good fit for a three-factor solution (Grubbs et al., 2015).

The CPUI-9 addressed some of the concerns with the original CPUI, including targeting online pornography use only and limited validation samples. However, this measure presents some concerns as well. While the measure is significantly correlated with the Sexual Compulsivity Scale (Kalichman et al., 1994) in both the general population and clinical sample, the correlations range from .28 to .51 (Grubbs, Exline, & Pargament, 2015). The range indicates reasonable moderate to large correlations, but the clinical sample consistently evidenced lower correlations between the CPUI-9 factors and the SCS (Grubbs et al., 2015). This suggests that the two measures are assessing significantly different constructs related to sexual addiction.

Additionally, similar to the CPUI-9, the measure only targets online pornography use and excludes the other types of online sexual behavior that individuals may be engaged in and have problematic relationships with. As the CPUI-9 has been cross-validated on a number of samples with adequate results and is the most updated measure, it will be used in the current study.

The Internet Addiction Test_{sex}. The final cybersexual-specific scale is the Internet Addiction Test_{sex} (IAT_{sex}), which is a 20-item scale modified from the Internet Addiction Test

(Brand et al., 2011). Individuals rate their behaviors on a 5-point Likert-type scale yielding a total score on Internet sex addiction ranging from never to always. The researchers reported a Cronbach's alpha of .84 for the entire scale, as measured in a sample of 89 heterosexual males, but no temporal stability score was reported (Brand et al., 2011). Similar to the other scales, this particular scale was developed for use in a single study.

As this measure was modified from the Internet Addiction Test, it effectively captures the Internet-related concerns of cybersexual addiction. However, similar to the other measures, it does not identify which diagnostic criteria for sexual addiction were used. This IAT_{sex} is missing items that assess for criteria A3, "repetitively engaging in sexual fantasies, urges, or behaviors in response to stressful life events," and A5, "repetitively engaging in sexual behaviors while disregarding the risk for physical or emotional harm to self or others" (Kakfa, 2010; Womack et al., 2013). The limited psychometrics reported for this measure does not support its widespread use in studies of cybersexual addiction. However, it was used in this study in order to determine convergent validity of the new measure.

The Sexual Compulsivity Scale. The Sexual Compulsivity Scale (SCS; Kalichman et al., 1994) is the most frequently cited measure of self-report rating scales in both the sexual addiction and cybersexual addiction literature. The SCS is a 10-item scale that yields a total score. Items are rated on a 4-point Likert-type scale ranging from 1 (not at all like me) to 4 (very much like me). According to Kalichman and colleagues (1994), a score of 24 points or higher indicates sexual addiction problems. In the cybersexual addiction literature, this measure has been used to assess for online sexual behavior problems when combined with time spent online in pursuit of sexual material (Cooper et al., 1999; Daneback et al., 2006; Perry, Accordino, & Hewes, 2007).

The authors reported satisfactory psychometric properties (Kalichman et al., 1994). The SCS demonstrated good discriminant validity and was able to differentiate between sexually compulsive individuals with high and low risk for HIV infection (Kalichman et al., 1994). While the items of this scale were developed to be nonspecific to sexual orientation, this measure was normed using a group of homosexual males. It has been used successfully with heterosexual individuals (Cooper et al., 1999; Daneback et al., 2006; Perry et al., 2007) suggesting that this is a valid measure of sexual addiction. A number of studies have reported on psychometric properties for the SCS (Cooper et al., 1999; Daneback et al., 2006; Perry et al., 2007). The use of this measure in other studies and reported psychometrics provides additional support for its research utility.

The main concern with this measure is that it does not specifically measure cybersexual behavior. Rather, the measure asks questions about general sexual appetite concerns (e.g., “I think about sex more than I would like to,” or, “it has been difficult for me to find sex partners who desire having sex as much as I do”). A measure of cybersexual addiction should more specifically measure behaviors related to the Internet and computer aspects of this behavior, including clearing browsing history, searching for specific material, and hiding one’s computer monitor from partners or roommates. Further, the original studies do not report which diagnostic criteria were used to conceptualize sexual compulsivity. Thus, this study aims to expand upon this measure and its use by developing a measure of cybersexual behavior using Kafka’s (2010) proposed hypersexual disorder diagnostic criteria.

Overview of the Current Study

It is estimated that 4% of Internet content consists of pornography; however, that 4% means that 42,337 of the top million trafficked websites in 2010 were sexually explicit (Ruvolo,

2011). Cybersexual material is easy to access, often inexpensive or free, and a pleasurable activity that can place people at risk for cybersexual addiction. Numbers for this diagnosis are not currently available; however, the literature in the area continues to grow. While there are currently five measures available to assess this particular behavior, none of the authors have explicitly used specific diagnostic criteria in measure development. For sexual addiction and cybersexual addiction to be considered for inclusion in the Diagnostic and Statistical Manual, measurement of such diagnoses must be based on the proposed criteria. In a meta-analysis, it was noted that the four main measures of cybersexual behavior were not assessing one or more of the proposed criteria (Womack et al., 2013). While these measures can still be used in research, to fully encompass cybersexual addiction, a clinical measure should include all of the available criteria to limit misdiagnosing an individual. This study aimed to develop a measure of cybersexual addiction using the DSM-5 proposed hypersexual disorder diagnostic criteria (Kafka, 2010).

As noted above, research has demonstrated that cybersexual addiction is correlated with a number of individual characteristics. These include shame (Gilliland et al., 2011), loneliness (Yoder et al., 2005), substance use (Perera et al., 2009), sexual compulsivity (Kalichman et al., 1994), and Internet addiction (Meerkerk et al., 2006). Each of the constructs correlates with sexual addiction or cybersexual addiction behavior. Thus, measures of these correlates were included in the study as a way to validate the construct of cybersexual addiction as measured by the new measure.

Further, research has noted significant comorbidities between the diagnosis of sexually addictive behavior and diagnoses of depressive and anxiety disorders (Kafka & Hennen, 2002). Specifically, higher rates of depressive disorder and anxiety disorders have been reported for

individuals seeking treatment for sexual addiction concerns (Kafka & Hennen, 2002). It has been suggested that individuals with such symptoms may seek out cybersexual behavior as a way to reduce symptoms of depression and anxiety (Kafka & Hennen, 2002). Due to the high rates of these diagnoses in cybersexually-addicted groups, individuals who reported depressive or anxiety symptoms were not excluded from the study.

In summary, the current study had three primary goals. The first was to develop a new measure of cybersexual behavior to be used both in research and by clinicians looking to determine if a client meets criteria for a cybersexual addiction. Second, the study aimed to better understand the correlates of this diagnosis, including shame, loneliness, substance use, sexual compulsivity, depression, and anxiety. Third, the current research aimed to use the measure to determine the predictive value of each correlate in relation to cybersexual addiction. Data were collected in three phases utilizing the responses of two samples of university students and a third sample of people from the broader general population. This approach was adopted in order to validate, and then cross-validate, the proposed measure for use with a wide range of people in the general population.

Hypotheses

1. It was hypothesized that the new measure of cybersexual addiction, Problematic Cybersexual Behavior Scale (PCBS), would have better internal consistency and a more robust factor analytic structure than traditional measures of cybersexual addiction. Specifically, the PCBS was compared to the Internet Sex Screening Test (ISST), the Cyber-Pornography Use Inventory-9 (CPUI-9), and the Internet Addiction Test_{sex} (IAT_{sex}).

2. It was hypothesized that the new measure of cybersexual addiction would have greater criterion validity than the traditional measures of cybersexual addiction. Specifically, it was hypothesized that the total score would better correlate with constructs associated with cybersexual addiction.
 - a. Shame, defined as a negative self-focused emotion, is positively associated with cybersexual behavior and researchers have suggested that high levels of internal shame may contribute to cybersexual behavior (Gilliland et al., 2011; Kort, 2004). It is hypothesized that a measure of shame would be positively correlated with cybersexual behavior.
 - b. Researchers have demonstrated that loneliness, defined as a feeling of sadness associated with social isolation, significantly contributes to cybersexual behavior (Chaney & Dew, 2003; Yoder et al., 2005). It was hypothesized that loneliness would be positively correlated with cybersexual behavior.
 - c. Substance use is significantly correlated with cybersexual and offline sexual behavior (Stavro et al., 2013). It was hypothesized that general substance use would be positively correlated with cybersexual behavior.
 - d. Based on the research that suggests high rates of offline sexual compulsivity among individuals with cybersexual addiction (Daneback et al., 2006), it was hypothesized that offline sexual compulsivity, as measured by the SCS, would be significantly positively correlated with levels of cybersexual behavior.
 - e. Based on previous research that demonstrates significant comorbidity between depressive disorders and cybersexual addiction (Kafka & Hennen, 2002), it was

hypothesized that higher self-reported levels of depression would be positively correlated with levels of cybersexual behavior.

- f. Based on previous research that suggests significant comorbidity between anxiety disorders and cybersexual addiction (Kafka & Hennen, 2002), it was hypothesized that greater self-reported symptoms of anxiety would be positively correlated with higher levels of self-reported cybersexual behavior.
3. It was hypothesized that shame, loneliness, sexual compulsivity, substance use, depression, and anxiety will each significantly predict cybersexual behavior.
 - a. Based on the previous research which states that levels of shame statistically predicts sexual addiction behavior (Dhuffar & Griffiths, 2014), it was hypothesized that shame would positively predict cybersexual addiction behavior in this sample.
 - b. Based on previous research that suggests loneliness is significantly positively correlated with cybersexual and offline sexual behavior (Chaney & Burns-Wortham, 2015; Yoder et al., 2005), it was hypothesized that levels of perceived loneliness would positively predict cybersexual addiction behavior in this sample.
 - c. Based on previous research that offline sexual compulsivity is significantly correlated with cybersexual behavior (Daneback et al., 2006; Mick & Hollander, 2006; Wetterneck et al., 2012) and theoretical literature that designates cybersexual compulsives as those who have a history of offline sexual addiction behavior (Cooper et al., 1999) it was hypothesized that offline sexual compulsivity, as measured by the SCS, would positively predict cybersexual addiction behavior.

- d. Based on the research which suggests that substance use is significantly positively correlated with sexual addiction behavior (Perera et al., 2009; Stavro et al., 2013), it was hypothesized that substance use scores would significantly positively predict cybersexual addiction behavior.
- e. Based on the research that suggests significant positive correlations between depressive disorders and sexual addiction behavior (Kafka & Hennen, 2002), it was hypothesized that scores on a measure of depression would significantly positively predict cybersexual behavior.
- f. Based on the previous research that suggests a significant positive correlation between anxiety disorders and sexual addiction behaviors (Kafka & Hennen, 2002), it was hypothesized that scores on a measure of depression would significantly positively predict cybersexual behavior.
- g. Due to the limited research, no a priori hypotheses were made about the differences in predictive strength of these correlates. However, analyses were conducted to compare the different regression models.

Methods

Sample Characteristics

Phase One. Phase One participants were 330 students at Eastern Michigan University. Four hundred participants were recruited for the first phase of the study; however, following closure of the study link only 330 individuals had fully completed the measure. Individuals in Phase One reported an average of 1.31 hours of online sexual behavior each week. See Table 3 for a breakdown of all Phase One participant characteristics.

Table 3

Phase One Sample Demographics

Age	N	%
18–19	177	53.63
20–25	120	36.36
26–29	15	4.5
30–39	8	3.9
40–49	1	.9
Unknown	2	.6
Gender		
Male	107	32.4
Female	217	65.8
Transgender (FTM)	1	.3
Transgender (MTF)	1	.3
Other (non-binary, genderqueer, self-identified FTM)	6	1.2
Ethnicity		
White	218	66.1
Hispanic or Latino	22	6.7
Black or African American	92	27.9
Native American or American Indian	8	2.4
Asian or Asian American	11	3.3
Pacific Islander	2	.6
Middle Eastern	7	2.1

Table 3 continued

Ethnicity		
Other	3	.9
Sexual Orientation		
Heterosexual	276	83.6
Homosexual	12	3.6
Bisexual	29	8.8
Queer	7	2.1
Other (heteroflexible, pansexual)	6	1.8
Religious Preference		
Christian (Catholic, Protestant, Mormon, etc.)	183	55.5
Muslim	8	2.4
Buddhist	1	.3
Spiritual	23	7.0
Other	16	4.8
Not Applicable	98	29.7
Education (in years)		
12	75	22.7
13	69	20.9
14	67	20.3
15	60	18.2
16	31	9.4
17	14	4.2

Table 3 continued

Age		
18+	14	4.2
Relationship Status		
Single	180	54.5
In a relationship	119	36.1
Married	14	4.2
Divorced	1	.3
Remarried	1	.3
Living with partner	13	3.9
Other (Complicated, Friends with benefits)	2	.6

Phase Two. Phase Two participants were 408 students at Eastern Michigan University. Individuals in Phase Two reported an average of 1.35 hours of online sexual behavior per week. See Table 4 for a breakdown of all Phase Two participant characteristics.

Table 4

Phase Two Sample Demographics

Age	N	%
18–19	188	46.0
20–24	68	41.6
25–29	34	8.3
30–39	14	3.4
40–49	6	1.4
51+	1	.2
Gender		
Male	163	39.5
Female	243	58.8
Transgender (FTM)	4	1.0
Transgender (MTF)	1	.2
Other (genderfluid)	2	.5
Ethnicity		
White	260	63.0
Hispanic or Latino	31	7.5
Black or African American	110	26.6
Native American or American Indian	4	1.0
Asian	18	4.4
Pacific Islander	3	.7
Middle Eastern	16	3.9

Table 4 continued

Ethnicity		
Other	7	1.7
Sexual Orientation		
Heterosexual	345	83.5
Homosexual	9	2.2
Bisexual	42	10.2
Queer	9	2.2
Other (heteroflexible, pan-romantic/demisexual, pansexual)	8	1.9
Religious Preference		
Christian (Catholic, Protestant, Mormon, etc.)	233	56.4
Muslim	14	3.4
Jewish	4	1.0
Buddhist	1	.2
Hindu	4	1.0
Spiritual	27	6.5
Other	11	2.7
Not Applicable	119	28.8
Education (in years)		
10–11	3	.7
12	64	15.6
13	86	21.0

Table 4 continued

Education (in years)		
14	93	22.7
15	73	17.8
16	53	13.0
17	17	4.2
18+	20	4.9
Relationship Status		
Single	196	47.5
In a relationship	170	41.2
Married	12	2.9
Divorced	5	1.2
Living with partner	21	5.1
Other (complicated, friends with benefits)	9	2.2

Phase three. Phase Three participants were recruited from Amazon's Mechanical Turk and consisted of 386 individuals. Individuals in Phase Three reported an average of 1.68 hours of online sexual behavior each week. See Table 5 for a breakdown of all Phase Three participant characteristics.

Table 5

Phase Three Sample Demographics

Age	N	%
18–19	9	2.3
20–24	5	1.3
25–29	105	27.2
30–35	66	17.0
35–39	47	12.1
40–49	49	12.6
50–59	16	4.1
60–65	7	1.8
70+	2	.5
Gender		
Male	257	66.8
Female	123	31.9
Transgender (FTM)	3	.8
Other (non-binary, gender queer)	2	.5
Ethnicity		
White	254	66.0
Hispanic or Latino	40	10.4
Black or African American	30	7.8
Native American or American Indian	9	2.3
Asian or Asian American	71	18.4

Table 5 continued

Ethnicity		
Other	31	.3
Sexual Orientation		
Heterosexual	316	82.1
Homosexual	21	5.5
Bisexual	43	11.2
Queer	4	1.0
Other (Heteroflexible, Pansexual)	1	.3
Religious Preference		
Christian (Catholic, Protestant, Mormon, etc.)	134	34.8
Muslim	10	2.6
Jewish	7	1.8
Buddhist	1	.3
Hindu	46	11.9
Spiritual	32	8.3
Other	16	4.2
Not Applicable	139	36.1
Education (in years)		
10	2	.5
11	2	.5
12	43	11.2

Table 5

Education (in years)		
13	25	6.5
14	64	16.6
15	40	10.4
16	128	33.2
17	18	4.7
18+	60	15.5
Relationship Status		
Single	127	33.0
In a relationship	83	21.6
Married	134	34.8
Divorced	13	3.4
Remarried	2	.5
Living with partner	24	6.2
Other (complicated, friends with benefits)	2	.5

We recruited individuals for Phases One and Two by sending e-mails to course instructors and speaking in various undergraduate classes that offer extra credit for research participation. The study was available through the SONA system, an online research study database for EMU students. See Appendix A for the in-class and SONA system announcements. Individuals recruited through the in-class announcements were be directed to the SONA system

to gain access to the study. Participants who completed the study were offered extra credit at the discretion of their psychology professor.

Phase Three participants were recruited by the primary investigator from the general community. Participants were recruited from the national community from the website *Mechanical Turk (MTurk)*. *MTurk* is owned by Amazon and is used to recruit individuals to complete work tasks for a small payment. *MTurk* participants have been found to be equally split across genders and a greater number of participants using this site were non-White identified than a generic Internet sample (Gosling, Vazire, Srivastava, & John, 2004). Participants were offered \$1.00 for their completion of the study. This is supported by a study of *MTurk* participation rates, which found that compensation of 50 cents for completion of a 30-minute survey provided the best rate of responses when compared to lower amounts (Buhrmester, Kwang, & Gosling, 2011). As the current study took approximately 1 hour, \$1.00 was an appropriate amount. In addition, this amount is consistent with the amount offered for a number of other tasks currently posted on the site (<http://www.mturk.com>). The direct link to the study was posted in an announcement on this site. See Appendix B for the announcement.

Prior to completing the survey, participants were asked to read and sign the informed consent. The informed consent form detailed the sexual nature of the questions in the study and the participant's right to leave the study at any point without consequence. See Appendix C for the EMU consent form and Appendix D for the *MTurk* consent form.

The data were kept confidential and secure. Individuals were not required to enter their name in order to consent to the study and no other identifying information was connected to the data. All data were kept in a password-protected computer in a secure lab space to ensure confidentiality.

Procedure

Participants were directed to an online survey (hosted on <http://www.surveymonkey.com>). Interested individuals first read and signed an online consent form approved by the EMU Human Subjects Review Committee. See Appendix E. Individuals who did not sign this consent form or declined to participate were sent to a thank you page and did not complete the survey. Inclusionary criteria consisted of being 18 years old or older and having viewed online pornography or engaged in other online sexual behavior at least once in the last 6 months. This requirement was established in order to rule out individuals who do not currently or who have never used online sexual material, as their report was likely to be significantly different than those of non-compulsive online sexual material users to parallel other research (Abell et al., 2006; Brand et al., 2011; Delmonico & Miller, 1997; Grubbs et al., 2010).

For the second and third component of the study, interested individuals followed the same procedures as in Phase One described above. Phase Two participants were recruited from the EMU undergraduate population and Phase Three participants were recruited from the Mechanical Turk website. Upon completion of this survey, participants were sent to a separate survey in order to record their participation in order for credit to be granted and subsequently to a thank you page.

Measures

The following measures were administered to participants in this order. Measures were chosen based both on their psychometric properties and their use in the cybersexual addiction literature.

Demographic questionnaire. Demographic information collected included age, gender, ethnicity, sexual orientation, religious orientation, years of education, current marital status, and

current employment status. The number of hours the person spends engaged with online sexual material each week was also requested. See Appendix F.

Problematic Cybersexual Behavior Scale (new measure). The Problematic Cybersexual Behavior Scale (PCBS) was the new measure developed for this study. The proposed PCBS was a 52-item measure aimed at examining cybersexual addiction in the different forms including pornography viewing, web-cam behavior (camming), using the Internet to meet people for offline sexual purposes, and cybersexual chat room/instant messaging behavior. There were two proposed reverse scored items. Items were rated on a Likert type scale ranging from 1 (not at all like me) to 5 (very much like me). Total scores were summed with higher scores indicating greater cybersexual addiction behavior. The new measure aimed to improve upon the previous measures by examining a broader range of possible cybersexual behaviors, as well as including measure items related to the proposed hypersexual disorder diagnostic criteria (Kafka, 2010). Criterion C was excluded, as it is a specific rule out for the behavior being caused by substance use or medication and has not been included in any other measure of cybersexual behavior. Items were modified from the CPUI-9, ISST, IAT_{sex}, and SCS with additional items developed from discussions with Dr. David Delmonico and Dr. Fred Volk. Items from the other measures were included if they mapped onto one of the diagnostic criteria and were consistent across the four measures and were subsequently modified to be inclusive of all cybersexual behavior.

The current measure was assessed for reliability and validity in Phases One, Two, and Three of the study. I hypothesized that the internal consistency of all the subscales, along with the total scale would demonstrate good reliability above $r = .60$. This is an adequate reliability for scales used in research (Dekovic, Janssens, & Gerris, 1991). An analysis of reliability when

individual items are removed from the factor analysis was conducted to see if any individual item affects the reliability. Items that reduce the reliability were to be removed from the factor analysis and future analyses. Reliability statistics for the measure are included in the results section and were conducted following the exploratory factor analysis on all samples.

It was hypothesized that a factor analysis of the items would produce a five-factor structure. Specifically, these factors were hypothesized to be time consumed with sexual behavior, engagement in behavior due to distress, attempts to stop, disregard for safety and escalation, and consequences of behavior. The time consumed factor was designed to assess for the individual's amount of time spent online in pursuit of sexual material interfering in their daily life and is related to Criterion A1 of the proposed criteria (Kafka, 2010). For example, one item states "I have missed a deadline at work or school due to my online sexual behavior," while another state, "I find myself thinking about online sexual material while at work." The engagement in behavior due to distress specifically asked questions about the individual's motivation for the online sexual behavior. This is specifically related to criteria A2 and A3 (Kafka, 2010). Items in this factor included "I find myself looking for online sexual material when I feel sad" and "when I am stressed, I often engage in online sexual behavior." The third factor, attempts to stop and escalation, is focused on compulsivity, and attempts to control the behavior. This is a factor that was suggested for inclusion by both Dr. David Delmonico and Dr. Fred Volk, based on their previous work with cybersexual behavior. This factor specifically targets Criterion A4. The factor included items such as "I struggle to control my sexual thoughts and behaviors" and "I have punished myself after using the Internet for pornography or other sexual activity (e.g., Time out from computer, cancelling my Internet subscription, mentally berating myself)." Disregard for safety is the fifth factor and was developed to address Criterion

A5 and escalation of behavior. This factor aimed to assess for behavior such as using one's real name, meeting up with people offline, and watching more "hardcore" forms of pornography.

Items specific to this factor include "I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable" and "I have continued to use online sexual material even after a significant other asked me to stop." The final factor aimed to assess for consequences associated with Criterion B, which specifies consequences of the online sexual behavior in social, occupational, and other important areas of the individual's life. Example items for this factor include "I feel sick after engaging in online sexual behavior" and "online sexual behavior has caused me problems at work (e.g., lost a job, called off sick in order to be online)." These factors were hypothesized to appear in both the initial validation sample and in the larger sample of combined Phases Two and Three accessed from both the university and the national population. We planned to begin to establish construct validity if the factor structure was the same across the three sample populations. Table 6 contains all proposed items with information about the origins of the items. See Appendix G for original measure.

Table 6

Problematic Cybersexual Behavior Scale (PCBS) Items and Origins.

<u>Factor and Item</u>	<u>Origins</u>
Time Consumed	
I have stayed up past when I wanted to in order to access online sexual material.	Modified from CPUI (Grubbs et al., 2010); <i>IATsex</i> (Brand et al., 2011); ISST (Delmonico & Miller, 2003)
I have missed a deadline at work or school because of my online sexual behavior.	Modified from <i>IATsex</i>
I sometimes fail to meet my commitments or responsibilities because of my online sexual behavior.	Modified from <i>IATsex</i> ; SCS (Kalichman et al., 1994)
I find myself searching for online sexual material while at work or school.	Modified from SCS
I have procrastinated on my work or other responsibilities so that I could pursue online sexual material or behavior.	Modified from CPUI
I have declined invitations to be with friends or attend social functions in order to spend more time online in pursuit of sexual material.	Modified from CPUI and <i>IATsex</i>
I have changed my schedule in order to be home alone to view online sexual material.	Modified from CPUI
I have waited until my roommate or significant other is not around to seek out sexual material online.	Modified from CPUI
I spend more time on the Internet engaged with sexual material than I would like to.	Modified from <i>IATsex</i>
Seeking Out in Response to Distress	

I find myself seeking out online sexual material when I feel sad.	Modified from <i>IATsex</i>
I find myself seeking out online sexual material when I feel anxious.	Based on proposed hypersexual disorder diagnostic criteria (Kafka, 2010)
I find myself seeking out online sexual material when I am worried.	Based on proposed hypersexual disorder diagnostic criteria
I find myself seeking out online sexual material when I am bored.	Based on proposed hypersexual disorder diagnostic criteria
I have used online sexual materials as a way to cope with feeling bad.	Modified from <i>IATsex</i>
I only look at online sexual material when I am in a good mood. {r}	Based on proposed hypersexual disorder diagnostic criteria
I find myself looking at online sexual material after I have had a difficult day.	Modified from <i>IATsex</i>
I find myself engaged in online sexual behavior after something stressful has happened in my life (ex. Failing a test, fight with partner, bad review at work).	Based on proposed hypersexual disorder diagnostic criteria
Viewing online sexual material or engaging in online sexual behavior helps me to cope with stress.	Based on proposed hypersexual disorder diagnostic criteria
When I am stressed, I often engage in online sexual behavior.	Based on proposed hypersexual disorder diagnostic criteria
Attempts to Stop	
I have punished myself after using the Internet for pornography or other sexual activity (ex. Time out from computer, cancelling my Internet subscription, mentally berating myself).	Modified from ISST (Delmonico & Miller, 2003)

I have tried to stop using the Internet for online sexual material or behavior.	Modified from ISST
I have made promises to others to stop using the Internet for online sexual material or behavior.	Based on proposed hypersexual disorder diagnostic criteria
I struggle to control my sexual thoughts and behaviors.	Modified from SCS
I have little to no difficulty controlling my online sexual behavior. {r}	Modified from CPUI and SCS
I have tried to block specific sexually explicit websites in order to prevent myself from using them.	Based on proposed hypersexual disorder diagnostic criteria and per discussion with Dr. Delmonico
I have unsubscribed from sexually explicit websites to avoid using them.	Based on proposed hypersexual disorder diagnostic criteria and per discussion with Dr. Delmonico
I find myself engaged in online sexual behavior even when I had tried to avoid it.	Modified from CPUI
Escalation & Compulsivity	
I have increased the risks I take online to access sexual material (ex. Using my real name, giving out my phone number).	Modified from ISST and per discussion with Dr. Volk
I have given out my real name online to someone for sexual purposes.	Modified from ISST
I have posted sexual material of myself online.	Modified from ISST
I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable.	Modified from ISST
	Modified from ISST

I have continued to use online sexual material even though I know it is getting in the way of my life.	
If I do not have access to online sexual material, I feel anxious, upset, or angry.	Modified from ISST; Based on Proposed Internet Addiction Criteria (Tao et al., 2011)
I am engaging in riskier online sexual behavior than I was when I first started.	Based on proposed hypersexual disorder diagnostic criteria and per discussion with Dr. Volk
I have had to start looking for more intense or hardcore material in order to orgasm.	Based on proposed hypersexual disorder diagnostic criteria
I have spent more money than planned on online sexual material or behavior.	Modified from ISST
I have paid money to gain access to online sexual material.	Modified from ISST
I have continued to use online sexual material even after someone expressed concern.	Based on proposed hypersexual disorder diagnostic criteria
I have gone out of my way to access online sexual material (e.g. using a specific e-mail address, clearing browser history, having a secondary computer).	Modified from ISST and per discussion with Dr. Delmonico
I have continued to use online sexual material even after a significant other asked me to stop.	Based on proposed hypersexual disorder diagnostic criteria
I have searched for online sexual material from a public location (e.g. work, library, Internet café).	Modified from ISST
I have signed up for an account on a sexually explicit website.	Modified from ISST and per discussion with Dr. Delmonico

Consequences

I feel sick after engaging in online sexual behavior.	Based on proposed hypersexual disorder diagnostic criteria
I am disgusted with myself and my online sexual behavior.	Based on proposed hypersexual disorder diagnostic criteria
I feel ashamed after engaging in online sexual behavior.	Based on proposed hypersexual disorder diagnostic criteria
I worry about what my partner or roommate might say if they saw the amount of sexual material I pursue online.	Based on proposed hypersexual disorder diagnostic criteria
Online sexual behavior has interfered with my life.	Modified from SCS and ISST
I am spending more money on online sexual material or behavior than I can afford.	Modified from ISST
Online sexual behavior has negatively affected my friendships.	Based on proposed hypersexual disorder diagnostic criteria
Online sexual behavior has affected my romantic relationships.	Based on proposed hypersexual disorder diagnostic criteria
Online sexual behavior has made it difficult for me to have a romantic relationship.	Modified from SCS and <i>IATsex</i>
Online sexual behavior has caused me problems at work (e.g. lost a job, called off sick in order to be online).	Based on proposed hypersexual disorder diagnostic criteria

Internet Sex Screening Test. The Internet Sex Screening Test (Delmonico, 1997) is a 25-item scale that measures cybersexual addiction. See Appendix H. The individual ranks items true or false and higher scores are indicative of greater likelihood of cybersexual addiction. The measure yields a total score and subscale scores for the following subscales: Online Sexual Compulsivity, Online Sexual Behavior-Social, Online Sexual Behavior-Isolated, Online Sexual

Spending, and Interest in Online Sexual Behavior. The total measure was correlated with the PCBS and a correlation matrix was formed with the PCBS subscales and the ISST subscales. It was expected that the online sexual compulsivity subscale would correlate with the disregard for safety and the time spent subscales of the PCBS. Due to the differing nature of the other subscales of the ISST, it was unclear how those would correlate with the PCBS.

The authors reported adequate psychometrics for the measure. The total scale was reported to have adequate internal reliability with a Cronbach's alpha of .78. Each subscale also had adequate internal reliability; Online Sexual Compulsivity: $\alpha = .86$, Online Sexual Behavior-Social: $\alpha = .78$, Online Sexual Behavior-Isolated: $\alpha = .73$, Online Sexual Spending: $\alpha = .61$, Interest in Online Sexual Behavior: $\alpha = .51$. No temporal stability was reported for this measure. The authors did not report divergent and convergent validity. For the current study, the total scale internal reliability was reported to be $\alpha = .84-.85$.

The Cyber-Pornography Use Inventory-9. In order to assess the validity of the new measure, the current study correlated the PCBS with the Cyber-Pornography Use Inventory-9 (CPUI-9; Grubbs et al., 2015). See Appendix I. The CPUI-9 is a 9-item scale that measures online pornography use behavior. Items are rated on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (extremely). Higher scores indicate greater use and difficulty with Internet pornography. There are no reverse scored items. The CPUI yields a total score and three subscale scores. These subscales are efforts, compulsivity, and guilt. The total measure was correlated with the PCBS and a correlation matrix was formed with the PCBS subscales and the CPUI-9 subscales. It was expected that the efforts subscale was correlated with the time consumed, attempts to stop, and escalation subscales of the PCBS and the guilt subscale would correlate with consequences subscale.

The authors of the CPUI-9 reported adequate psychometric information. Cronbach's alpha was reported for the total scale and each of the subscales for all three samples: total scale $\alpha = .75-.81$; efforts $\alpha = .75-.81$; guilt $\alpha = .81-.89$; compulsivity $\alpha = .74-.83$ (Grubbs et al., 2015). Convergent validity with the Sexual Compulsivity Scale (Kalichman et al., 1994) was reported to be between $r = .28$ and $r = .51$ (Grubbs et al., 2015). No other psychometric information was reported. For the current study, Cronbach's alpha was found to be adequate: total scale $\alpha = .85-.92$, efforts $\alpha = .75-.83$, guilt $\alpha = .88-.89$, compulsivity $\alpha = .86-.91$.

Internet Addiction Testsex. The Internet Addiction Testsex (*IATsex*; Brand et al., 2011) is a 20-item scale that was modified from the original Internet Addiction Test. See Appendix J. Items are rated on a 5-point Likert-type scale ranging from 1 (rarely) to 5 (always). The measure yields a total score, with higher scores indicating a greater likelihood of cybersexual addiction. The authors reported adequate internal reliability of $\alpha = .84$ (Brand et al., 2011). No other psychometric information was reported. For the current study samples, Cronbach's alpha for the total scale was found to be $\alpha = .94-.96$.

Sexual Compulsivity Scale. The Sexual Compulsivity Scale (SCS; Kalichman et al., 1994) was used in the current study to assess for non-Internet related sexual addiction behavior/sexual compulsivity. See Appendix K. The SCS is a 10-item scale that yields a total score. Items are rated on a 4-point Likert-type scale ranging from 1 (not at all like me) to 4 (very much like me). According to Kalichman and colleagues (1994), a score of 24 points or higher indicates sexual addiction problems. The total scale score was correlated with the total scale score of the PCBS to assess for validity of the PCBS. In addition, it was used to assess whether individuals who experience cybersexual addiction are also experiencing sexual addiction behaviors offline.

A number of studies have reported on psychometric properties for the SCS (Hook et al., 2010). Internal validity ranges from a Cronbach's alpha of .59 to .92. Temporal stability at 2 weeks has been reported to be $r = .95$ and $r = .64-.80$ at 3 months (Hook et al., 2010; Kalichman et al., 1994). Cronbach's alpha for the current study was found to be $\alpha = .86-.87$.

Shame Inventory. To assess for the experience of shame the Shame Inventory (Rizvi, 2010) was administered to all participants. See Appendix L. The Shame Inventory (SI) is a 53-item measure. The first three items assess for the frequency, intensity, and negative effects of shame the individual experiences on a daily basis (Rizvi, 2010). These items are rated on a scale of 0–4 with 0 (never) and 4 (always). For example, item 2 states, “circle the number which indicates the *intensity* or *severity* of shame that you typically experience.” Each following item presents a situational cue for shame and asks participants to rate the intensity of their experience of shame. Items are rated on a 5-point Likert-type scale of 0 (no shame) to 4 (extreme shame). Example of such items include “knew someone talked badly about me behind my back” and “was slow to learn something.” The total score summed and the average score is calculated, with a 4 indicating greater degrees of shame.

The author reported adequate psychometrics for the Shame Inventory (Rizvi, 2010). Cronbach's alpha was .84 for the entire measure, indicating good internal consistency. The two subparts also evidenced good internal reliability with the initial three questions $\alpha = .80$ and the situational cues had $\alpha = .83$. A correlation of $r = .50, p < .001$ was reported between the SI and the Test of Self Conscious Affect shame subscale was reported (Tangney, Wagner, & Gramzow, 1989; Rizvi, 2010). In addition, the SI and the Personal Feelings Questionnaire-Shame subscale (Harder & Lewis, 1987) had a reported correlation of $r = .37, p < .001$ (Rizvi, 2010). These correlations demonstrate adequate convergent validity. A second study was conducted to

demonstrate a good test-retest reliability over one week of $r = .85, p < .001$ (Rizvi, 2010). The reported Cronbach's alpha for the current samples was $\alpha = .94$.

UCLA Loneliness Scale. The UCLA Loneliness Scale (Russel, Peplau, & Ferguson, 1978) was used to measure participant's self-reported levels of loneliness and to assess how it correlated with cybersexual behavior. See Appendix M. The UCLA Loneliness Scale is a 20-item measure (Russell et al., 1978). Items are scored on a Likert-type scale ranging from N (I never feel this way) = 0 to O (I often feel this way) = 3. Items are summed with higher scores indicating greater experience of loneliness. This scale had a reported Cronbach's alpha of .96. The current samples had reported Cronbach's alphas of $\alpha = .95-.96$. For the purposes of this study, the full scale was used and only the total score was examined.

The Composite Measure of Problem Behaviors. To measure drug and alcohol use the current study used the Drug Use and Excessive Alcohol Use subscales of the Composite Measure of Problem Behaviors (CMPB; Kingston, Clarke, Ritchie & Remington, 2011). The CMPB is a 46-item measure that assesses an individual's engagement in problem behaviors. These include nicotine use, deliberate self-harm, excessive Internet/computer game use, drug use, excessive exercise, excessive alcohol use, binge eating, sexual promiscuity, aggression, and restrictive eating (Kingston et al., 2011). Items are scored on a 6-point scale ranging from 1 (very like me) to 6 (very unlike me). The current study included the Drug Use, 6-items, and Excessive Alcohol Use, 5-items, subscales for a total of an 11-item scale. Each subscale has one reverse scored item. This study examined both the total score from the two subscales and the individual scores of each subscale. See Appendix N for the scale.

The CMPB demonstrates good psychometric properties with an internal reliability of the composite of $\alpha = .87$ (Kingston et al., 2011). Test-retest reliability was reported to be $r = .97$ at

2-weeks, $r = .87$ at 2–4 months, and $r = .91$ at 8–14 months. The subscales for this study, Drug Use and Excessive Alcohol Use subscales, also demonstrate good psychometric properties. The Drug Use subscale has an internal reliability of $\alpha = .91$ and test-retest reliability of $r = .91$ at 2-weeks. It is highly correlated with the Drug Problem Index ($r = .70, p < .01$). The Excessive Alcohol use subscale has an internal reliability of $\alpha = .86$ and test-retest reliability of $r = .89$ at 2-weeks. The Excessive Alcohol use subscale is highly correlated with the Alcohol Use Disorder Identification Test (Kingston et al., 2011), which is evidence of convergent validity. Cronbach's alpha for the current study was found to be $\alpha = .74$ –.83 for the total score, $\alpha = .55$ –.86 for the drug subscale, and $\alpha = .77$ –.95 for the alcohol subscale.

Depression Anxiety Stress Scales-21. The Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1993) was used to assess for participant's levels of depression and anxiety. See Appendix O. The DASS is a 21-item scale that assesses the individual's negative emotional systems over the past week. Items are rated on a 4-point scale of frequency or severity, dependent on item, with 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). A higher score is indicative of greater difficulties. The scale yields three subscale scores of Depression, Anxiety, and Stress with each scale containing 7 items. Total scores are multiplied by 2 and put into the DASS rating scale, which identifies levels of depression, anxiety, and stress.

The authors reported good internal consistency for each subscale of the full form DASS; Depression $\alpha = .91$, Anxiety $\alpha = .84$, and Stress $\alpha = .90$ (Lovibond & Lovibond, 1993). In a study of the DASS, Beck Anxiety Inventory (BAI), and Beck Depression Inventory (BDI) convergent validity was demonstrated. The DASS anxiety scale was significantly correlated with the BAI, $r = .81$, while the DASS depression scale was significantly correlated with the BDI, $r = .74$. The

DASS-21 has been normed on a sample of 1794 adult non-clinical individuals from the UK and resulted in adequate Cronbach's alpha; Depression $\alpha = .82$, Anxiety $\alpha = .90$, and Stress $\alpha = .93$ (Henry & Crawford, 2005). The current study found Cronbach's alpha for the total scale to be $\alpha = .94-.95$, Depression $\alpha = .88-.91$, Anxiety $\alpha = .85-.86$, and Stress $\alpha = .87-.91$.

Compulsive Internet Use Scale. The Compulsive Internet Use Scale (CIUS) is a 14-item scale developed to assess for severity of compulsive Internet use and was based on addiction criteria as well as previous behavior addiction literature (Meerkerk et al., 2006). See Appendix P. Items are rated on a 5-point Likert type scale ranging from 0 (never) to 4 (very often). A higher score is indicative of a great likelihood of Internet addiction.

The authors reported good psychometric properties for CIUS (Meerkerk, 2009). The measure was normed on three different samples collected via an online sampling method. Within the three samples the authors reported strong internal consistency of $\alpha = .89-.90$. The authors stated that all items loaded onto a single factor (Meerkerk, 2009). Further, the measure had a reported one-year temporal stability of $r = .82$ (Meerkerk, 2009). The current sample had a reported Cronbach's alpha of $\alpha = .93-.94$. The total score of the CIUS was used in this study to assess for the criterion validity of the PCBS and to determine the predictive value of compulsive internet use to problematic cybersexual behavior.

Results

Data Preparation

Several steps were taken to prepare the data of all three phases for analysis. The amount of missing data were assessed and determined to be less than 10% of the entire data set for all phases; thus, it was accounted for in each by using a listwise deletion method. Second, the outliers were assessed and those who scored two standard deviations above or below the mean were recorded as outliers. Outliers were addressed in a similar manner and comprised less than

10% of each of the data sets; thus, they were also accounted for using a listwise deletion method. This was chosen in order to limit the analyses only to participants who had completed all measures. While a listwise deletion can lead to bias and no analyses were conducted between completers and non-completers, based on the large sample size, it is unlikely that a bias would have appeared (Peugh & Enders, 2004). Subsequently, an analysis of outliers, or individuals who scored significantly outside of the mean, was conducted, and it was determined that individuals with scores that outlied the majority did not produce a significant effect on the sample means.

The means for each scale and subscale were calculated for the sample, prior to the factor analysis, and kurtosis and skew were assessed. See Table 7 below for descriptive data for Phase One, Table 8 for Phase Two, and Table 9 for Phase Three. Subsequently, the data from Phase Two and Phase Three were combined to form the combined sample of students and general population for the CFA and subsequent analyses. This sample will hereby be referred to as Phase Four. See Table 10 for the descriptive data for Phase Four. The means for the PCBS for the four data sets were compared as significant differences would impact the planned confirmatory factor analysis. It was found that there was not a significant difference between the Phase One and Phase Two samples, $t = .79, p > .05$. However, significant differences were found between the Phase One and Phase three samples, $t = - 8.26, p < .001$, the Phase Two and Phase Three samples, $t = -9.26, p < .001$, and the Phase One and Phase Four samples, $t = -.487, p < .001$. Based on this, it was determined that the Phase Three sample was reporting higher rates of cybersexual addiction as measured by the PCBS. The implications of these differences for this study and future research will be discussed further below.

The data for the CPUI-9, the IAT_{sex}, and the SCS were determined to be significantly non-normally distributed in both the Phase One and Phase Two samples. This may be reflective of

the behavior being assessed and the range of participation or pathology associated with it. This is not reflected in the PCBS or ISST as both reflect a normal distribution, nor is this reflected for the above measures in the Phase Three, MTurk sample. While a non-normal distribution can adversely affect regression analyses, as the Phase Four data did not demonstrate a significantly non-normal distribution this is unlikely to have impacted the planned regression analyses for Hypothesis Three.

Table 7

Means, Standard Deviations, Ranges, Skew, and Kurtosis for Phase One Variables

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Problematic Cybersexual Behavior Scale	74.56 (26.53)	42-125	.91	.30
Factor One	18.77 (7.25)	14-48	1.98	3.71
Factor Two	32.97 (14.36)	15-73	.61	-.62
Factor Three	15.47 (7.03)	8-39	.96	.26
Factor Four	6.02 (3.56)	4-20	1.82	2.46
Internet Sex Screening Test	31.44 (4.02)	25-46	.81	.72
Online Sexual Compulsivity	6.75 (1.15)	6-11	1.79	2.95

Online Sexual Behavior-Social	6.16 (1.35)	5-10	.92	-.18
Online Sexual Behavior-Isolated	6.58 (1.22)	4-8	-.56	-.61
Online Sexual Spending	3.37 (.70)	3-6	1.91	3.01
Interest in Online Sexual Behavior	2.26 (.52)	2-4	1.86	2.60
Cyber Pornography Use Inventory- 9	16.18 (9.14)	9-59	1.81	3.53
Effort	5.67 (4.24)	3-21	2.01	3.60
Compulsivity	4.49 (2.84)	3-21	2.66	8.30
Guilt	5.81 (4.07)	3-21	1.67	2.31
Internet Addiction Test _{sex}	32.83 (15.48)	20-120	2.16	6.25
Sexual Compulsivity Scale	14.94 (5.64)	10-40	1.70	2.92
Shame Inventory	134.43 (39.01)	49-266	-.06	-.22
UCLA Loneliness Scale	56.20 (15.93)	20-80	-.36	-.82

Table 7 continued

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Composite Measure of Problem Behaviors	47.45 (10.80)	17-65	-.71	-.32
Drug Use	26.61 (5.92)	10-36	-1.07	.27
Alcohol Use	20.83 (6.99)	5-30	-.50	-.77
Depression Anxiety Stress Scales-21	39.38 (14.83)	21-84	.76	-.17
Depression	12.96 (5.57)	7-28	.93	.09
Anxiety	12.28 (5.07)	7-28	.88	-.09
Stress	14.15 (5.47)	7-28	.55	-.61
Compulsive Internet Use Scale	31.6 (12.62)	14-69	.46	-.47

Table 8

Means, Standard Deviations, Ranges, Skew, and Kurtosis for Phase Two Variables

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Problematic Cybersexual Behavior Scale	73.01 (25.86)	41-141	.70	-.50
Factor One	19.47 (8.01)	14-50	1.76	2.27
Factor Two	32.49 (14.08)	15-68	.46	-.94
Factor Three	15.00 (6.65)	8-36	1.00	.39
Factor Four	6.04 (3.23)	4-19	1.68	2.11
Internet Sex Screening Test	31.38 (4.01)	25-44	.46	-.16
Online Sexual Compulsivity	6.77 (1.19)	6-12	1.71	2.64
Online Sexual Behavior-Social	6.20 (1.29)	5-10	.82	-.27

Online Sexual Behavior-Isolated	6.51 (1.32)	4-8	-.54	.83
Online Sexual Spending	3.35 (.66)	3-6	1.92	3.23
Interest in Online Sexual Behavior	2.27 (.52)	2-4	1.74	2.18
Cyber Pornography Use Inventory- 9	16.29 (9.13)	9-47	1.48	1.48
Effort	5.76 (3.81)	3-21	1.44	1.25
Compulsivity	4.62 (2.93)	3-17	2.20	4.52
Guilt	5.91 (4.56)	3-21	1.74	2.29
Internet Addiction Test- Sex	32.39 (14.55)	20-87	1.49	1.65
Sexual Compulsivity Scale	15.39 (5.39)	10-34	1.35	1.25
Shame Inventory	140.55 (38.96)	50-245	-.09	-.27
UCLA Loneliness Scale	45.22 (15.81)	20-80	.27	-.74

Table 8 continued

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Composite Measure of Problem Behaviors	46.39 (12.54)	11-66	-.29	-.60
Drug Use	26.47 (8.64)	6-36	-.52	-.87
Alcohol Use	19.93 (6.61)	5-30	-.23	-.87
Depression Anxiety Stress Scales-21	41.55 (15.01)	21-84	.55	-.43
Depression	13.42 (5.81)	7-28	.81	-.19
Anxiety	13.17 (5.21)	7-28	.73	-.23
Stress	14.95 (5.52)	7-28	.30	-.82
Compulsive Internet Use Scale	33.98 (12.87)	14-70	.25	-.71

Table 9

Means, Standard Deviations, Ranges, Skew, and Kurtosis for All Phase Three Variables

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Problematic Cybersexual Behavior Scale	95.22 (39.77)	44-205	.55	-.50
Factor One	26.98 (13.96)	14-70	.98	-.17
Factor Two	39.58 (14.47)	14-70	-.09	-.94
Factor Three	15.56 (7.52)	7-35	.52	-.78
Factor Four	8.04 (4.68)	4-20	.85	-.55
Internet Sex Screening Test	35.50 (5.60)	25-50	.57	-.08
Online Sexual Compulsivity	7.55 (1.89)	6-12	.98	-.29
Online Sexual Behavior Social	7.00 (1.65)	5-10	.33	1.06.
Online Sexual Behavior Isolated	7.03 (1.09)	4-8	-1.00	.21
Online Sexual Spending	4.14 (.98)	3-6	.41	-.87
Interest in Online Sexual Behavior	2.80 (.78)	2-4	.36	-1.29
Cyber-Pornography Use Inventory-9				
Effort	8.46 (5.39)	3-21	.46	-.64
Compulsivity	7.33 (4.77)	3-21	.55	.01
Guilt	7.77 (5.16)	3-21	.32	-.13
UCLA Loneliness Scale	43.51 (15.93)	20-80	.19	-.85
Composite Measure of Problem Behaviors	47.29 (13.64)	11-66	-.45	-.58
Drug Use	26.71 (8.66)	6-36	-.65	-.85
Alcohol Use	20.57 (6.91)	5-30	-.42	-.79

Table 9 continued

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Depression Anxiety Stress Scales-21	41.78 (13.93)	21-84	.38	-.80
Depression	14.35 (6.19)	7-28	.46	-.80
Anxiety	12.91 (5.40)	7-28	.55	-.78
Stress	14.53 (5.85)	7-28	.32	-.93
Compulsive Internet Use Scale	36.78 (13.93)	14-70	.17	-.80

Table 10

Means, Standard Deviations, Ranges, Skew, and Kurtosis for Phase Four Variables

Scale	Mean (SD)	Sample Range	Skew	Kurtosis
Problematic Cybersexual Behavior Scale	83.78 (33.68)	41-205	.83	.10
Factor One	23.11 (11.89)	14-70	1.48	1.37
Factor Two	37.14 (15.60)	15-75	.23	-1.03
Factor Three	16.50 (7.74)	8-40	.76	-.31
Factor Four	7.01 (4.12)	4-20	1.26	.50
Internet Sex Screening Test	33.38 (5.27)	25-50	.76	.48
Online Sexual Compulsivity	7.15 (1.62)	6-12	1.41	1.06
Online Sexual Behavior Social	6.59 (1.52)	5-10	.63	-.66
Online Sexual Behavior Isolated	6.76 (1.24)	4-8	-.77	-.41
Online Sexual Spending	3.73 (.92)	3-6	1.00	-.05
Interest in Online Sexual Behavior	2.53 (.71)	2-4	.96	-.42
CyberPornography Use Inventory-9	19.82 (11.92)	9-63	1.17	.66
Effort	7.07 (4.84)	3-21	1.10	.21
Compulsivity	5.93 (4.16)	3-21	1.52	1.54
Guilt	6.81 (4.94)	3-21	1.28	.67
Internet Addiction Testsex	39.55 (20.74)	20-120	1.24	.85
Sexual Compulsivity Scale	16.79 (7.03)	10-40	1.17	.58
Shame Inventory	140.21 (42.73)	50-300	.15	-.10
UCLA Loneliness Scale	44.39 (15.88)	20-80	.23	-.78

Table 10 continued

Scale	Mean (<i>SD</i>)	Sample Range	Skew	Kurtosis
Composite Measure of Problem	46.82 (13.09)	11-66	-.37	-.59
Behaviors				
Drug Use	26.59 (8.64)	6-36	-.51	-.86
Alcohol Use	20.24 (6.76)	5-30	-.32	-.84
Depression Anxiety Stress Scales-21	41.67 (15.63)	21-84	.46	-.66
Depression	13.87 (6.01)	7-28	.64	-.55
Anxiety	13.04 (5.30)	7-28	.63	-.51
Stress	14.75 (5.68)	7-28	.30	-.88
Compulsive Internet Use Scale	35.34 (13.46)	14-70	.23	-.74

Per the proposed data preparation, intercorrelations between the PCBS items were conducted to determine initial validation of the measure items. With the exception of two items, the proposed items of the PCBS evidenced significant positive correlations with the other items. The two items that did not reflect any correlation with the other items were item 19, “I only look at online sexual material when I am in a good mood,” and 49, “I have little to no difficulty controlling my online sexual material or behavior.” Both were reverse scored items. See Table 11 for PCBS item correlations.

Table 11

Problematic Cybersexual Behavior Scale Item Correlations

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	.32**															
3	.44**	.33**														
4	.32**	.34**	.36**													
5	.28**	.50**	.29**	.37**												
6	.14**	.08	.07	.19**	.23**											
7	.32**	.16**	.28**	.20**	.15**	.07										
8	.36**	.30**	.27**	.32**	.36**	.43**	.19**									
9	.29**	.22**	.23**	.28**	.23**	.49**	.24**	.49**								
10	.36**	.25**	.38**	.31**	.24**	.04	.35**	.23**	.19**							
11	.31**	.43**	.30**	.33**	.72**	.19**	.06	.40**	.18**	.20**						
12	.36*	.37**	.42**	.36**	.45**	.17**	.09	.45**	.29**	.29**	.53**					
13	.37**	.26**	.25**	.32**	.36**	.05	.31**	.25**	.25**	.25**	.30**	.31**				
14	.40**	.41**	.41**	.39**	.43**	.17**	.30**	.38**	.28**	.29**	.43**	.49**	.37**			

Table 11

Continued

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	.30**	.43**	.33**	.30**	.47**	.14**	.15**	.34**	.21**	.31**	.35**	.44**	.25**	.37**		
16	.25**	.18**	.17**	.24**	.21**	.63**	.19**	.51**	.53**	.09	.21**	.23**	.17**	.26**	.18**	
17	.28**	.19**	.22**	.26**	.32**	.48**	.11*	.53**	.44**	.13*	.33**	.32*	.31**	.26**	.25**	.50**
18	.30**	.24**	.18**	.27**	.39**	.36**	.13*	.43**	.32**	.12*	.38**	.35**	.28**	.41**	.36**	.35**
19	.00	.00	-.10	0	.03	0	.02	-.06	.03	-.04	-.08	-.02	-.04	-.03	-.03	.02
20	.33**	.27**	.36**	.50**	.29**	.23**	.26**	.42**	.29**	.27**	.28**	.31**	.38**	.54**	.31**	.33**
21	.25**	.17**	.21**	.21**	.17**	.27**	.19**	.29**	.42**	.29**	.16**	.20**	.20*	.18**	.21**	.35**
22	.44**	.15**	.41**	.27**	.23**	.09	.43**	.27**	.19**	.18**	.23**	.27**	.31**	.30**	.18**	.17**
23	.28**	.24**	.27**	.19**	.32**	-.03	.32**	.23**	.04	.38**	.31**	.31**	.26**	.36**	.34**	.04
24	.27**	.41**	.31**	.34**	.61**	.27**	.12*	.37**	.31**	.26**	.61**	.44**	.30**	.37**	.41**	.27**
25	.53**	.25**	.41**	.33**	.25**	.22**	.36**	.30**	.33**	.28**	.21**	.29**	.38**	.51**	.31**	.31**
26	.18**	.19**	.14**	.11**	.24**	-.03	.18**	.01	-.01	.31**	.20**	.23**	.29**	.23**	.29**	-.07
27	.20**	.13*	.20**	.23**	.14**	.50**	.12*	.25**	.45**	.14**	.14**	.16**	.17**	.25**	.16**	.51**
28	.17**	.41**	.25**	.33**	.63**	.17**	.04	.33**	.23**	.17**	.61*	.42**	.33**	.31**	.41**	.20**

Table 11

Continued

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
29	.49**	.29**	.42**	.36**	.28**	.26**	.27**	.49**	.40**	.34**	.31**	.43**	.45**	.49**	.32**	.42**
31	.24**	.25**	.30**	.21**	.23**	.02	.26**	.17**	.05	.30**	.26**	.29**	.26**	.36**	.28**	.09
31	.27**	.25**	.22**	.32**	.29**	.42**	.08	.39**	.37**	.15**	.32**	.31**	.22**	.32**	.30**	.44**
32	.24**	.37**	.26**	.24**	.48**	.23**	.08	.43**	.29**	.21**	.47**	.56**	.24**	.31**	.39**	.23**
33	.27**	.18**	.30**	.26**	.17**	.33**	.11*	.36**	.40**	.20**	.16**	.23**	.19**	.27**	.19**	.41**
34	.15**	.22**	.24**	.14*	.21**	-.03	.19*	.05	.02	.36**	.22**	.26**	.18**	.26**	.32**	-.03
35	.28**	.32**	.23**	.35**	.45**	.25**	.03	.37**	.31**	.21**	.40**	.50**	.25**	.29**	.39**	.23**
36	.20**	.26**	.17**	.17**	.44**	.13*	-.01	.29**	.10	.15**	.45**	.40**	.15**	.26**	.33**	.12**
37	.35**	.27**	.35**	.33**	.30**	.11*	.23**	.29**	.25**	.35**	.25**	.39**	.39**	.39**	.36**	.17**
38	.31**	.16**	.25**	.26**	.13*	.19**	.24**	.27**	.24**	.27**	.18**	.22**	.36**	.27**	.16**	.30**
39	.15**	.28**	.16**	.16**	.42**	.22**	.00	.32**	.21**	.10*	.41**	.38**	.16**	.15**	.31**	.19**
40	.30**	.41**	.38**	.38**	.58**	.26**	.15**	.39**	.25**	.34**	.60**	.49**	.38**	.43**	.44**	.31**
41	.30**	.31**	.38**	.36**	.33**	.04	.14**	.25**	.13*	.49**	.30**	.41**	.24**	.42**	.46**	.09
42	.53**	.33**	.39**	.47**	.35**	.29**	.25**	.42**	.36**	.32**	.36**	.48**	.39**	.52**	.33**	.45**

Table 11

Continued

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
43	.31**	.23**	.31**	.25**	.36**	.33**	.14**	.45**	.40**	.24**	.39**	.44**	.30**	.34**	.33**	.45**
44	.12*	.24**	.39**	.24**	.28**	.03	.16**	.15**	.05	.14**	.32**	.35**	.36**	.36**	.27**	.09
45	.16**	.23**	.27**	.09	.14**	.03	.39**	.12*	.07	.17**	.17**	.19**	.30**	.25**	.29**	.18**
46	.24**	.46**	.34**	.37**	.56**	.19**	.09	.35**	.28**	.26**	.53**	.48**	.27**	.49**	.43**	.25**
47	.12*	.21**	.23**	.14*	.25**	.04	.18**	.13*	.05	.37**	.25**	.29**	.22**	.31**	.43**	.05
48	.20**	.37**	.30**	.24**	.58**	.16**	.10	.34**	.26**	.26**	.57**	.44**	.34**	.35**	.42**	.23**
49	.13*	.02	.06	-.01	-.08	-.02	.06	.05	.02	-.02	-.02	-.05	.01	.01	.00	.05
50	.35**	.17	.32**	.17**	.17**	.08	.36*	.25**	.16**	.50**	.20**	.20**	.26**	.22**	.29**	.20**
51	.16**	.32**	.21**	.21**	.25**	.00	.22**	.29**	.08	.36**	.26**	.37**	.20**	.23**	.40**	.03
52	.27**	.43**	.39**	.35**	.52**	.14**	.14**	.30**	.24**	.26**	.50**	.38**	.34**	.42**	.37**	.22*

Table 11

Continued

Item	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
17																
18	.39**															
19	.02	.07														
20	.29**	.34**	-.02													
21	.35**	.17**	.02	.22**												
22	.20**	.20**	0	.35**	.23**											
23	.11*	.21**	-.01	.32**	.22**	.34**										
24	.34**	.43**	-.07	.36**	.25**	.22**	.35**									
25	.22**	.29**	-.02	.55**	.37**	.46**	.38**	.33**								
26	-.01	.14**	.02	.16**	.14**	.23**	.32**	.27**	.28**							
27	.34**	.27**	.05	.24**	.34**	.21**	.16**	.26**	.36**	.12**						
28	.30**	.38**	-.03	.25**	.20**	.13**	.24**	.59**	.20**	.19**	.19**					
29	.39**	.37**	-.01	.57**	.41**	.38**	.33**	.35**	.55**	.17**	.42**	.30**				
31	.05	.15**	.01	.29**	.15**	.29**	.27**	.29*	.32*	.42**	.15**	.26**	.25**			

Table 11

Continued

Item	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
32	.31**	.35**	.06	.26**	.17**	.24**	.26**	.46**	.19**	.18**	.18**	.38**	.29**	.26**	.33	
33	.36**	.26*	0	.39**	.46**	.30**	.19**	.23**	.47**	.08	.42**	.12*	.50**	.19**	.42**	.23**
34	-.04	.13*	.06	.19**	.10*	.22**	.29**	.29**	.25**	.68**	.16**	.20**	.19**	.44**	.07	.15**
35	.35**	.35**	.05	.29**	.28**	.17**	.15**	.45**	.20**	.21**	.17**	.40**	.34**	.27**	.34**	.53**
36	.20**	.25**	.07	.22**	.15**	.11*	.18**	.38**	.15**	.20**	.08	.40**	.23**	.26**	.27**	.43**
37	.20**	.23**	-.01	.45**	.30**	.34**	.30**	.34**	.47**	.31**	.26**	.30**	.50**	.28**	.28**	.25**
38	.25**	.16**	-.01	.31**	.40**	.30**	.17**	.15**	.41**	.15**	.31**	.15**	.47**	.18**	.32**	.14**
39	.25**	.34**	-.18	.14*	.14**	.09	.16**	.35**	.08	.17**	.10*	.42**	.26**	.15**	.35**	.47**
40	.33**	.42**	-.07	.35**	.27**	.25**	.34**	.71**	.30**	.25**	.32**	.62**	.45**	.33**	.31**	.44**
41	.07	.17**	-.04	.36**	.18**	.26**	.35**	.35**	.31**	.34**	.18**	.31**	.35**	.43**	.19**	.30**
42	.40**	.40**	-.02	.56**	.32**	.37**	.35**	.42**	.60**	.27**	.35**	.31**	.60**	.30**	.36**	.34**
43	.45*	.37**	-.06	.35**	.32**	.25**	.24**	.42**	.38**	.13*	.35**	.33**	.48**	.19**	.43**	.38**
44	.17**	.21**	-.02	.29**	.12*	.33**	.29**	.31**	.29**	.24**	.18**	.31**	.31**	.20**	.25**	.27**
45	.07	.08	.00	.27**	.14**	.39**	.27**	.20**	.44**	.25**	.19**	.17**	.29**	.25**	.11**	.15**

Table 11

Continued

Item	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
46	.21**	.39**	-.04	.34**	.22**	.22**	.30**	.62**	.33**	.24**	.30**	.57**	.38**	.29**	.33**	.42**
47	.08	.22**	.07	.20**	.17**	.19**	.37**	.33**	.31**	.51**	.25**	.27**	.29**	.36**	.17**	.18**
48	.25**	.37**	-.03	.28**	.16**	.24**	.29**	.64**	.30**	.33**	.26**	.58**	.33**	.32**	.29**	.39**
49	-.08	.07	-.11	.04	-.05	.01	-.03	-.06	.10	-.03	.02	-.07	.10	-.01	.01	-.04
50	.15*	.17**	-.02	.25**	.29**	.38**	.31**	.27**	.44**	.32**	.26**	.17**	.43**	.30**	.21**	.18**
51	.09	.20**	-.03	.17**	.15**	.14**	.57**	.30**	.19**	.20**	0.1	.32**	.21**	.19**	.18**	.28**
52	.20**	.33**	-.03	.34**	.23**	.25**	.38**	.60**	.30**	.20**	.26**	.52**	.41**	.30**	.25**	.38**

Table 11

Continued

Item	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
33	-															
34	.09															
35	.25**	.20**														
36	0.08	.23**	.42**													
37	.39**	.32**	.30**	.30**												
38	.41**	.18**	.26**	.11*	.38**											
39	.14**	.13**	.42**	.38**	.24**	.08										
40	.25**	.33**	.44**	.42**	.44**	.24**	.38**									
41	.17**	.44**	.39**	.33**	.44**	.25**	.22**	.45**								
42	.41**	.27**	.37**	.29**	.49**	.36**	.21**	.50**	.41**							
43	.34**	.17**	.39**	.31**	.39**	.30**	.26**	.45**	.27**	.51**						
44	.18**	.30**	.23**	.23**	.30**	.17**	.20**	.35**	.27**	.31**	.28**					
45	.22**	.35**	.09	.09	.30**	.35**	.02	.24**	.23**	.31**	.26**	.42**				
46	.25**	.34**	.42**	.42**	.36**	.25**	.31**	.71**	.45**	.44**	.40**	.36**	.30**			

Table 11

Continued

Item	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
47	.19**	.66**	.22**	.19**	.33**	.24**	.18**	.35**	.44*	.31**	.23**	.27**	.36**	.37**		
48	.23**	.37**	.31**	.38**	.39**	.16**	.36**	.63**	.39**	.43**	.41**	.31**	.31**	.63**	.43**	
49	.02	.00	-.12	-.05	.03	.03	-.10	-.01	-.02	.09	.00	.07	.02	-.07	-.03	-.10
50	.35**	.39**	.20**	.14*	.41**	.38**	.13*	.29**	.33**	.37**	.30**	.22**	.49**	.31**	.45**	.30**
51	.15**	.28**	.23**	.29**	.29**	.19**	.22**	.37**	.41**	.24**	.28**	.28**	.37**	.34**	.34**	.31**
52	.22**	.24**	.37**	.36**	.37**	.18**	.30**	.69**	.37**	.46**	.38**	.35**	.24**	.75**	.27**	.62**

Table 11

Continued

Item	49	50	51	52
49				
50	0.05			
51	.28**	.28**		
52	-0.04	.27**	0.28**	-

* p < .05, ** p < .01, *** p < .001

Hypothesis One

It was hypothesized that the new measure of cybersexual addiction, Problematic Cybersexual Behavior Scale (PCBS), would have better internal consistency and a more robust factor analytic structure than traditional measures of cybersexual addiction. Specifically, the PCBS was compared to the Internet Sex Screening Test (ISST), the Cyber-Pornography Use Inventory-9 (CPUI-9), and the Internet Addiction Test- Sex (*IAT_{sex}*). The Sexual Compulsivity Scale (SCS) was excluded from this hypothesis as it was created to measure offline sexual addiction behaviors. The SCS was used to further validate the criterion validity of the PCBS and to examine the relationship between offline and online sexual addiction.

Problematic Cybersexual Behavior Scale exploratory factor analysis. The data from Phase One were used to conduct an exploratory factor analysis (EFA) to determine the factor structure of the Problematic Cybersexual Behavior Scale (PCBS). Subsequently, the factor analysis was conducted an additional time to confirm the factor structure of the PCBS prior to collecting Phase Two and Phase Three data. Factor analyses were conducted using MPlus© 7.4 (Muthén & Muthén, 2008) and included a parallel analysis which compares both the eigenvalues both of the sample and those of a random sample to determine the significance of the factors (Horn, 1965). This method is utilized in order to reduce the likelihood of under or over-extraction of the model. The use of the z -statistic to determine the significance of factor loadings was utilized as this method is considered superior to the more general “rule of thumb” utilization of cut-offs (Cudeck & O’Dell, 1996).

It was hypothesized that the EFA would produce a five-factor model based on the development of the measure from the proposed hypersexual disorder diagnostic criteria (Kafka, 2010). Factor inclusion was determined using the following techniques consistent with previous

literature: a scree test (Cattell, 1966), the Kaiser-Guttman rule (Kaiser, 1960), and a parallel analysis (Horn, 1965). The use of a scree test involved examination of the scree plot (Cattell, 1966), whereas the Kaiser-Guttman rule states that factors with eigenvalues greater than one are included in the final model, and the parallel analysis involved comparison of factor eigenvalues with those from a random data matrix (Horn, 1965). Prior to analysis, it was determined that if these techniques yielded a number of statistically valid options, theoretically grounded reasoning would be used to determine the best fit model. Once the best fit model was determined and a valid number of factors chosen, the item standard errors of loading were examined for significance of factor loadings using a z-statistic. For the PCBS, the two-tailed Bonferroni critical value was calculated at $\alpha = .05$ per Cudeck and O'Dell (1994), yielding a z-statistic of $z = 3.18$ for the four-factor solution. Items that reflected a standard error of loading above this number were included in the scale.

The Kaiser-Guttman rule was used to identify factors with an eigenvalue greater than one. Once identified, these factors were retained. Thus, the model retained a 10-factor solution using this method (see Table 12 for eigenvalues). As this likely represents an over-extraction of factors, the scree plot and parallel analysis were then used to determine the factor structure.

Table 12

Eigenvalues for Problematic Cybersexual Behavior Scale

Factor	1	2	3	4	5	6	7	8	9	10
Eigenvalue	15.81	3.74	3.45	1.80	1.48	1.314	1.29	1.16	1.15	1.07

The second method used to determine retained factors, was to examine the scree plot per Cattell's (1966) method. Using this method, points of leveling off, or "elbows," are examined to

determine the number of factors for the model (Cattell, 1966). Per the scree plot, clear leveling is found for both two and five factors. Based on this, the data suggest a one-, three-, or a four-factor model. Notably, this method is considered the most subjective of the three methods, thus the results of the parallel analysis were weighted more heavily. See Figure 1 for scree plot.

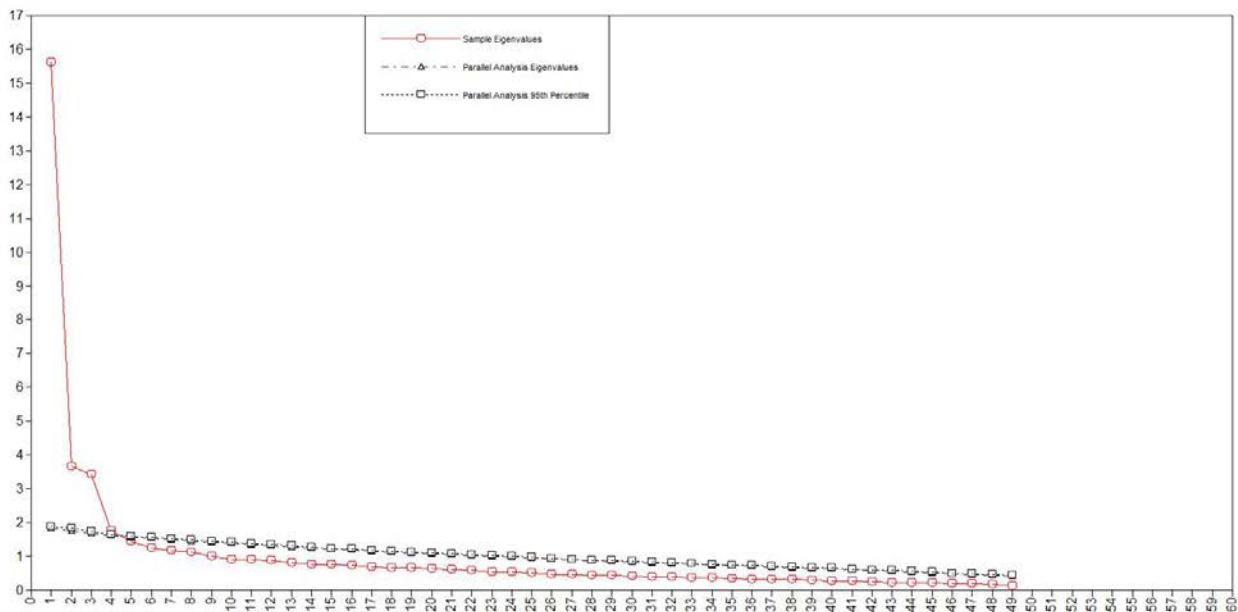


Figure 1. PCBS exploratory factor analysis scree plot.

The third method of determining factor number was a parallel analysis conducted using MPlus 7.4 (Muthen & Muthen, 2008). The eigenvalues from this analysis were compared in a plot with the EFA results to determine the point where the EFA results fell below that of chance responding. Results of a parallel analysis suggested a four-factor model was the best fit for the current data. To clarify, the Kaiser-Guttman rule suggested a 10-factor model, Cattell's scree plot method suggested a one or four factor model, and the parallel analysis suggested a one-, three-, or four-factor model. Further, the chi-square model comparison was reviewed and suggested that the four-factor solution may better represent the data than a three-factor model, $\Delta \chi^2 (45) =$

164.48, $p < .001$. Based on these methodologies, it was determined that a four-factor model was appropriate for further examination.

Initial exploration of the four-factor solution produced an adequate, but not strong, model of fit, $X^2(306) = 2442.31$, $p < .001$, SRMR = .04, RMSEA = .06, CFI = .84, and TLI = .82. Upon evaluating factor loadings, three items were eliminated due to not loading on any of the four factors. Items that were eliminated in this initial stage included Items 19{r}, 49{r}, and 51. The removal of the two reverse scored items may reflect poor wording of the items or a lack of care and attention by participants in answering these two items. Analysis after the removal of these three items continued to support a four-factor model, $X^2(899) = 1919.88$, $p < .001$, SRMR = .03, RMSEA = .05, CFI = .87, and TLI = .84. As the model demonstrated continued inadequate fit, items that demonstrated significant cross-loadings, including one non-loading item (Item 42), were examined for removal as determined by having factor loadings of $> .30$ on more than one factor (Norberg, Wetterneck, Sass, & Kanter, 2011; Raubenheimer, 2004). The removal of stated items was conducted in addition to the removal of the three items that were removed upon the initial EFA. The removal of these items produced a better model fit, $X^2(662) = 1394.79$, $p < .001$, SRMR = .03, RMSEA = .05, CFI = .89, and TLI = .86; thus, they were removed from the final PCBS measure. In sum, a total of nine items were removed from the PCBS, including five for nonsignificant loadings and four for significant cross-loading. See Table 13 for factor loadings.

Table 13

Problematic Cybersexual Behavior Scale Item Factor Loadings

Item	F1	F2	F3	F4
1. I sometimes fail to meet my commitments or responsibilities because of my online sexual behavior.	.66	.03	.03	-.11
3. I have declined invitations to be with friends or attend social functions in order to spend more time in pursuit of sexual material.	.56	.16	-.06	-.02
4. Online sexual behavior has affected my romantic relationships.	.40	.25	.05	-.10
7. I am spending more money on line sexual material or behavior than I can afford.	.55	.20	.02	.07
10. I have paid money to gain access to online sexual material.	.39	.03	-.02	.25
13. I have continued to use online sexual material even after a significant other asked me to stop.	.49	.18	-.04	-.02
14. If I do not have access to online sexual material, I feel anxious, upset, or angry.	.52	.24	.01	.00
20. Online sexual behavior has made it difficult for me to have a romantic relationship.	.59	.07	.13	-.05
22. I have missed a deadline at work or school because of my online sexual behavior.	.59	-.03	.00	.02
23. I find myself searching for online sexual material while at work or school.	.42	.18	.15	.15
25. Online sexual behavior has negatively affected my friendships.	.69	-.12	.17	.08

29. I have continued to use online sexual material even though I know it is getting in the way of my life.	.58	.04	.28	-.01
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Table 13 continued

37. I have continued to use online sexual material even after someone expressed concern.	.46	.12	.04	.15
38. I have made promises to others to stop using the Internet for online sexual material or behavior.	.42	-.13	.27	.09
42. ▲ Online sexual behavior has interfered with my life.				
45. ● Online sexual behavior has caused me problems at work (e.g. lost a job, called off sick in order to be online).	.36	.16	.03	.33
50. ● I have spent more money than planned on online sexual material or behavior.	.36	-.07	.13	.40
49. {r} ▲ I have little to no difficulty controlling my online sexual behavior {r}.				
2. I have had to start looking for more intense or hardcore material in order to orgasm.*	.23	.49	-.08	-.02
5. When I am stressed, I often engage in online sexual behavior.	.02	.81	-.05	-.10
11. I find myself looking at online sexual material after I have had a difficult day.	.02	.82	-.06	-.05
12. I have procrastinated on my work or other responsibilities so that I could pursue online sexual material or behavior.	.23	.50	.02	.02
15. I am engaging in riskier online sexual behavior than I was when I first started.	.14	.39	.03	.19
18. I struggle to control my sexual thoughts and behaviors.	.05	.37	.30	.00
24. I have used online sexual materials as a way to cope with feeling bad.	-.01	.73	.08	.09

28. Viewing online sexual material or engaging in online sexual behavior helps me to cope with stress.	-.08	.80	.00	.00
32. I have stayed up past when I wanted to in order to access online sexual material.	.03	.56	.09	-.02
Table 13 continued				
35. I have gone out of my way to access online sexual material (e.g. using a specific e-mail address, clearing browser history, having a secondary computer).	.03	.48	.16	.03
36. I find myself seeking out online sexual material when I am bored.	-.04	.56	-.01	.06
39. I have waited until my roommate or significant other is not around to seek out sexual material online.	-.15	.53	.13	.02
40. I find myself seeking out online sexual material when I feel sad.	.05	.72	.07	.09
46. I find myself seeking out online sexual material when I feel anxious.	.04	.68	.03	.13
48. I find myself engaged in online sexual behavior after something stressful has happened in my life (ex. failing a test, fight with partner, bad review at work).	-.05	.67	.03	.23
51. ▲ I have searched for online sexual material from a public location (e.g. work, library, Internet café).				
52. I find myself seeking out online sexual material when I am worried.	.16	.67	-.06	.00
6. I feel ashamed after engaging in online sexual behavior.	-.25	.05	.84	.01
8. ● I find myself engaged in online sexual behavior even when I had tried to avoid it.	.18	.32	.40	-.16
9. I have punished myself after using the Internet for pornography or other sexual activity (ex. time out from	.09	.04	.61	-.06

computer, cancelling my Internet subscription, mentally berating myself).				
16. I am disgusted with myself and my online sexual behavior.	-01	.01	.80	-.06
17. I have tried to stop using the Internet for online sexual material or behavior.	.04	.22	.53	-.15

Table 13 continued

21. I have unsubscribed from sexually explicit websites to avoid using them.	.23	-.04	.39	.06
27. I feel sick after engaging in online sexual behavior.	.00	-.08	.67	.21
31. I worry about what my partner or roommate might say if they saw the amount of sexual material I pursue online.	.10	.18	.47	-.01
33. ● I have tried to block specific sexually explicit websites in order to prevent myself from using them.	.32	-.09	.49	.02
43. I spend more time on the Internet engaged with sexual material than I would like.	.16	.27	.37	.02
19. {r} ▲ I only look at online sexual material when I am in a good mood.				
41. ▲ I have signed up for an account on a sexually explicit website.				
26. I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable.	.08	.02	-.07	.70
30. I have posted sexual material of myself online.	.25	.12	-.05	.35
34. I have given out my real name online to someone for sexual purposes.	.00	.00	-.01	.87
47. I have increased the risks I take online to access sexual material (ex. using my real name, giving out my phone number).	.01	.07	.08	.71

Note 1. Items that did not load significantly per the examination of the standard errors were removed for clarity.

Note 2. Items were excluded from the final measure due to the following criteria: a) if the item did not load significantly per the standard error, or b) if the item loaded significantly on two factors (denoted by ● in this table).

Explanation for removal of Item 2. An error was made in the analysis of the initial Phase One EFA results that resulted in the removal of Item 2 from subsequent data collection.

The first Phase One EFA was conducted and interpreted using the hypothesized five-factor

model. This was based upon the Kaiser-Guttman rule of inclusion of eigenvalues over 1 which had suggested up to a 10-factor model fit (Kaiser, 1960) and theoretically based reasoning. Based on this, Items 2, 19R, 49R, and 51 did not significantly load on any of the factors. Thus, these items were removed from the measure and data collection for Phases Two and Three proceeded. This error was discovered at the end of data collection for Phases Two and Three, when upon further review of the data, it was determined that a four-factor model was more appropriate and Item Two was the sole item that continued to load under this model. However, as it was removed from the subsequent measure used for Phases Two and Three data collection, there are no validation data for Item 2. Data analysis does not suggest that the removal of this item significantly damaged the model, nor does it suggest that inclusion of this item improves the model significantly.

Factor labeling. Items within each factor of the PCBS were examined and the theme of each group of items was used to label the factors. Factor One, containing 14 items, was named Logistical Consequences as the items reflected consequences of the behavior related to activities of daily living. This factor specifically reflected Criterion B of the proposed hypersexual disorder diagnostic criteria (Kafka, 2010). For example, this factor included items such as “I sometimes fail to meet my commitments or responsibilities because of my online sexual behavior” and “I have missed a deadline at work or school because of my online sexual behavior.” Internal consistency for this factor was observed to be $\alpha = .87$.

Factor Two appeared to have two distinct groupings of items and contained a total of 15 items. The first grouping of items that loaded onto this factor reflected the proposed factors of “seeking out in response to distress” and reflected Criteria A2 and A3 of the Kafka’s (2010) proposed criteria that assess for engaging in sexual behavior in response to dysphoric moods and

stressful events. These Factor Two PCBS items included “when I am stressed, I often engage in online sexual behavior,” and, “I find myself seeking out online sexual material when I feel sad.” The second grouping consisted of items that, when grouped together, reflected the concept of urgency (Billieux, Gay, Rochat, & Van der Linden, 2010). Urgency has been defined as “the facet of impulsivity that refers to individual differences in the proneness to act impulsively and rashly in emotional contexts” (Cyders & Smith, 2008; Whiteside & Lynam, 2001). Thus, Factor Two was named Urgency. Factor Two had a reported internal consistency of $\alpha = .92$.

Factor Three contained 8 items which reflected attempts to stop and emotional consequences following the use of online sexual material and reflected criterion A4 (Kafka, 2010); thus, this factor was named Emotional Consequences. Items included “I feel ashamed after engaging in online sexual behavior” and “I have unsubscribed from sexually explicit websites to avoid using them.” Items that reflected the attempts to stop included “I have unsubscribed from sexually explicit websites to avoid using them” and “I have tried to stop using the Internet for online sexual material or behavior.” Factor Three had a reported internal consistency of $\alpha = .85$. The separation of emotional consequences and the more logistical consequences of this behavior into two separate factors will be discussed further below.

Factor Four contained four items and was labeled Increased Risk Taking as each item reflected changes in the amount of risk the individual was willing to accept and was consisted with Criterion A5 of the hypersexual disorder criteria (Kafka, 2010). Items included “I have posted sexual material of myself online” and “I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable.” Internal consistency for Factor Four was reported to be $\alpha = .81$.

In sum, the PCBS produced a four-factor model using the exploratory factor analysis. The four-factor model was incongruent with Hypothesis One, which proposed that a five-factor model would emerge. It appeared that the proposed fifth factor was not extracted as the proposed items were fit into other factors. While the fit of the model was not a strong fit with regard to the standards of CFI and RMSEA, which are suggested to be CFI = .95 and RMSEA < .08 (Hu & Bentler, 1999), this model was pursued for further analysis in the CFA. A three-factor and five-factor model was pursued and items were winnowed from these models; however, upon examination both models resulted in poorer fit following item winnowing than the four-factor model. Thus, the four-factor model was further pursued. See Appendix Q for the final measure.

Confirmatory factor analysis. Using the Phase Four sample a CFA was conducted for the PCBS. This yielded a poor fit as measured by the CFI (.75) and RMSEA (.07), $X^2(772) = 4574.53, p < .001$. Due to the poor fit, additional CFAs were conducted using the separate Phase Two and Phase Three data sets to determine if one set of data was contributing to the worse fit. The university sample CFA yielded a poor fit as measured by the CFI (.80) and an adequate fit as measured by the RMSEA (.06). However, the MTurk sample CFA yielded a stronger, although still poor fit as measured by CFI = .85 and continued to reflect an adequate fit as measured by RMSEA = .06. Internal consistency ranged from .94–.96 respectively.

Due to the four-factor model of the PCBS not fitting adequately for the Phase Four sample, an additional exploratory analysis looking at measurement invariance was conducted to determine if measurement variance was contributing to decreased quality of fit. Using MPlus© 7.4 (Muthén & Muthén, 2008), a multigroup confirmatory factor analysis was conducted to compare fit between the Phase Two and Phase Three samples. When a model comparing overall structure between groups was fitted to the data, referred to as configural invariance, model fit

indicated poor fit as measured by CFI = .66 and RMSEA = .10. Additional models comparing metric and scalar invariance continued to display poor model fit between the two samples (see Table 14).

The significant variance between the model fit for the two measures likely contributed to the poor model fit with the Phase Four data. However, as noted above, the Phase Two sample of university students demonstrated a poor fit as well, whereas the Phase Three sample of individual recruited from MTurk yielded a similar model fit compared with the Phase One data. As measure comparison is the next step in the analyses, separate CFA were conducted for each measure on Phase Two and Phase Three data to allow for effective comparison of the measures.

Table 14

Problematic Cybersexual Behavior Scale Measurement Invariance Model Fit

Model	χ^2	<i>df</i>	Δ Chi-Square	CFI	RMSEA	SRMR
Configural Invariance	8763.66	1598	184.28***	.66	.10	.09
Metric Invariance	8763.66	1598	46.87***	.64	.10	.11
Scalar Invariance	8923.03	1638	85.81***	.64	.10	.11

* $p < .05$, ** $p < .01$, *** $p < .001$

Internet Sex Screening Test. A CFA for the ISST was conducted using the model reported by the initial authors in order to assess for this model's fit with the current data and to effectively compare it to the model fit for the PCBS (Delmonico & Miller, 2003). This model produced a poor fit as measured by CFI = .87 and an adequate fit as measured by the RMSEA = .05. Thus, an EFA was conducted to examine the most appropriate model fit for the ISST. The EFA for the ISST reflected a model inconsistent with the reported factor structure in the original validation sample (Delmonico, 1997).

Consistent with the initial analyses run by Delmonico and Miller (2003), Items 11 and 24 were not included in the EFA or CFA analyses; however, these items are included in the total score in order to be consistent with the previous literature and the use of this measure in both research and clinical settings. Phase One EFA produced a four-factor model as suggested by the Kaiser-Guttman rule, the scree plot, and the parallel analysis. This model produced good statistics measuring fit, $X^2(167) = 287.77, p < .001$, SRMR = .03, RMSEA = .04, CFI = .91 and TLI = .86. Items were examined using a Bonferroni critical value of $z = 2.69$. Based on this, 6 of the 23 items included in the EFA cross loaded onto factors. See Table 15 for the factor structure of the ISST.

Table 15

Factor Structure for Internet Sex Screening Test

Item	Factor One	Factor Two	Factor Three	Factor Four
1. I have some sexual sites bookmarked.	.37	-.34	.16	.06
2. I spend more than 5 hours per week using my computer for sexual pursuits.	.63	-.01	-.12	-.02
3. I have joined sexual sites to gain access to online sexual material.	.84	-.03	-.02	-.04
7. Internet sex has sometimes interfered with certain aspects of my life.	.34	.06	.15	.30
5. I have searched for sexual material through an Internet search tool.	-.02	.52	.11	.01
10. I have masturbated while on the Internet.	-.10	.85	.01	.01
13. I have tried to hide what is on my computer or monitor so others cannot see it.	-.01	.44	-.08	.34

15. I use the Internet to experiment with different aspects of sexuality (e.g., bondage, homosexuality, anal sex, etc.).	.00	.54	.21	.10
4. I have purchased sexual products online.	.08	.03	.38	.01

Table 15 continued

6. I have spent more money for online sexual material than I planned.	-.07	-.14	.34	.18
8. I have participated in sexually related chats.	.00	-.02	.64	-.06
9. I have a sexualized username or nickname that I use on the Internet.	.18	.10	.27	.00
12. No one knows I use my computer for sexual purposes.	-.01	-.06	.32	.16
16. I have my own website which contains some sexual material.	.06	.15	.30	-.01
17. I have made promises to myself to stop using the Internet for sexual purposes.	-.05	-.44	.32	.77
19. When I am unable to access sexual information online, I feel anxious, angry, or disappointed.	.04	-.05	.41	.27
21. I have punished myself when I use the Internet for sexual purposes (e.g., time-out from computer, cancel Internet subscription, etc.).	.23	-.03	.49	.00
23. I use sexual humor and innuendo with others while online.	-.04	.16	.58	-.03
25. I believe I am an Internet sex addict.	.02	.31	.51	-.18
14. I have stayed up after midnight to access sexual material online.	.10	.03	.13	.32
18. I sometimes use cybersex as a reward for accomplishing something. (e.g., finishing a project, stressful day, etc.).	-.04	-.03	-.08	.69
20. I have increased the risks I take online (give out name and phone number, meet people offline, etc.).	.18	.14	.14	.26

22. I have met face to face with someone I met online for romantic purposes.	.02	.03	.00	.66
------------------------------------------------------------------------------	-----	-----	-----	------------

The CFA for the ISST using the combined sample of Phases Two and Three also reflected a poor model fit. Specifically, the CFI as reported to be .82 and RMSEA = .05. While the literature suggests that a CFI over .90 is considered acceptable, a CFI over .95 is preferred (Hu & Bentler, 1999). Further, RMSEA is preferred to be under .08 to indicate reasonable model fit (Hu & Bentler, 1999). When the two samples were separated in order to effectively compare the separate samples used in the PCBS, the four-factor model showed little difference in fit. The Phase Two, university student, sample demonstrated similar adequate fit as measured by CFI = .82 and RMSEA = .04. The Phase Three, MTurk, sample reflected slightly better fit, CFI = .84 and RMSEA = .05.

Cyber-Pornography Use Inventory-9. The CPUI-9 had a reported three-factor structure with each factor comprised of three items (Grubbs, Volk, Exliner, & Pargament, 2015). The CFA conducted on the Phase Four CPUI-9 sample suggested the three-factor model was the best fit across the combined data. Specifically, for the combined sample the CFI was reported to be .98 and the RMSEA to be .05. Consistent with the PCBS and the ISST, separate CFAs were conducted on the Phase Two and Phase Three samples. The Phase Two (CFI = .96, RMSEA = .05) and the Phase Three sample (CFI = .98, RMSEA = .05) both reported a good model fit. Cronbach's alpha for this ranged from .86-.92. See Table 16 for the CPUI-9 factor loadings.

Table 16

Factor Structure of Cyber-Pornography Use Inventory-9

Item	Factor One	Factor Two	Factor Three
1. I believe I am addicted to Internet Pornography.	.83	-.06	.10
2. Even when I do not want to use pornography online, I feel drawn to it.	.85	.01	.05
3. I feel unable to stop my use of online pornography.	.94	.00	.00
4. At times, I try to arrange my schedule so that I will be able to be alone in order to view pornography.	.39	.39	-.16
5. I have refused to go out with friends or attend certain social functions to have the opportunity to view pornography.	.00	.86	.00
6. I have put off important priorities to view pornography.	.12	.68	.00
7. I feel ashamed after viewing pornography online.	.23	.01	.60
8. I feel depressed after viewing pornography.	.00	.40	.83
9. I feel sick after viewing pornography online.	.02	.21	.69

Internet Addiction Testsex. An EFA was conducted on the Phase One sample of the IATsex as the authors of the measure had used the measure in a single study and not reported a specific factor structure (Brand et al., 2011). The Kaiser-Guttman rule suggested a two-factor model was the best fit based upon eigenvalues over 1.00 (Kaiser, 1960). This was further supported by the scree plot analysis and the parallel analysis (Cattell, 1966; Horn, 1965). This model also produced a poor fit $X^2(151) = 648.53, p < .001, SRMR = .03, RMSEA = .10, CFI =$

.89, and TLI = .86. However, the single factor model reflected a worse fit $X^2(170) = 1027.16, p < .001$, SRMR = .03, RMSEA = .12, CFI = .81, and TLI = .79. Further, when comparing the two models, the change in chi-square also demonstrated the two-factor model was of stronger fit, $\Delta \chi^2(19) = 378.63, p < .001$. While this model did not produce a strong fit, it was chosen for further analysis in the CFA based on the above statistical support.

Factor One reflected consequences of the online sexual behavior, including emotional consequences and relationship consequences. Internal consistency was reported to be $\alpha = .94$. Factor Two reflected the amount of time spent or lost engaging in online sexual behavior. Cronbach's alpha for factor two was reported to be $\alpha = .91$. Of note, when using a Bonferroni critical value of $z = 2.42$, it was found that a number of the items cross-loaded on the two factors suggesting that the originally proposed one-factor model may also be of merit. See Table 17 for the IAT_{sex} proposed factor structure.

Table 17

Factor Structure of Internet Addiction Testsex

Item	Factor One	Factor Two
3. How often do you prefer the excitement of online sexual activity to intimacy with your partner?	.50	.13
4. How often do you form new relationships with fellow Internet sex site users?	.74	-.05
5. How often do others in your life complain to you about the amount of time you spend on Internet sex sites?	.87	-.13
6. How often do your grades or school work suffer because of the amount of time you spend on Internet sex sites?	.84	.00
7. How often do you check Internet sex sites before something else that you need to do?	.48	.41
8. How often does your job performance or productivity suffer because of online sexual activity?	.77	-.02
9. How often do you become defensive or secretive when anyone asks you what you do online?	.41	.38
12. How often do you fear that life without online sexual activity would be boring, empty, and joyless?	.51	.34
13. How often do you snap, yell, or act annoyed if someone bothers you while you are on Internet sex sites?	.70	.02
15. How often do you feel preoccupied with Internet sex sites when off-line, or fantasize about being on Internet sex sites?	.47	.40

19. How often do you choose to spend more time on Internet sex sites over going out with others?	.68	.19
20. How often do you feel depression, moody, or nervous when you are not on Internet sex sites, which goes away when you are back on Internet sex sites?	.72	.13

Table 17 continued

1. How often do you find that you stay on Internet sex sites longer than you intended?	-.03	.77
2. How often do you neglect household chores to spend more time on Internet sex sites?	.34	.44
10. How often do you block out disturbing thoughts about your life with soothing thoughts of online sexual activity?	.37	.47
11. How often do you find yourself anticipating when you will go on Internet sex sites again?	.30	.55
14. How often do you lose sleep due to late night online sexual activity?	.15	.66
16. How often do you find yourself saying, “just a few more minutes” when on Internet sex sites?	-.01	.85
17. How often do you try to cut down the amount of time you spend on Internet sex sites and fail?	.17	.54
18. How often do you try to hide how long you’ve been on Internet sex sites?	.12	.53

Three separate CFAs were conducted for the IAT_{sex}. First a CFA was conducted using the Phase Four data, combined sample, per the planned analyses. Second, two CFAs were conducted using the separated Phase Two and Phase Three samples in order to be consistent with the analyses conducted for the PCBS. Interestingly, the two-factor model was reported to be a good fit for the combined sample as measured by CFI = .93 and RMSEA = .05. The Phase Two sample reflected adequate, but weaker, fit with CFI = .87 and RMSEA = .06. Whereas, the Phase Three sample reflected a better fit than the both Phase Two and Phase Four samples with CFI = .94 and RMSEA = .05.

Sexual Compulsivity Scale. The SCS was reported to reflect a single factor model (Kalichman et al., 1994). Per the planned analyses, a CFA was conducted using the Phase Four sample. Two additional CFAs were conducted using the separate Phase Two and Phase Three samples in order to be consistent with the PCBS analyses. The Phase Four CFA yielded a good fit with the CFI = .94 and RMSEA = .07. The Phase Two CFA reported an adequate, but not strong, fit with CFI = .85 and RMSEA = .09. The Phase Three sample reported a good fit with CFI = .95 and RMSEA = .06. Cronbach's alpha was reported to be between .87 and .92 across the samples. Of note, this measure will not be compared against the PCBS, ISST, CPUI-9, and *IATsex* for use in Hypothesis Three as it was developed to measure offline problematic sexual behavior and is not inclusive of internet-related sexual behavior. See Table 18 for the SCS factor loadings.

Table 18

Factor Structure of Sexual Compulsivity Scale

Item	Factor One
1. My sexual appetite has gotten in the way of my relationships.	.61
2. My sexual thoughts and behaviors are causing problems in my life.	.61
3. My desires to have sex have disrupted my daily life.	.69
4. I sometimes fail to meet my commitments and responsibilities because of my sexual behavior.	.60
5. I sometimes get so horny that I could lose control.	.68
6. I find myself thinking about sex while at work.	.57
7. I feel that my sexual thoughts and feelings are stronger than I am.	.78
8. I have to struggle to control my sexual thoughts and behavior.	.72
9. I think about sex more than I would like to.	.66

10. It has been difficult for me to find sex partners who desire having sex as much as I want to.	.60
---------------------------------------------------------------------------------------------------	------------

Factor Structure Measure Comparison. Per the planned analyses, the measures that assessed cybersexual behavior were compared with regard to Cronbach's alpha, CFI, and RMSEA for the Phases Two and Three and combined sample. Measures were compared utilizing not just reliability, but also the factor analysis statistics in order to determine the consistency of the measures across samples and to effectively compare the measures using the same data set. With regard to these measures of fit, the measure that consistently demonstrated the most consistent factor structure was the CPUI-9 (CFI = .96-.98; RMSEA = .05). While the Cronbach's alpha for this measure with the Phase Four sample was lower than that of other measures, it was $\alpha = .91$ and is considered an internally consistent measure. Of note, this measure solely considered problematic online pornography use which may contribute to the measure's higher internal consistency than other measures. Specifically, high internal consistency likely reflects the singular behavior it is assessing for as opposed to the social and isolated cybersex that other measures assess for. The IAT_{sex} encompasses a wider variety of online sexual behaviors and demonstrated the most robust and consistent factor structure of the other three measures, all of which reflected a wider variety of online sexual behaviors (CFI = .84-.91; RMSEA = .06-.07). Inconsistent with Hypothesis One, these two measures have the strongest factor structures. See Table 19 for the comparison of all measures on CFI, RMSEA, and Cronbach's alpha.

Table 19

Confirmatory Factor Analyses for All Measures

Measure	Number of Factors	CFI	RMSEA	α
Problematic Cybersexual Behavior Scale				
Phase Two	4	.80	.06	.94
Phase Three	4	.85	.06	.96
Phase Four	4	.75	.05	.96
Internet Sex Screening Test				
Phase Two	4	.82	.04	.80
Phase Three	4	.84	.05	.87
Phase Four	4	.82	.05	.86
Cyberpornography Use Inventory-9				
Phase Two	3	.96	.05	.86
Phase Three	3	.98	.05	.92
Phase Four	3	.98	.05	.91
Internet Addiction Test _{sex}				
Phase Two	2	.87	.06	.94
Phase Three	2	.94	.05	.96
Phase Four	2	.93	.05	.96
Sexual Compulsivity Scale				
Phase Two	1	.85	.09	.87

Phase Three	1	.95	.06	.92
Phase Four	1	.94	.07	.91

Hypothesis Two

Hypothesis Two stated that the new measure of cybersexual addiction, the PCBS, was hypothesized to have greater criterion validation than the traditional measures of cybersexual addiction. This was tested by calculating correlations between the measures and the correlates and comparing the strength of the correlations using a Fisher's r to z transformation. The separate Phase Two and Phase Three data sets were used to assess the strengths of these relationships, due to the significant measurement variance between the two samples for the PCBS, as noted above. It was expected that all measures of cybersexual behavior/addiction would positively and significant correlate with the SI, UCLAS, CMPB- Drugs, CMPB- Alcohol, DASS-21, and DASS-21 subscales.

Variable correlations for Phase Two demonstrated significant correlations between all cybersexual/sexual addiction measures and the criterion variables. Notably, the PCBS ($r = .59, p < .01$), the ISST ($r = .48, p < .01$), the CPUI-9 ($r = .57, p < .01$), and the IAT_{sex} ($r = .61, p < .01$), correlated with the SCS, a measure of offline/in real-life problematic sexual behavior. Further, the measures of problematic sexual behavior correlated with the Shame Inventory, UCLA Loneliness Scale, and the Compulsive Internet Use Scale. However, in contrast with the hypothesis, the measures all demonstrated significant negative correlations with the CMPB Drug subscale and the CMPB Alcohol subscale. See Table 20 for the correlations.

Table 20

Phase Two Correlation Coefficients for Measures of Cybersex and Criterion Variables

	PCBS	ISST	CPUI-9	IAT _{sex}	SCS
Sexual Compulsivity Scale	.59**	.48**	.57**	.61**	-
Shame Inventory	.24**	.27**	.24**	.23**	.32**
UCLA Loneliness Scale	.28**	.24**	.16**	.19**	.23**
Composite Measure of Problem Behaviors	-.15**	-.15**	-.10*	-.25**	-.25**
Composite Measure of Problem Behaviors- Drugs	-.13**	-.13*	-.07	-.12*	-.22**
Composite Measure of Problem Behaviors-Alcohol	-.11*	-.11**	-.09	-.08	-.18**
Depression Anxiety Stress Scale-21	.37**	.29**	.25**	.29**	.37**
Depression Anxiety Stress Scale- Depression	.30**	.28**	.20**	.18**	.14**
Depression Anxiety Stress Scale- Anxiety	.23**	.17**	.15**	.15**	.04
Depression Anxiety Stress Scale- Stress	.25**	.25**	.19**	.20**	.13**
Compulsive Internet Use Scale	.29**	.26**	.31**	.33**	.38**

* $p < .05$, ** $p < .01$, *** $p < .001$

Similar to the Phase Two data, variable correlations for Phase Three demonstrated significant correlations between all measures of sexual/cybersexual addiction and the criterion. Notably, all four measures positively and significantly with the SCS (PCBS, $r = .79$, $p < .01$; ISST, $r = .68$, $p < .01$; CPUI-9 $r = .79$, $p < .01$; IAT_{sex}, $r = .86$, $p < .01$). This demonstrates a

significant relationship between cybersexual addiction and general levels of a sexual addiction in a community sample. Further, the measures of problematic sexual behavior correlated with the Shame Inventory, UCLA Loneliness Scale, and the Compulsive Internet Use Scale, demonstrating significant criterion validity. Consistent with the Phase Two data, the CMPB total score and Drugs and Alcohol subscales negatively correlated with the measures of online and offline sexual compulsivity. Again, this is inconsistent with previous research which demonstrated a positive relationship between sexual addiction and substance use. See Table 21 for the Phase Three correlation coefficients.

Table 21

Phase Three Correlation Coefficients for Measures of Cybersex and Criterion Variables

	PCBS	ISST	CPUI-9	IAT _{sex}	SCS
Sexual Compulsivity Scale	.79**	.68**	.79**	.86**	-
Shame Inventory	.61**	.55**	.57**	.62**	.64**
UCLA Loneliness Scale	.34**	.27**	.35**	.32**	.36**
Composite Measure of Problem Behaviors	-.19**	-.18**	-.14**	-.17**	-.18**
Composite Measure of Problem Behaviors-Drugs	-.17**	-.16**	-.12**	-.14**	-.16**
Composite Measure of Problem Behaviors-Alcohol	-.16**	-.16**	-.11*	-.16**	-.14*
Depression Anxiety Stress Scale-21	.55**	.44**	.48**	.52**	.55**
Depression Anxiety Stress Scale-Depression	.47**	.39**	.34**	.32**	.13*
Depression Anxiety Stress Scale-Anxiety	.56**	.46**	.46**	.34**	.12*

Depression Anxiety Stress Scale-Stress	.49	.40**	.39**	.30**	.12*
Compulsive Internet Use Scale	.59**	.49**	.56**	.58**	.58**

* $p < .05$, ** $p < .01$, *** $p < .001$

The correlation matrices were further compared using a Fisher's r to z transformation to determine if a single measure demonstrated greater criterion validity than the other measures. This method allows for z -scores to be determined and compared, establishing a p value to demonstrate significance of the difference between the two correlations. Measures of problematic sexual and cybersexual behavior were compared to each other, specifically the PCBS was compared to all established measures and the established measures were compared to each other. Of note, the measures all demonstrated correlations that were similar to each other, indicating consistency across measures in terms of their relationships to the correlates.

Problematic Cybersexual Behavior Scale. The PCBS was hypothesized to have greater criterion validity than the other measures. For Phase Two when compared to the ISST, the PCBS demonstrated a significantly stronger correlation with the SCS ($z = 3.08, p < .01$). Further, the PCBS demonstrated significantly stronger correlations in the Phase Two data with the UCLALS than the CPUI-9 ($z = 2.51, p < .01$) and the DASS-21 total scores than the CPUI-9 ($z = 1.90, p < .05$) and IAT_{sex} ($z = 1.90, p < .05$). Phase Three data demonstrated better criterion validity for the PCBS. When compared to the ISST, the PCBS reflected stronger correlation with the SI ($z = 4.82, p < .001$), the SI ($z = 1.80, p < .05$), the DASS-21 ($z = 2.91, p < .01$), the DASS-Depression ($z = 1.95, p < .05$), DASS-Anxiety ($z = 2.70, p < .05$), DASS-Stress ($z = 2.24, p < .05$), and the CIUS ($z = 2.82, p < .001$). Further, when compared to the IAT_{sex}, the Phase Three sample reflected stronger correlations between the PCBS and the DASS-Depression ($z = 3.33, p$

< .001), DASS-Anxiety ($z = 3.92, p < .001$), DASS-Stress ($z = 3.62, p < .001$). However, when compared to the *IAT_{sex}*, the PCBS demonstrated a significantly weaker correlation with the SCS ($z = -3.41, p < .001$). In sum, specifically with regard to the ISST, the PCBS did demonstrate better criterion validity than the other measures of cybersexual behavior across both Phase Two and Phase Three.

Inconsistent with Hypothesis Two, while the PCBS did demonstrate significantly greater criterion validity than several of the other measures, it did not demonstrate this consistently across the measure comparisons. This does not indicate a lack of criterion validity, but rather suggests that there is similar criterion validity across the measures with regard to these constructs. While the PCBS demonstrated significantly weaker correlations with several variables when compared to the SCS, the SCS measures offline sexual compulsivity and is a broader measure than the PCBS and other measures that specifically examine cybersexual behavior. Thus, the PCBS demonstrated significant positive relationships with all but the substance abuse measures suggesting adequate criterion validity.

Internet Sex Screening Test. The ISST demonstrated weaker criterion validity than other measures with regard to a number of the correlates. In Phase Two, the ISST demonstrated a weaker correlation with the SCS when compared to the PCBS ($z = -3.08, p < .01$). Phase Three data further demonstrated that the ISST had a weaker relationship with the SCS, than the CPUI-9 and SCS ($z = -2.48, p < .05$) and the *IAT_{sex}* ($z = 3.70, p < .001$). This suggests that the ISST's measurement of cybersexual addiction is not as closely related to overall sexual compulsivity as the other measures are. This sample also demonstrated that the ISST was less strongly correlated with the DASS-Anxiety than the *IAT_{sex}* ($z = 1.67, p < .01$). In Phase Three, the ISST demonstrated weaker correlations than the PCBS with the SCS ($z = -4.82, p < .001$), the SI ($z =$

-1.80, $p < .05$), the DASS-21 ($z = -2.91, p < .01$), the DASS-Depression ($z = -1.95, p < .05$), DASS-Anxiety ($z = -2.70, p < .05$), DASS-Stress ($z = -2.24, p < .05$), and the CIUS ($z = -2.82, p < .001$). Further, with Phase Three data the ISST demonstrated poorer criterion validity compared to the CPUI-9 with regard to the SCS ($z = -4.82, p < .001$), the UCLALS ($z = -1.76, p < .05$), and the CIUS ($z = -1.92, p < .05$). When compared to the IAT_{sex} similar results were found with regard to the SCS ($z = -9.23, p < .001$), SI ($z = -2.12, p < .05$), DASS-21 ($z = -2.07, p < .05$), and the CIUS ($z = 2.51, p < .01$). Overall, the weaker correlations the ISST demonstrated when compared to the other measures suggests that the ISST is not as closely related to the constructs of sexual compulsivity, shame, depression, anxiety, stress, and compulsive internet use. However, as expected in Hypothesis Two, the ISST still demonstrated significant correlations with the hypothesized correlates suggesting reasonable criterion validity for this measure.

Cyber-Pornography Use Inventory-9. The CPUI-9 demonstrated significant criterion validity compared to other measures across the Phase Two and Phase Three samples. In Phase Two, compared to the PCBS, the CPUI-9 produced a stronger correlation with the UCLALS ($z = 2.51, p < .01$) and a weaker correlation with the DASS-21 ($z = -1.90, p < .05$). Further, the CPUI-9 demonstrated a stronger relationship with the SCS than the ISST ($z = -2.48, p < .05$). With regard to Phase Three data the CPUI-9 demonstrated greater criterion validity compared to the ISST with regard to the SCS ($z = 4.82, p < .001$), the UCLALS ($z = -1.76, p < .05$), and the CIUS ($z = -1.92, p < .05$). When compared to the IAT_{sex} using Phase Three data, the CPUI-9 produced stronger correlations with the DASS-Depression ($z = 1.85, p < .05$), the DASS-Anxiety ($z = 2.53, p < .01$), and the DASS-Stress ($z = 2.10, p < .05$). Overall, the CPUI-9 demonstrated acceptable criterion validity when compared to other measures across the two samples. This means that the

measure is effectively assessing Internet pornography addiction and demonstrating significant relationships to the previously researched correlates of this behavior.

Internet Addiction Test_{sex}. The IAT_{sex} also demonstrated acceptable criterion validity when compared to the other measures using Phase Two and Phase Three data. For Phase Two, when compared to the PCBS, the IAT_{sex} produced weaker correlations with the UCLAS ($z = -1.90, p < .05$). When compared to the ISST using the Phase Two data, the IAT_{sex} demonstrated significantly stronger correlations with the SCS ($z = 3.70, p < .001$) and the DASS-Anxiety ($z = 1.67, p < .05$). With regard to Phase Three data, the IAT_{sex} demonstrated weaker correlations than the PCBS for the DASS-Depression ($z = -3.33, p < .001$), DASS-Anxiety ($z = -3.92, p < .001$), and the DASS-Stress ($z = -3.62, p < .001$). However, the IAT_{sex} demonstrated a stronger correlation with the SCS than the PCBS ($z = 4.41, p < .001$). Further, using Phase Three data the IAT_{sex} produced stronger correlations than the ISST with the SCS ($z = 9.23, p < .001$), the DASS-21 ($z = 2.07, p < .05$), and the CIUS ($z = 2.51, p < .01$). When compared to the CPUI-9 using Phase Three data, the IAT_{sex} produced weaker correlations with the DASS-Depression ($z = -1.85, p < .05$), the DASS-Anxiety ($z = -2.53, p < .01$), and the DASS-Stress ($z = -2.10, p < .05$). With regard to other measures, the IAT_{sex} did not produce significantly different correlations than other measures demonstrating that this measure has equivalent criterion validity with regard to those items. In sum, the IAT_{sex} demonstrated adequate criterion validity.

Measure Comparison. Hypothesis Two stated that the PCBS would demonstrate stronger criterion validity than the other measures and the results are consistent with that hypothesis. However, as the PCBS demonstrated both a weak factor structure and significant measure variance between the Phase Two and Phase Three samples, it is not an appropriate measure to be used for Hypothesis Three, which tests the predictive value of the correlates.

When comparing the other measures on criterion validity, no measure appears to consistently have stronger criterion validity than the others. Per the proposed analyses, the measure with the strongest factor structure and best criterion validity will be used to conduct the Hypothesis Three analyses.

With regard to overall factor structure, two measures of online sexual behavior demonstrated good model fit and were examined further for use in Hypothesis Three. The subsequent information is based on data from the combined sample, Phase Four. The CPUI-9 had a good model fit using the previously identified three-factor model (CFI = .98, RMSEA = .05) implying this measure has an appropriate factor structure. Further, as stated above it demonstrated criterion validity across the measures of offline sexual compulsivity, shame, loneliness, depression, anxiety, stress, and compulsive internet use. The IAT_{sex} also produced an acceptable two-factor model fit with CFI = .93 and RMSEA = .05. In addition, this measure demonstrated acceptable criterion validity with regard to the above stated measures. Of note, when comparing the CPUI-9 and IAT_{sex} with regard to criterion validity using the Phase Four, or combined Phase Two and Phase Three samples, the only difference in criterion validity reported was a stronger correlation between the IAT_{sex} and SCS than the CPUI-9 ($z = 2.41, p < .01$).

As no other significant differences were found for the Phase Four sample with regard to criterion validity, it can be stated that the two measures evidenced similar, adequate criterion validity. Of note, the CPUI-9 solely assesses for problematic Internet pornography use, whereas the IAT_{sex} assesses for more general problematic online sexual behavior. Implications of these findings were reviewed in the discussion. The IAT_{sex} was utilized for the analyses conducted in Hypothesis Three as it produced an adequate model fit, acceptable criterion validity, and more

broadly assesses for online sexual behavior as compared to the CPUI-9. See Table 22 for the Phase Two z-score comparisons and Table 23 for the Phase Three z-score comparisons.

Table 22

Phase Two Z-score Correlation Differences Across Measures

Measure	PCBS ISST	PCBS CPUI-9	PCBS IAT _{sex}	PCBS SCS	ISST CPUI-9	ISST IAT _{sex}	ISST SCS	CPUI-9 IAT _{sex}	CPUI-9 SCS	IAT _{sex} SCS
Sexual Compulsivity	3.08**	.60	-.60	-	-2.48**	-3.70***	-	-1.22	-	-
Scale										
Shame Inventory	-.64	.00	.21	-1.73*	.64	.85	-1.09	.21	-1.73*	-1.94*
UCLA Loneliness Scale	.85	2.51**	1.90*	1.06	1.66*	1.04	.21	-.62	-1.45	-.83
Composite Measure of Problem Behaviors-Drugs	.00	-1.21	-.20	-1.85*	-1.21	-.20	-1.85*	-1.00	-3.05**	-2.05*
Composite Measure of Problem Behaviors- Alcohol	.00	-.40	-.60	-1.42	.40	.60	1.42	.20	1.82*	-2.02
Depression Anxiety Stress Scale	.65	.86	.00	-1.79*	.21	-.65	-2.43**	-.86	-2.65**	-.66
Depression	.43	1.08	.22	-.44	.64	-.22	-.87	-.86	-1.52	-1.79*
Anxiety	1.24	.63	-.42	-2.16*	-.62	-1.67*	-3.40***	-1.05	-2.79**	-1.74
Stress	.00	.84	.42	-2.19*	.84	.42	-2.19*	-.42	-3.03**	-2.61**
Compulsive Internet Use Scale	.65	-.44	-.88	-2.02*	-1.08	-1.53	-2.66**	-.44	-1.58	-1.14

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 23

Phase Three Z-score Correlation Differences Across Measures

Measure	PCBS ISST	PCBS CPUI-9	PCBS IAT _{sex}	PCBS SCS	ISST CPUI-9	ISST IAT _{sex}	ISST SCS	CPUI-9 IAT _{sex}	CPUI-9 SCS	IAT _{sex} SCS
Sexual Compulsivity Scale	4.82***	.00	-4.41***	-	-4.82***	-9.23***	-	-4.41***	-	-
Shame Inventory	1.80*	1.22	-0.37	-.98	-.58	-2.12*	2.78**	-1.54	-2.20*	-.66
UCLA Loneliness Scale	1.54	-.23	.45	-.45	-1.76*	-1.09	-1.99*	.67	-.23	-.90
Composite Measure of Problem Behaviors- Drugs	.20	1.02	.61	.20	.81	.41	.00	-.40	-.81	-.41
Composite Measure of Problem Behaviors- Alcohol	.00	1.01	.00	.41	1.01	.00	.41	-1.01	.00	.41
Depression Anxiety Stress Scale	2.91**	1.90*	.84	.00	-1.01	-2.07*	-2.91**	-1.06	-1.90*	-.83
Depression	1.95*	1.48	3.33***	.00	-.47	1.37	-1.95*	1.85*	-1.48	-3.32***
Anxiety	2.70**	1.39	3.92***	-.59	1.30	1.23	-3.28***	2.53**	-1.98*	4.50***

Stress	2.24*	1.51	3.62***	.00	-.72	1.38	-2.24*	2.10*	-1.51	-3.61***
Compulsive Internet Use Scale	2.82**	.89	.30	.30	-1.92*	-2.51**	-2.51**	-.59	-.59	.00

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis Three

Hypothesis Three stated that the correlates of offline sexual compulsivity, shame, loneliness, substance use, depression, and anxiety would each significantly predict problematic cybersexual behavior. In order to examine this question, a series of linear regressions were conducted prior to a forced entry multiple regression analysis to determine what set of correlates best predicted this behavior in the Phase Four samples. As the research is limited, no a priori hypotheses about the multiple regression were made. The IAT_{sex} was utilized in Hypothesis Three as it demonstrated the best model fit and strongest criterion validity of the inclusive measures of cybersexual behavior. Further, the Phase Four, or combined data, were utilized for Hypothesis Three in order to both be consistent with the planned analyses. Separate analyses of the Phase Two, university, and the Phase Three, general online population, to determine the differences between each group are beyond the scope of the current study.

As evidenced in Table 24 below, all measures demonstrated statistically significant predictive power when using the IAT_{sex}. Simple linear regression analyses determined that online sexual compulsivity, as measured by the IAT_{sex}, was positively predicted by offline sexual compulsivity ($F(1, 791) = 1389.04, p < .001, R^2 = .63$), shame ($F(1, 791) = 190.72, p < .001, R^2 = .19$), loneliness ($F(1, 791) = 45.49, p < .000, R^2 = .05$), depression ($F(1, 791) = 133.00, p < .001, R^2 = .14$), anxiety ($F(1, 791) = 146.74, p < .001, R^2 = .15$), and compulsive Internet use ($F(1, 791) = 240.16, p < .001, R^2 = .23$). A regression was also conducted using the DASS-Stress for exploratory purposes and found that stress also significantly predicts high rates of problematic cybersexual behavior, $F(1, 791) = 100.72, p < .001, R^2 = .11$. The DASS-21 total score was not included in order to more specifically examine the separate predictive value of the Depression and Anxiety subscales. Consistent with the previously noted negative correlations

between online sexual behavior and substance abuse, the CMPB-Drugs subscale also produced significant negative predictive value ($F(1, 791) = 11.69, p < .01, R^2 = .01$) as did the CMPB-Alcohol ($F(1,791) = 7.60, p < .01, R^2 = .01$). Similar to the DASS-21 total score, the CMPB total scale score was not used in the linear regression, as it was deemed important to examine drugs and alcohol separately for their predictive value consistent with previous literature and the entire measure was not given to participants (Perera et al., 2009; Stavro et al., 2013).

Table 24

Linear Regression Analyses for Correlates

	B	SE B	β	t	R^2 Change
Sexual Compulsivity	2.36	.06	.79	32.27	.63
Shame Inventory	.21	.01	.44	13.81	.19
UCLA Loneliness Scale	.30	.04	.23	6.74	.05
Drug Use	-.28	.08	-.12	-3.42	.01
Alcohol Use	-.29	.10	-.09	-2.75	.01
Depression	1.30	.11	.37	11.53	.14
Anxiety	1.54	.12	.39	12.11	.15
Stress	1.22	.12	.33	10.03	.11
Compulsive Internet Use	.75	.04	.48	15.49	.23

As each of the correlate measures predicted problematic cybersexual behavior as measured by the IAT_{sex}, each measure was entered into the forced regression analysis. Of note, multicollinearity statistics were analyzed, and it was determined that within this dataset the variables did not present with significant multicollinearity.

Two separate forced entry regression analyses were conducted with the first including the SCS and the second controlling for the SCS to better understand the influence of the other correlates. The initial multiple regression demonstrated that when considered together, offline sexual compulsivity, depression, stress, and compulsive Internet use significantly predict online sexual compulsivity, $F(9,781) = 163.93$, $p < .001$, $R^2 = .65$, whereas the other variables were non-significant. See Table 25 for the full regression analysis without controlling for the SCS.

Table 25

Hierarchical Regression Analysis

	B	SE B	β	t	p
Sexual Compulsivity	2.16	.07	.73	27.67	<.001
Shame Inventory	.02	.01	.04	1.53	.12
UCLA Loneliness Scale	-.04	.03	-.03	-1.30	.19
Drug Use	.02	.05	.01	.44	.65
Alcohol Use	.07	.07	.02	1.05	.29
Depression	.30	.12	.08	2.35	.01
Anxiety	.17	.15	.04	1.15	.24
Stress	-.41	.15	-.11	-2.72	<.01
Compulsive Internet Use	.15	.04	.10	3.71	<.001

A hierarchical regression analysis was then conducted controlling for offline sexual compulsivity to determine the predictive value of the other correlates separate from the variance accounted for by the SCS. This model found that offline sexual compulsivity contributed 63.8% of the predictive variance, whereas the additional correlates contributed an additional 1.5% of the

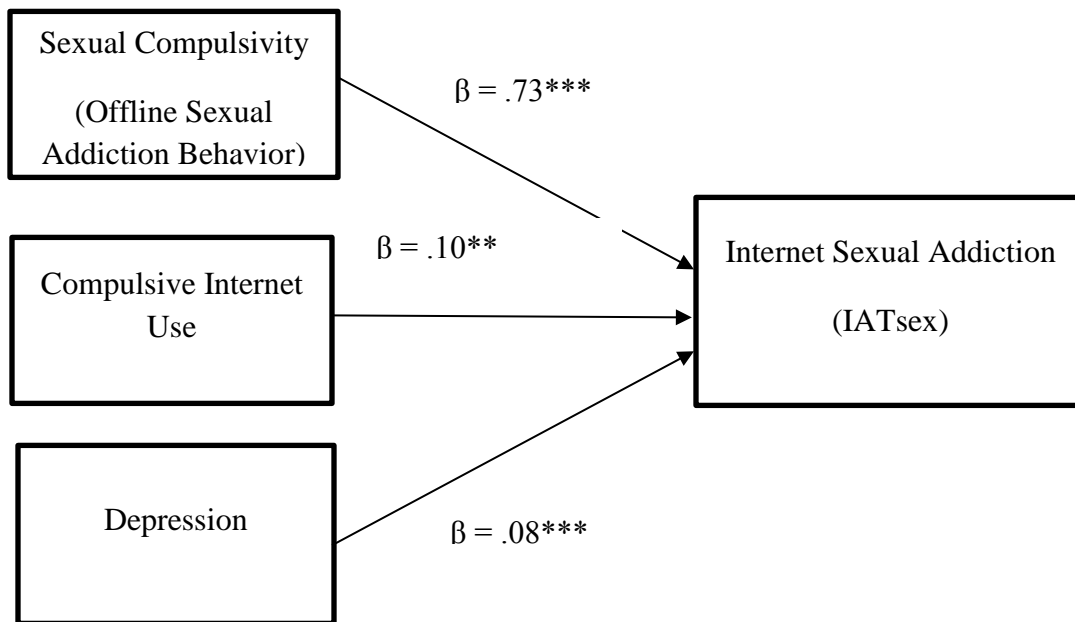
variance. As seen in Table 26, the regression analysis did not reflect any differences in the other variables' contribution even when controlling for sexual compulsivity.

Table 26

Hierarchical Regression Analysis Controlling for Sexual Compulsivity

	B	SE B	β	t	p
Shame Inventory	.02	.01	.04	1.53	.12
UCLA Loneliness Scale	-.04	.03	-.03	-1.30	.19
Drug Use	.02	.05	.01	.44	.65
Alcohol Use	.07	.07	.02	1.05	.29
Depression	.30	.12	.08	2.35	.01
Anxiety	.17	.15	.04	1.15	.24
Stress	-.41	.15	-.11	-2.72	<.01
Compulsive Internet Use	.15	.04	.10	3.71	<.001

As no differences were found when controlling for the SCS, a multiple regression was conducted using only the items that contributed significantly to the model. It was found that the DASS-Depression no longer contributed significant variance and was removed from the model. Subsequently, the DASS-Stress no longer contributed significant variance. Thus, the final model included solely the Sexual Compulsivity Scale and the Compulsive Internet Use Scale which produced significant predictive value $F(1, 789) = 723.25, p < .001, R^2 = .64$. These two variables, when considered together, accounted for 64.6% of the variance. See Figure 2 for the regression model.



Note. $*p < .05$, $**p < .01$, $***p < .001$.

Figure 2. Forced entry regression model.

Hypothesis Three proposed no a priori hypotheses about the predictive value of the other measures and was for exploratory purposes. In conclusion, offline sexual compulsivity was demonstrated to be the most significant predictor of problematic online sexual behavior. While depression, stress, and compulsive internet use demonstrated significant predictive value within this model, they did not appear to contribute a large amount of variance to said model. Together, the SCS and CIUS predicted 64.6% of the variance and produced the strongest predictive model of problematic online sexual behavior.

Discussion

This study sought to validate a new measure of cybersexual addiction/problematic cybersexual behavior, examine the correlates of this construct, and assess for the predictive value of said correlates. Specifically, the study aimed to create a measure of cybersexual behavior that was based upon the proposed diagnostic criteria for hypersexual disorder (Kafka, 2010). One of the main problems facing validation of this construct and preventing inclusion in the DSM-5 is the lack of consistently utilized and empirically supported diagnostic criteria. In an effort to support the inclusion of hypersexual disorder in future diagnostic manuals, this study aimed to begin examining the validity of Kafka's 2010 proposed criteria for use with cybersexual disorder by developing a measure of cybersexual addiction based on these criteria. Further, this measure aimed to include all types of cybersexual behavior in contrast to the CPUI-9, which solely assessed for pornography use. While this measure did not produce the hypothesized factor structure, there are a number of useful implications of the results of this study for both researchers and clinicians.

Development of the Problematic Cybersexual Behavior Scale

Hypothesis 1 stated that the PCBS would evidence a five-factor model and have a more robust structure than the other measures. The initial five factors were proposed to be consistent with each of the main criteria, with Criteria A2 and A3 combined and the addition of Criterion B as a separate factor, proposed by Kafka (2010). A four-factor model was, instead, found to best fit the Phase One data, even though it still demonstrated a poor model fit ($CFI = .89$). Specifically, the four factors that were extracted were identified as Logistical Consequences, Urgency, Emotional Consequences/Attempts to Stop, and Increased Risk Taking. Each factor's relation to the diagnostic criteria is further examined below.

Factor One, Logistical Consequences, is consistent with criterion B of the proposed hypersexual disorder diagnostic criteria which assesses for impairment related to functioning (Kafka, 2010). Logistical Consequences refers to the questions assessing for consequences specific to academic, work, and relationship impairment. These questions are consistent with the previously developed measures that assessed for these types of consequences and as stated above reflects Criterion B of the diagnostic criteria used to develop the PCBS (Brand et al., 2011; Delmonico & Miller, 2003; Grubbs et al., 2015; Kafka, 2010).

Factor Two appeared to encompass a construct that has not yet been addressed in the sexual addiction literature, urgency. Per Billieux, Gay, Rochat, and Van der Linden (2010), urgency is defined as, “the facet of impulsivity that refers to individual differences in the proneness to act impulsively and rashly in emotional contexts” (Cyders & Smith, 2008; Whiteside & Lynam, 2001). The items for Factor Two consist of questions that assess whether the individual is engaging in this behavior in response to intense negative emotions (e.g., Item 5, “when I am stressed, I often engage in online sexual behavior”), and items that assess for the consequences of these behaviors (e.g., Item 32, “I have stayed up past when I wanted to in order to access online sexual material”), aspects that are included in the definition of urgency (Cyders & Smith, 2008). Previous literature has found that positive urgency, or the propensity to overreact to positive feeling, is related to risky sexual behavior (Cyders et al., 2007; Zapolski, Cyders, & Smith, 2009), but nothing appears to have been published assessing this construct’s relationship to cybersexual behavior. However, it should be noted that a criterion of the proposed hypersexual disorder diagnosis includes an escalation in the risks taken by individuals involved in this behavior. Thus, the appearance of urgency in this factor structure is not inconsistent with the previous literature (Cyders et al., 2007; Zapolski et al., 2009). Interestingly, previous

literature has suggested that sexual and cybersexual addiction are constructs more closely related to impulse control disorders than to addictions (Barth & Kinder, 1987; Grant, Levine, Kim, & Potenza, 2005). The appearance of this factor in the measure suggests that further examination of the etiology of cybersexual addiction is needed. Future research on both cybersexual addiction and refinement of the PCBS should more closely examine the role of impulsivity, specifically the sub-construct of urgency, in this behavior.

The third factor, Emotional Consequences, contained items that assessed for both emotional consequences of problematic cybersexual behavior and attempts to stop. This reflects both criterion A4 and part of Criterion B of the proposed diagnostic criteria (Kafka, 2010). It is hypothesized that these two sets of items produced the same factor, as the emotional consequences of this behavior are what is driving the attempts to stop. This is consistent with previous literature that found a positive relationship between feelings of shame and treatment seeking for pornography addiction in religious populations (Kwee et al., 2007; Kort, 2004; Nelson, 2003; Reid et al., 2009). Interestingly, none of these items produced significant cross-loading with Factor One, providing further support for the separation of more logistical consequences and the emotional consequences of the behavior. As there is little research examining what leads to help seeking behaviors with regard to cybersex, this finding demonstrates the need for additional research examining what predicts individual help-seeking.

Factor Four, labeled as Increased Risk-taking, is consistent with Criterion A5 of the proposed diagnostic criteria (Kafka, 2010). This criterion specifies that individuals increased the risks they take with their sexual behavior without regard for the emotional and physical safety of self and others. This factor included items that assessed for the use of an individual's real name, posting materials of themselves, and engaging in this behavior even when uncomfortable.

Previous literature has suggested that individuals who engage in problematic cybersex evidence a behavior similar to tolerance in substance use disorders (Laier, Pawlikowski, & Brand, 2014). Specifically, these individuals increase the risks taken and the intensity of the material they view in order to achieve the same arousal (Laier et al., 2014). This suggests that the previously proposed addiction model of cybersexual and sexual addiction is worth further examination (Goodman, 2001; Kor, Fogel, Reid, & Potenza, 2013). Interestingly, the item with the lowest factor loading was Item 30: “I have posted sexual material of myself online.” This factor loading should be discussed and examined further in future research, as the prevalence of sharing sexualized photos of one’s self is not an uncommon practice in youth samples, with one survey based study of 5,907 youths ages 13–18 finding that 7% of the sample had shared a sexual photo of themselves in the past year (Ybarra & Mitchell, 2016). The exchange of sexualized material of the self via various apps and texting occurs is viewed as a safer alternative to other sexual behaviors and may be occurring in higher rates in youth populations than with older adults (Ybarra & Mitchell, 2016). Within this context, this behavior may not be consistent with the construct of cybersexual addiction and additional research is needed examining this among young adults.

Overall, the PCBS did not demonstrate a strong factor structure, but the overall factor structure of the measure supports further refinement of this measure. Items remained in the final measure that assess for tolerance or increase in risk taking (e.g., Item 15 “I am engaging in riskier online sexual behavior than I was when I first started”) and withdrawal (e.g., Item 14 “If I do not have access to online sexual material, I feel anxious, upset, or angry”). The inclusion of these items continues to support the conceptualization of this pathology as an addiction (Barth & Kinder, 1987; Goodman, 1998).

The lack of fit of the factor structure may reflect both problems with the diagnostic criteria and the sample collected. The factor structure did not fit Kafka's proposed diagnostic criteria in the way expected and produced four factors that reflected logistical consequences, urgency, emotional consequences/attempts to stop, and increased risk taking rather than the hypothesized five factors. However, this measure is the only measure to assess for all the proposed criteria in the hypersexual disorder diagnostic criteria and the final items did reflect all the diagnostic criteria (Kafka, 2010). This suggests that while the diagnostic criteria show promise for the use in diagnosis, additional research is needed to understand the etiology behind each criterion whether each is related to impulse control or addiction. The samples collected also likely affected the model development and validation of the factor structure of the PCBS. First, the Phase Three sample had significantly higher scores on the PCBS than the Phase One and Phase Two Samples. As this difference was not reflected in the other measures and the overall time spent on online sexual behavior per week was not significantly different, this may be attributable to item level concerns in the PCBS. Specifically, the wording of the items, either due to nuance or difficult wording may be impacting the individual's report of symptoms. Further, the Phase Two and Phase Three samples demonstrated significant variance for the PCBS. This demonstrates that certain items on the measure were not assessing for the same construct across the samples. While further examination of the specific items that contributed to this variance was beyond the scope of this study, any further refinement of the PCBS should include an item level analysis of measurement invariance. In addition, the other three measures of cybersexual behavior validated their measures on varying populations including students (CPUI-9; Grubbs et al., 2015), individuals recruited from an online ad (IATsex, Brand et al., 2011), and individuals recruited from a sexual help focused website (ISST, Delmonico & Miller, 2003). As this measure

was validated on a non-cybersex addiction population, in order to be consistent with the previous literature, further refinement should examine a sample of individuals known to be engaged in problematic cybersex. Additional research examining the use of each of these measures with university students and online populations is also needed to determine if specific measures are more appropriate for certain populations.

Factor Structure of Other Measures

The factor analyses of the other measures produced interesting findings both consistent and inconsistent with the previous literature (Brand et al., 2011; Delmonico & Miller, 2003; Grubbs et al., 2015). While the ISST historically produced an acceptable model fit using a five-factor model (Delmonico & Miller, 2003), the original factor structure found by the authors produced poor fit when examined using the Phases Two, Three, and Four samples in the current study. Instead, an EFA found a four-factor structure, which included Logistical Consequences, Urgency, Emotional Consequences, and Risk-Taking, with acceptable fit indices which ultimately failed to produce a good model fit in the subsequent CFA. This difference may be due to differences in the samples as the original authors utilized a sample of individuals collected from an online sexual help focused website, whereas this study recruited from research or task-focused websites for students or the general population who reported low rates of cybersex and time spent on cybersex (Delmonico & Miller, 2003). Another consideration is that the initial model found by Delmonico and Miller (2003) was a model based on theory in order to cleanly reflect the types of behavior and consequences. This suggests the need for additional research validating the factor structure of the ISST for use in both clinical and non-clinical populations, as it is one of the only current measures of cybersexual behavior that assesses both isolated and social types of cybersexual behavior (Delmonico & Miller, 2003).

The measure that produced the best model fit was the measure that solely examined pornography use, the CPUI-9 (Grubbs et al., 2015). This suggests that additional research is needed, that examines the differences between isolated cybersexual behavior, e.g., pornography use, and social cybersexual behavior, e.g., camming or chat rooms, as these two types of cybersexual behavior have yet to be examined thoroughly in the empirical literature, and the measures that assessed for cybersex more broadly produced poorer fit (Delmonico & Miller, 2003). These two constructs have been separated out in the subscales of the ISST specifically as previous research has suggested that females are more likely to engage in social cybersexual behavior, whereas males are more likely to engage in isolated behaviors (Cooper et al., 2000; Delmonico & Miller, 2003). The authors of the CPUI-9 specifically narrowed this measure from the CPUI (Grubbs et al., 2010), in order to demonstrate better consistency and assess for this specific behavior (Grubbs et al., 2015). Their decision and the subsequent results of this study point to a possible difference between the constructs of isolated and social cybersexual behavior.

Interestingly, of the three measures that assessed for all areas of cybersexual behavior, the measure that produced the best model fit was the *IAT_{sex}*. At the time of proposal, this measure was used in a single published study and was modified directly from the Internet Addiction Test (Brand et al., 2011). However, as of 2017, this measure has been shortened to the *Short-IAT_{sex}* and been further validated and utilized in a number of studies (Laier, Pekal, & Brand, 2015; Snagowski & Brand, 2015; Snagowski, Laier, Duka, & Brand, 2016; Wéry, Burnay, Karila, & Billieux, 2016). The strong model fit and good criterion validity of this measure suggests that the two constructs of both Internet addiction and cybersexual addiction are more closely tied together than previously thought (Griffiths, 2001; Young, 1999). The two-factor structure extracted from the current study data reflected time spent and consequences of

the online behavior, which is consistent with the more recent studies examining the factor structure of the Short-IAT_{sex} (Wéry, Burnay, Karila, & Billieux, 2016). The study examined 401 French speaking males in a survey based study that aimed to validate a French version of the Short-IAT_{sex}. They found that the two factors extracted reflected Loss of Control/Time Management and Craving/Social Problems (Wéry, Burnay, Karila, & Billieux, 2016). While the current study utilized the original form IAT_{sex}, the factor structure remained consistent across the two measures. This two-factor structure containing both time spent and consequences of the behavior is also consistent with the development of others measures, specifically the initial literature developing the CPUI-9 measure as the authors found that compulsivity and consequences were the main two constructs extracted from the original CPUI factor structure (Grubbs et al., 2010; Grubbs, Volk, Exline, Pargament, 2015). Notably, the IAT_{sex} is not inclusive of all the proposed hypersexual disorder diagnostic criteria and specifically excludes Criteria A3, “repetitively engaging in sexual fantasies, urges, or behaviors in response to stressful life events,” and A5, “repetitively engaging in sexual behaviors while disregarding the risk for physical or emotional harm to self or others” (Kafka, 2010). These types of items are not included in the Short-IAT_{sex} either (Laier, Pekal, & Brand, 2015). This suggests that while these two facets are integral to the addiction model of this diagnosis, it’s inconsistent with the measure that demonstrated the best fit, which suggests the need for further examination of the symptoms and etiology of cybersex addiction.

Correlates of Cybersexual Behavior

Several correlates of cybersexual addiction were examined including offline sexual compulsivity, shame, loneliness, depression, anxiety, stress, drug abuse, alcohol abuse, and compulsive internet use. Interestingly, all measures of sexual/cybersexual addiction

demonstrated similar correlations to the proposed correlates with regard to both direction and strength of the correlations. This suggests that there is considerable consistency in the conceptualization of cybersexual addiction as measured by the PCBS, CPUI-9, ISST, IAT_{sex}, and SCS. This is further supported by the consistently significant positive correlations between the measures of cybersexual behavior, whether they assessed for broad cybersex behaviors or specifically for pornography use.

Consistent with the hypotheses and previous research, offline sexual compulsivity, as measured by the SCS, was found to be correlated with high rates cybersexual addiction behavior (Daneback et al., 2006; Wetterneck et al., 2012). Both of the previous survey-based studies found that individuals who were classified as sexually compulsive, as measured by the SCS, were significantly more likely to spend large amounts of time online in pursuit of sexual material than individuals not classified as sexually compulsive (Daneback et al., 2006; Wetterneck et al., 2012). Of note, the SCS measures for sexual addiction and does not specify between online and offline behaviors, and thus has been used in previous studies in addition to time spent on online sexual behavior to assess for cybersexual addiction (Cooper et al., 1999; Daneback et al., 2006; Perry et al., 2007). The positive correlation between the measures of cybersexual addiction and the SCS suggests that this may be an appropriate use of this measure, but as this does not specifically ask about Internet-related concerns, such as computer use and Internet history, the measures of cybersexual-specific addiction are most appropriate for assessing for cybersex addiction. Given that this measure looks at sexual addiction more generally, the strong correlation between this measure and that of cybersexual behaviors supports the hypothesis that individuals move offline sexual addiction into the online realm (Griffiths, 2001). This relationship suggests the needs for future empirical studies to assess more specifically for the

relationship offline sexual addiction behaviors and cybersexual behaviors. As previous researchers have differentiated between at-risk and compulsives by denoting which individuals have offline compulsivity problems, this relationship between offline and online sexual addiction behaviors needs further examination (Cooper et al., 1999). As this study did not specifically look at these two groups separately and sampled a general university student and online population, both of which reported an average under 2 hours of cybersexual behavior per week, it is unclear if the relationship between the SCS and the other measures of cybersexual behavior would look the same in individuals with high or low levels of cybersexual addiction. However, of note, because the SCS does measure for broad sexual addiction concerns, this provided additional criterion validity for the PCBS and other measures of cybersexual addiction.

As hypothesized, the construct of shame was found to be positively correlated with cybersexual and offline sexual addiction behaviors across the measures. This is consistent with the previous research that has demonstrated positive correlations between the two constructs (Gilliland et al., 2011; Reid et al., 2009). Further, this was consistent across both the Phase Two and Phase Three samples, suggesting that the relationship between shame and cybersexual addiction behaviors is consistent for both university students and the general population. Researchers have previously theorized that shame plays a role in the development of cybersexual addiction and sexual addiction (Kort, 2004; Reid et al., 2009), and this study's results support this conceptualization. This relationship may occur in different patterns that future research may consider. Specifically, it can be hypothesized that individuals may either be turning to cybersexual materials to alleviate the difficult emotion of shame and/or it can be hypothesized that individuals continue to struggle with cybersexual addiction due to feelings of shame around treatment seeking (Gilliland et al., 2011). Thus, as previously hypothesized by researchers

examining Christian populations, shame itself may create a cyclical effect in which one continues to be drawn into cybersexual behavior both in avoidance of treatment seeking and to avoid confronting the feelings of shame (Kort, 2004; Kwee et al., 2007). Future research may want to consider assessing for both shame related to life events, such as measured by the Shame Inventory, and sexual-behavior related shame and to examine changes over the course of treatment or addiction development (Rizvi, 2010).

Consistent with the hypothesis, loneliness was found to be positively correlated with high rates of online sexual behavior. This is also consistent with previous literature looking at the relationship between these two constructs (Chaney & Dew, 2003; Chaney & Burns-Wortham, 2015; DeLonga et al., 2011; Guigliano, 2006; Yoder et al., 2005). The relationship between these two constructs may be one in which loneliness precedes the cybersexual addiction behavior as theorized by Yoder, Virden, and Amin (2005) and supported by an interview-based study by Guigliano (2006). This study interviewed homosexual-identified males about their engagement in and motivation for cybersexual behavior and found that a desire for social connection was consistently reported as a motivating factor for engaging in cybersex (Guigliano, 2006). While the current study found that loneliness positively predicted cybersexual addiction behavior, loneliness is also likely to play a role in maintaining this behavior as the person continues to isolate and retreats into more frequent cybersexual behavior to manage the feelings of loneliness. This process is similar to what has been theorized to be the relationship between depressive symptoms and cybersex for depressive-type at-risk users, in which the social isolation drives the cybersexual behaviors (Cooper et al., 1999). Future research should examine the role of loneliness specifically for this type of cybersex user. Further, as this study did not differentiate between isolated cybersexual behavior, i.e., pornography, or social cybersexual behavior, i.e.

chat rooms or camming, future research should consider the role of loneliness in both social and isolated cybersex.

Significant positive relationships were found between the subscales of the DASS-21 and cybersexual addiction levels. Consistent with previous research, a positive relationship was found between depression and cybersexual behavior (Kafka & Hennen, 2002). This is also consistent with the depressive-type at-risk user of cybersex who are hypothesized to experience higher rates of depression as they spend increased amounts of time on cybersex (Cooper et al., 1999). Further, the regression analyses demonstrated that depression significantly predicted high rates of cybersexual behavior. Again, this is consistent with the previous literature identifying the at-risk group of individuals as depressive types, and the research examining mood disorders and sexual addiction behaviors (Cooper et al., 1999; Kafka & Hennen, 2002). Consistent with the findings of the current study, two studies have found higher rates of depression among individuals engaged in problematic cybersex when compared to individuals with other types of Internet or sex addiction (Corley & Hook, 2012; Laconi et al., 2015). First, a survey based study of 657 females found that those identified as problematic cybersex users reported higher levels of depression than both participants who identified as having a sex or love addiction and those who identified as neither (Corley & Hook, 2012). Second, a study of individuals with problematic Internet use found that those who were identified as having problematic cybersexual behavior experienced significantly higher rates of depression than individuals with other problematic Internet behaviors, such as gambling or shopping (Laconi et al., 2015).

In addition to depression, a positive relationship was found between anxiety and cybersexual behavior, reflecting consistency with the previous research that found individuals identified as having sex addiction reported high rates of anxiety (Kafka & Hennen, 2002). As the

DASS-21 solely looks at overall levels of anxiety, future research should consider looking specifically at social anxiety and its relationship to both isolated and social cybersexual behaviors. Stress also demonstrated a positive correlation with rates of cybersexual behavior/addiction and positively predicted cybersexual behavior in simple regression. This is consistent with previous literature that hypothesizes about the at-risk stress-reactive type of individual engaged in problematic cybersexual behavior (Cooper et al., 1999). Individuals who fall into this category are hypothesized to turn to cybersexual behavior during periods of high stress, which is also consistent with the proposed diagnostic criteria (Kafka, 2010). Previous research has demonstrated that individuals may turn to cybersex to cope with difficult emotions. Specifically, a study of 71 homosexual males found that coping by sexual behaviors was related to high rates of cybersexual behavior and it was theorized that coping in this manner may contribute to cybersex addiction (Laier, Pekal, & Brand, 2015). Thus, the current study's results which demonstrate that depression, anxiety, and stress each positively predict rates of problematic cybersex are consistent with and support the hypothesis that individuals use this behavior to cope with unpleasant emotions. Future research should consider the differing roles of state and trait anxiety and depression to assess for the contributing role of overall pathology versus event specific distress. In sum, this study supports the previous literature associating mood and anxiety disorders with sexual addiction behaviors and provides support for the theorized at-risk type of cybersex user.

Compulsive Internet use was found to be significantly positively correlated with and to predict high rates of cybersexual behavior in this sample. Interestingly, previous literature has demonstrated that large amounts of time spent on cybersex predicts higher rates of Internet addiction (Meerkerk et al., 2006). The direction of the previous research results suggests that

individuals reporting high rates of Internet addiction may be more likely to develop cybersexual addiction problems, consistent with Young's model (1999). However, this study found that compulsive Internet use positively predicts cybersex addiction and thus supports Griffiths' hypothesis that individuals are acting out a sexual addiction in the online realm (2001). The relationship between these two constructs supports the importance of considering both sexual addiction diagnostic criteria and Internet addiction criteria (Tao et al., 2011) in diagnosing cybersexual addiction. Further, this relationship is consistent with the previous literature that has pointed out the importance of the Triple-A Engine, or accessibility, affordability, and anonymity of the Internet, in the development of cybersexual addiction (Cooper, 1998). This result and previous research demonstrates the importance of understanding not only the function of the sexual behavior in the development of cybersexual addiction but also the factors of Internet use and addiction that can maintain this.

Inconsistent with the previous research on offline sexual compulsivity, substance use, both drug and alcohol use, was found to be negatively correlated with high rates of problematic cybersexual behavior. The previous literature found significant correlation between these substance abuse and sex addiction, particularly stimulant use (Perera et al., 2009 ; Stavro et al., 2013). The difference demonstrated in the current results may be related to the lack of literature looking specifically at the relationship between cybersexual behavior and substance use, as the previous studies looked at offline sexual addiction. It is also possible that the current results may be due to the population selected for study. Several previous studies that demonstrated positive correlations sampled from substance abuse clinics (Stavro et al., 2013) or treatment centers for sexual addiction (Opitz et al., 2009). It was theorized by researchers that this was due to "addiction hopping" behaviors (Carnes, 1983). As this study utilized a non-clinical sample of

university students and an online self-selecting population, this difference in populations may be reflected in the negative correlations found due to the lower levels of overall addictive behaviors. Interestingly, one previous study of university students found a significant relationship between stimulant use and sexual addiction scores and another found particularly high rates of cocaine abuse among a group of sexually addicted individuals when compared to a non-sexual addicted group (Perera et al., 2009; Stavro et al., 2013). It is also possible that the use of sex or cybersex is functioning to regulate the emotion and there is not a need for concurrent substance abuse. The current study was limited as it examined general alcohol and drug use and future research should consider assessing specifically for stimulant use within this population to better understand the relationship.

Consistency across measures. Notably, there was little variation across measures when comparing the criterion validity and examining the correlates. While differences were demonstrated when examining the Fisher's r to z transformation, each of the measures demonstrated correlations of similar strength in the same direction with each of the correlates for the current samples. This consistency across measures suggests that each of the measures of cybersexual behavior, are examining a similar overarching construct. While all measures demonstrated acceptable criterion validity, this study aimed to develop and validate the PCBS. The PCBS demonstrated strong criterion validity and compared to the other measures of cybersexual behavior, the PCBS specifically evidenced stronger correlations with all of the correlates when compared to the ISST and with several correlates when compared to other measures. This suggests that not only does the PCBS evidence strong criterion validity, but that the proposed hypersexual disorder diagnostic criteria are encompassing cybersexual addiction in a similar manner to the conceptualizations of previous researchers. Overall, this provided

criterion validity for the PCBS and demonstrated that there is value in further refinement of this measure.

Model of Predictors of Cybersexual Behavior

Hypothesis Three proposed no a priori relationships of predictive value between the proposed correlates and cybersexual behavior. Interestingly, when entered into simple regression analyses all of the constructs, except for alcohol and drug abuse, positively predicted cybersexual behavior. As discussed above, this is consistent with the previous literature and the differences with regard to substance abuse may reflect population differences and the strength of the relationship between stimulant use and sexual addiction (Perera et al., 2009; Stavro et al., 2013). This study sought to understand the strongest predictors, or combination of predictors, of cybersex addiction.

When entered into a forced entry multiple regression, only offline sexual compulsivity, compulsive Internet use, and depression remained significant in predicting cybersexual addiction. Notably, sexual compulsivity appeared to account for most of the predictive variance (63.8%). This result is consistent with previous literature which found significant relationships between the two constructs, particularly that individuals with offline sexual compulsivity are more likely to spend large amounts of time on online sexual material when compared to individuals who do not have offline sexual compulsivity concerns (Daneback et al., 2006; Wetterneck et al., 2012). Also consistent with the findings of this study, researchers found that general levels of problematic sexual behavior positively predicted Internet pornography addiction in a sample of 102 heterosexual females (Laier, Pekal, & Brand, 2014). With regard to measures chosen, the SCS has been previously used to assess for cybersexual behavior and does not specifically state that questions are focused on offline behaviors only. Thus, the similarity of

the two constructs may be accounting for the large amount of variance offline/overall sexual compulsivity accounts for. These results also suggest that continuing to distinguish at-risk users and compulsive users by whether they have struggled with offline sexual compulsivity, may not be appropriate. Whereas researchers have stated that low users spend one hour or less engaged in Internet sexual behavior per week, moderate users spend 2–10 hours per week, and heavy users spend more than 10 hours per week; this particular sample had a reported average of under 2 hours of cybersex per week, and yet found similar results with regard to the relationship between cybersexual addiction and offline sexual compulsivity (Cooper et al., 1999; Parsons et al., 2007). Additional research focused on assessing at-risk users specifically is needed to support the use of hours spent as part of the diagnostic criteria.

Interestingly, compulsive Internet use was one of the only predictors to remain significant in the multiple regression model. While it added little variance to the overall model, it remained significant, supporting Griffiths's 2001 theory that individuals with problematic cybersexual behavior may be acting out an offline addiction in an online setting. Previous literature has theorized that there are two different routes to which someone can develop problematic cybersexual behavior. Whereas, Young (1999) theorized that individuals present with problematic Internet use prior to developing problematic cybersexual behavior, Griffiths proposed an alternative route and stated that individuals may have problematic sexual behavior/addictive behaviors and the Internet subsequently becomes the medium in which they engage in this behavior (2001). Griffith's proposal is further supported by the Brand et al. (2011) study examining the role of sexual arousal, use of sexual internet sites, and time spent on the Internet in predicting cybersexual behavior. This study found that time spent on the Internet added little variance to the model and that overall rates of sexual arousal were more predictive of

problematic cybersexual behavior (Brand et al., 2011). As overall sexual compulsivity accounted for the most variance in the current study, it appears that individuals who are engaged in cybersexual addiction may first be struggling with offline sexual addiction and turning to the Internet as medium in which to act out their behavior.

In addition to the above two constructs, depression, as measured by the DASS-21, was the only other correlate to continue to positively predict cybersexual behavior in the multiple regression model. This supports the proposed role of depressive symptoms in causing or maintaining cybersexual addiction and provides support for the depressive-type of at-risk user of cybersexual behavior (Cooper et al., 1999; Kafka & Hennen, 2002). At-risk depressive-type users are theorized to develop depressive symptoms following excessive cybersex which then leads to said symptoms maintaining the addiction (Cooper et al., 1999). This study did not specifically separate out at-risk users or compulsives and this result was obtained for a general sample reporting relatively low engagement in cybersex suggesting that depression may play a role across the levels of cybersex users. Thus, future studies should look at this relationship in order to better understand how it differs across these groups and to better understand the at-risk depressive type of user specifically.

While the other constructs were found to positively predict cybersexual behavior when examined individually, when entered into the forced entry multiple regression shame, loneliness, anxiety, stress, and substance abuse each contributed a non-significant amount of the variance. This result remained even when sexual compulsivity was controlled for. While an analysis of multicollinearity did not suggest that the measures of offline sexual compulsivity and cybersexual addiction were collinear, the similarity of these two constructs may account for the large amount of variance offline sexual compulsivity accounted for and the nonsignificant results

of the other constructs. Notably, stress, as measured by the DASS-21, negatively predicted cybersexual behavior in the multiple regression model. This was the only correlate to significantly negatively predict cybersexual behavior when entered into the model. While previous literature has suggested that individuals will turn to cybersexual behavior to deal with difficult emotions (Cashwell et al., 2016; Reid et al., 2008), this is likely reflective of noise in the data. There still is a continued need for specific research examining the differences between at-risk stress-reactive and at-risk depressive types of cybersexual users (Cooper et al., 1999). As the literature regard at-risk users and sexual compulsives as different groups in which the sexual compulsive group consists of individuals with offline sexual compulsivity in addition to online problems (Cooper et al., 1999), additional empirical research is needed examining these two groups. Specifically, future research should examine the predictive variance of each of these correlates with regard to each group

Research Implications

There are a number of research implications related to the findings of this study, including implications for the diagnosis of cybersexual addiction, measurement of this cybersexual addiction, and the correlates and predictors of this behavior. First, the extraction of Factor Two, Urgency, during the factor analysis of the PCBS suggests the need for further examination of the role of impulsivity, specifically the construct of urgency, in cybersexual addiction. Previous researchers have designated this diagnosis both as an addiction (Goodman, 1998) and as an impulse control disorder (Barth & Kinder, 1987; Grant et al., 2005). The appearance of a construct of impulsivity demonstrates the need for ongoing empirical investigation into the conceptualization of this diagnosis. Second, the PCBS currently has psychometric weaknesses, but has demonstrated significant criterion validity and remains the

only measure to include all of the proposed hypersexual disorder diagnostic criteria and to specify the utilization of Internet addiction criteria in the development of the measure (Kafka, 2010; Tao et al., 2011). Thus, it is recommended that there be additional refinement of this measure both with regard to the item language and factor structure.

Although the measure developed specifically for this study presented with a number of psychometric issues, the results provide support and suggestions for the use and refinement of other measures of cybersexual addiction. First, all measures presented with consistent and acceptable internal reliability suggesting consistency of measurement across the items. Second, each measure demonstrated reasonable criterion validity suggesting that they would be appropriate for use in studies examining the correlates of said behavior. Ultimately, the ISST (Delmonico & Miller, 2003) presented with some psychometric concerns related to the factor structure that may be related to the use of a general university and national population sample rather than the use of a sample with sexual concerns. This suggests that this measure will benefit from additional validation in populations with low use of cybersexual material. In contrast, the CPUI-9 and IAT_{sex} both produced factor structures consistent with the previous literature (Brand et al., 2011; Grubbs et al., 2015; Laier, Pekal, & Brand, 2015; Snagowski & Brand, 2015; Snagowski, Laier, Duka, & Brand, 2016; Wéry, Burnay, Karila, & Billieux, 2016). While the CPUI-9 specifically assesses for pornography use its use in future studies is supported by this result. The IAT_{sex} is a more inclusive measure and while it excludes items that assess for use in response to stress and increased risk-taking, this study provides additional psychometric validation for this measure and supports its use in future research. In sum, this study provides support for the use of both the CPUI-9 and the IAT_{sex} in studies of cybersexual and online

pornography addiction and the continued need for measures that assess for all the diagnostic criteria.

As this study was inclusive of all types of cybersexual behavior and there is little research on the differences between social and isolated behaviors, future research is needed examining both social and isolated sexual behavior and the different predictors of such behaviors. Delmonico and Miller had originally assessed for social and isolated behavior in the development of the ISST to determine gender differences in this behavior as women were hypothesized to prefer social behaviors (2003). However, beyond the ISST none of the measures assess for these two behaviors separately, thus little is known about the differences. In addition, future research should account for or include assessment items examining type of cybersex the individual has engaged in due to the evolving nature of cybersex. Behaviors such as sharing sexualized photos may not fit within the construct of sexual addiction, particularly as the prevalence of sharing sexualized photos of one's self is not an uncommon practice among youth samples, with researchers finding 2-24% of youth populations engaging in this behavior (Ybarra & Mitchell, 2016). The exchange of sexualized material of the self via various apps and texting occurs in is often viewed as a safer alternative to other sexual behaviors and may be occurring in higher rates in youth populations than with older adults (Ybarra & Mitchell, 2016). Particularly notable is that the item that assessed for this type of behavior in the PCBS, Item 30: "I have posted sexual material of myself online," loaded significantly on Factor Four, Risk-taking, but demonstrated the lowest factor loading of the four items within the factor. Along with the previous study, this finding suggests that sharing sexualized material of the self may be perceived differently and therefore not consistently reflect increased risk-taking in certain population. To accurately assess for this and understand these differences, future research on

cybersex and particularly measure development will benefit from including questions regarding the type of behavior individuals are engaging in.

This study examined a limited number of correlates of cybersexual addiction including offline sexual compulsivity, shame, loneliness, substance abuse, depression, anxiety, and stress demonstrating the need for additional research examining these constructs across types of cybersex users. This study examined a general population that self-selected for this study. Thus, future research will benefit from comparing each of these correlates across high and low users and those designated as at-risk users and as compulsives (Cooper et al., 1999). For example, the significant predictive relationship between sexual compulsivity, as measured by the SCS, and rates of cybersexual addiction in a general population suggest the need for further examination of the hypothesized types of cybersexual users which have previously been separated by whether or not they evidence problematic offline sexual behaviors (Cooper et al., 1999). Additional examination of this relationship is hypothesized to empirically support Griffiths's (2001) theory that individuals with cybersexual addiction first struggle with offline sexual behaviors and addiction prior to moving their addiction to the online realm.

A number of studies have assessed for the role of mood and anxiety disorders in sexual addiction behaviors (Corley & Hook, 2012; Kafka & Hennen, 2002; Laconi et al., 2015) and this study supported the findings. Specifically, high levels depression and anxiety were found to be positively correlated with and to predict high rates of cybersexual behavior. The clinical implications of this are discussed below. Future studies should examine the role of these diagnoses/symptoms in the general population in addition to populations of identified individuals with cybersexual addiction. With regard to the current designations of the two types of at-risk users, depressive and stress-reactive, the positive relationships and predictive values of both

depression and stress provide support for this (Cooper et al., 1999). As stated above, additional empirical support is needed for these constructs and the two groups should be assessed separately to clarify the separate roles of anxiety and depression between the two types of at-risk users.

While loneliness did not remain significant in the multiple regression model, the positive predictive value of this construct points to the need for additional literature examining at the social aspect of cybersex as a motivator. As this study did not differentiate between isolated and social cybersex, it is difficult to determine the specific role of loneliness. Future research should examine the role of loneliness specifically in relation to these two behaviors separately. In addition, the measure of anxiety looked solely at general levels of anxiety and not at the construct of social anxiety. This result, combined with the loneliness result, suggests that individuals may be turning to cybersex for social connection and future researchers should consider the role of social anxiety in the development of this disorder. In sum, the proposed correlates of cybersexual behavior largely supported previous literature and suggest the need for further empirical research demonstrating their role in the development and maintenance of cybersexual addiction.

Clinical Implications

There are several clinical implications of this study, particularly regarding the use of the proposed diagnostic criteria, the associated constructs, and treatment directions. The results imply that not only is further refinement of the PCBS needed, but that the proposed hypersexual disorder diagnostic criteria may need additional examination with regard to the construct being based in addiction or impulse control (Kafka, 2010). First, while items included in the final measure reflected the diagnostic criteria, the factors reflected a separation of logistical or practical consequences, emotional consequences, increased risk taking, and the construct of

urgency. Therefore, in addition to the use of diagnostic criteria, clinicians may benefit from assessing for these specific issues in relation to cybersexual behavior. Second, as the PCBS was positively correlated with each of the other measures of cybersexual addiction, it implies that while the other measures did not report specific diagnostic criteria, the currently available measures of cybersexual addiction may be appropriate for screening use in clinical settings.

Examination of the correlates and their predictive value with regard to cybersexual addiction provide additional information for clinicians treating this concern. The correlates examined in this study, namely shame, loneliness, depression, anxiety, stress, and compulsive Internet use all demonstrated positive relationships with cybersexual addiction behavior and positively predicted this behavior when entered into simple regressions. While several of them did not contribute significant variance to the model when included with overall sexual compulsivity and compulsive Internet use, these findings suggest that clinicians should assess for these constructs in addition to assessing for cybersexual behavior and consequences as way to understand the function of the behavior. With regard to treatment, clinicians may find positive outcomes when addressing these constructs in addition to the behavioral components of cybersexual addiction. For example, if an individual were to experience a reduction in loneliness he or she may be better able to have his or her sexual and social needs met offline, thus reducing the likelihood of engaging in problematic amounts of cybersex. Further, if future research continues to demonstrate the use of cybersexual behavior to regulate emotions per a 2016 study by Cashwell, Giordano, King, Lankford, and Henson, addressing emotion dysregulation may lead to a reduction of this behavior.

The above study specifically examined university students and compared student who scored within the clinical range of sexual addiction and found they reported significantly more

difficulties with emotion regulation than those who scored in the non-clinical range (Cashwell et al., 2016). While this was not a construct assessed in our study, the finding that stress, anxiety, and depression all positively predict cybersexual behavior supports the focus on overall emotional concerns in treating cybersexual addiction. Further, the relationship in the factor structure of the PCBS between emotional consequences and attempts to stop suggests the importance of the emotional consequences in motivation for change. This suggests that when working with individuals with these types of problematic behaviors, an emotion-focused approach in addition to behavioral skills training around managing emotions, including empirically supported treatments such as dialectical behavior therapy, may produce more effective symptom reduction. In sum, while there is little literature on the treatment of cybersexual addiction, the results of this study suggest that future treatment and treatment studies will benefit from focusing on the function of the cybersexual behavior in treatment.

Limitations

This study has a number of limitations that affected the results and generalizability of the current study; however, these limitations suggest areas of future research on cybersexual addiction. These limitations included the choice of diagnostic criteria, the samples collected, not differentiating between high or low users of cybersexual material, and the removal of Item 2 from the PCBS. Each of these are discussed below with suggestions for future research.

First, the use of the proposed hypersexual disorder diagnostic criteria present a limitation for this study (Kakfa, 2010). This set of criteria was written to encompass all varieties of sexual addiction, including cybersex, but it is not consistently utilized across the literature or identified in measure development studies (Brand et al., 2011; Delmonico & Miller, 2003; Grubbs et al., 2015). While these criteria were chosen as they were proposed for further study and inclusion in

the DSM-5 (Kafka, 2010), there is little empirical literature supporting this, or any, set of diagnostic criteria for sexual addiction (Cooper et al., 2004). This limits the current study with regard to comparing all of the measures of cybersexual addiction because none of the chosen measures specified which diagnostic criteria, if any, the measures were based upon (Brand et al., 2011; Delmonico & Miller, 2003; Grubbs et al., 2015). Future research should include measures developed utilizing the available sets of diagnostic criteria including Carnes' 1991 sexual addiction criteria, Goodman's 1998 expansion upon the 1991 criteria, and Kafka's 2010 criteria and comparing the measures for criterion validity. The utilization of each of these criteria sets in future research will provide empirical support for the criteria and support for inclusion in the DSM.

Second, the samples collected for this research also posed certain limitations. While some of the measure validation literature has been conducted on university students (Grubbs et al., 2015), other measures have looked specifically at individuals recruited from sexual help websites (Delmonico & Miller, 2003). The limitation of this sample, including both the university and the online sample, was that both were self-selecting for a research study focused on Internet sexual behavior. Further, all three samples had a reported average of time spent on online sexual behavior under two hours per week suggesting that they were not engaging in high rates of cybersexual behavior. Researchers have suggested that low users spend one hour or less engaged in Internet sexual behavior per week, moderate users spend 2–10 hours per week, and heavy users spend more than 10 hours per week (Cooper et al., 1999; Parsons et al., 2007); thus, this sample mostly reflected low users and not individuals engaged in what would be considered addictive cybersex based upon hours spent. The low use of cybersexual materials possibly affected the extracted factor structure of the PCBS. A sample of individuals who are reporting

significantly higher use may produce a different factor structure due to the higher rates of problematic use and one way for future research to account for this limitation, is to examine low users, moderate users, and high users separately and compare each group on levels of addictive behavior and correlates.

Third, and similar to above, this study looked at the general population without differentiating between high users or low users of Internet sexual material. As the literature differentiates between at-risk users, who solely engage in problematic sexual behavior online, and compulsives, who engage in sexual addiction behavior both offline and online, future research examining the correlates of this behavior should differentiate between these two groups to better understand what predicts the behavior for each group (Cooper et al., 1999). Specifically considering the at-risk group, two separate types, the depressive and the stress-reactive, have been identified meaning that the predictive variance of the DASS-21 subscales of depression and stress is likely to differ across the types of individual cybersex addiction (Cooper et al., 1999).

Fourth, the removal of item two of the PCBS is a limitation of the development and validation of the measure. As stated in the results section of this paper, no damage was done to the four-factor model of the PCBS by the removal of this item. However, since it did load significantly on Factor Two and specifically assesses for the escalation of the taboo nature of the material sought in order to orgasm, this item should be included in future studies that seek to further refine this measure. In sum, the study presents with a number of limitations that should be addressed in both future refinement of the PCBS and across the future cybersex addiction literature.

Conclusion

Thus far, few studies and no studies developing measures have specifically identified which diagnostic criteria have been used to conceptualize sexual addiction or cybersexual addiction. This study was the first to specifically develop a measure based on the proposed hypersexual disorder diagnostic criteria (Kafka, 2010). While the criteria were not accepted for inclusion in the DSM-5, this study sought to assess the validity of these criteria by developing a measure for cybersexual addiction based on said criteria. Unfortunately, the measure failed to produce a satisfactory factor structure and model fit; however, the resulting measure reflected the criteria and supported the addiction model of cybersex addiction. Further, the ISST produced a model that was unexpectedly different than the reported factor structures, whereas the CPUI-9, IAT_{sex}, and the SCS produced the factor structures consistent with previous research. This suggests that across the literature, further examination of the use of these measures and the proposed factor structure is needed.

The assessed correlates of cybersexual addiction, apart from substance abuse, demonstrated significant positive correlations with cybersexual addiction consistent with previous literature. As substance abuse was reported to be negatively associated with cybersexual behavior, additional research is needed examining specifically stimulant use and its role in both offline and online sexual addiction behaviors. Interestingly, the multiple regression model produced overall sexual compulsivity, compulsive Internet use, and depression as significant predictors of cybersexual addiction. Future research should assess these constructs and the other correlates further for both the at-risk and compulsive groups of individuals with problematic cybersexual behavior. It is possible that the correlates may produce a different

model between in each group. Based on the results of this study, the CPUI-9 and IAT_{sex} are the recommended measures for use for both clinical and research settings.

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Appendices

Appendix A: EMU Research Flier**EASTERN MICHIGAN UNIVERSITY****AN INVESTIGATION OF ONLINE SEXUAL BEHAVIOR**

WHAT: A research study examining online sexual behavior and emotional experiences.

WHO: University students, ages 18 and older.

FORMAT: The study consists of several online surveys that will take around 60 to 75 minutes to complete. The surveys will consist of questions inquiring about offline and online sexual behavior and emotional experiences. Your confidentiality while participating in this research study is very important. If you wish to receive extra credit at the discretion of your psychology professor, be sure you have accessed the study via the SONA website. The study is found on the SONA website for Eastern Michigan University. If you would like a direct link, the study is also found on an online survey site called SurveyMonkey. Just enter the following addresses into your internet browser (SurveyMonkey address provided on the back of tear-offs).

<http://emich.sona-systems.com/>; or <https://www.surveymonkey.com/>

RISKS: There are no foreseeable risks although some may experience mild psychological discomfort with a few of the items on the measures. Several of the measures will ask explicit questions about your online and offline sexual behavior. Should you wish to stop participating, or withdraw from participating, you may do so at any time without penalty. If you feel a need to talk to someone about how you feel, please call Counseling and Psychological Services at 734-487-1118.

BENEFIT: You are unlikely to get any direct benefit from taking part in the study. However, the knowledge that we obtain from your participation will help us understand the symptoms of online sexual behavior.

Student participants will be awarded credits on the Eastern Michigan University SONA system, which may be applied to any applicable classes.

CONTACT: If you would like additional information on the study, please contact Dr. Natalie Dove at ndove@emich.edu or Monica Lackups at mlackups@emich.edu.

This study was approved by the Eastern Michigan University Human Subjects Review Committee for the following date:

Appendix B: Mechanical Turk Announcement**AN INVESTIGATION OF ONLINE SEXUAL BEHAVIOR**

WHAT: A research study examining online sexual behavior and emotional experiences.

WHO: Individuals ages 18 and older.

FORMAT: The study consists of several online surveys that will take around 60 to 75 minutes to complete. The surveys will consist of questions inquiring about offline and online sexual behavior and emotional experiences. Your confidentiality while participating in this research study is very important. The link to the study is surveyMonkey.com/

RISKS: There are no foreseeable risks although some may experience mild psychological discomfort with a few of the items on the measures. Several of the measures will ask explicit questions about your online and offline sexual behavior. Should you wish to stop participating, or withdraw from participating, you may do so at any time without penalty.

BENEFIT: You are unlikely to get any direct benefit from taking part in the study. However, the knowledge that we obtain from your participation will help us understand the symptoms of online sexual behavior.

CONTACT: If you would like additional information on the study, please contact Dr. Natalie Dove at ndove@emich.edu or Monica Lackups at mlackups@emich.edu.

This study was approved by the Eastern Michigan University Human Subjects Review Committee for the following date:

Appendix C: EMU Consent Form

Dear Participant:

You are invited to participate in a research study that is investigating problematic online sexual behavior and emotional experiences. The purpose of this project is to better understand the relationships between emotional experiences and measures of problematic online sexual behavior. The results of this study will help researchers better understand the risk factors for problematic online sexual behavior.

Your participation will involve completing nine surveys with questions about offline and online sexual behavior and emotional experiences. You will be asked for explicit information about your online sexual behavior. Each survey is expected to take between 5-10 minutes to complete. In addition, your participation will involve completing a short demographic survey that asks questions about your age, gender, religious beliefs, and ethnicity. In total, your participation will take approximately 60 to 75 minutes.

Participation in this study is voluntary. There are no foreseeable risks although some may experience psychological reactions to a few of the items on the measures. Should you wish to stop participating, or withdraw from participating, you may do so at any time without penalty. However, if you feel a need to talk to someone about how you feel, let us know and we will make arrangements for you to see a professional helper. If you need information about psychological support, contact the Eastern Michigan University Psychology Clinic, located at 611 West Cross Street, Telephone No.: 734-487-4987. Should you wish to speak to someone directly about the study, you may contact the principal investigator, Monica Lackups, at mlackups@emich.edu, or Dr. Natalie Dove, at ndove@emich.edu.

You may be eligible to receive participation/extra credit for your psychology class in exchange for your participation. If you would like to be considered for extra credit in exchange for your participation, please be sure you have accessed the study through the EMU SONA System. You are unlikely to get any direct benefit from taking part in the study. However, the knowledge that we obtain from your participation will help us understand the problematic online sexual behavior. The results of the study, which will be de-identified so that no identifying information is provided, will be presented in relevant psychology journals and conferences. If you are interested in the results of the study, let us know, and we will send you a copy.

Your confidentiality while participating in this research study is very important. Rest assured that there will not be any way for someone to know what answers you gave.

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee for use from _____ to _____ (date). If you have questions about the approval process, please contact Dr. Sonia Chalwa at schawlaw@emich.edu.

Click here to indicate that you are 18 or older, understand the terms of this research, and agree to participate in the study.

Appendix D: MTurk Consent Form

Dear Participant:

You are invited to participate in a research study that is investigating problematic online sexual behavior and emotional experiences. The purpose of this project is to better understand the relationships between emotional experiences and measures of problematic online sexual behavior. The results of this study will help researchers better understand the risk factors for problematic online sexual behavior.

Your participation will involve completing nine surveys with questions about offline and online sexual behavior and emotional experiences. You will be asked for explicit information about your online sexual behavior. Each survey is expected to take between 5-10 minutes to complete. In addition, your participation will involve completing a short demographic survey that asks questions about your age, gender, religious beliefs, and ethnicity. In total, your participation will take approximately 60 to 75 minutes.

Participation in this study is voluntary. There are no foreseeable risks although some may experience psychological reactions to a few of the items on the measures. Should you wish to stop participating, or withdraw from participating, you may do so at any time without penalty. However, if you feel a need to talk to someone about how you feel, let us know and we will provide information for you to see a professional helper. Should you wish to speak to someone directly about the study, you may contact the principal investigator, Monica Lackups, at mlackups@emich.edu, or Dr. Natalie Dove, at ndove@emich.edu.

You are unlikely to get any direct benefit from taking part in the study. However, the knowledge that we obtain from your participation will help us understand the problematic online sexual behavior. The results of the study, which will be de-identified so that no identifying

information is provided, will be presented in relevant psychology journals and conferences. If you are interested in the results of the study, let us know, and we will send you a copy.

Your confidentiality while participating in this research study is very important. Rest assured that there will not be any way for someone to know what answers you gave.

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee for use from _____ to _____ (date). If you have questions about the approval process, please contact Dr. Sonia Chalwa at schawlaw@emich.edu.

_____ [Click here](#) to indicate that you are 18 or older, understand the terms of this research, and agree to participate in the study.

Appendix E: IRB Approval Form**RESEARCH @ EMU****UHSRC Determination: EXEMPT****DATE: January 16, 2016****TO: Monica Lackups, M.S.****Department of Psychology****Eastern Michigan University****Re: UHSRC: #841180-1****Category: Exempt category 2****Approval Date: January 16, 2016****Title: Development and Validation of a Measure of Cybersexual Addiction**

Your research project, entitled **Development and Validation of a Measure of Cybersexual Addiction**,

has been determined **Exempt** in accordance with federal regulation 45 CFR 46.102. UHSRC policy

states that you, as the Principal Investigator, are responsible for protecting the rights and welfare of your

research subjects and conducting your research as described in your protocol.

Renewals: Exempt protocols do not need to be renewed. When the project is completed, please submit

the **Human Subjects Study Completion Form** (access through IRBNet on the UHSRC website).

Modifications: You may make minor changes (e.g., study staff changes, sample size changes, contact

information changes, etc.) without submitting for review. However, if you plan to make changes that

alter study design or any study instruments, you must submit a **Human Subjects Approval Request**

Form and obtain approval prior to implementation. The form is available through IRBNet on the UHSRC

website.

Problems: All major deviations from the reviewed protocol, unanticipated problems, adverse events,

subject complaints, or other problems that may increase the risk to human subjects **or** change the category of review must be reported to the UHSRC via an **Event Report** form, available through IRBNet

on the UHSRC website

Follow-up: If your Exempt project is not completed and closed after **three years**, the UHSRC office will

contact you regarding the status of the project.

Please use the UHSRC number listed above on any forms submitted that relate to this project, or on any

correspondence with the UHSRC office.

Good luck in your research. If we can be of further assistance, please contact us at 734-487-3090 or via

e-mail at human.subjects@emich.edu. Thank you for your cooperation.

Sincerely,

Alissa Huth-Bocks, Ph.D.

Chair

CAS Human Subjects Review Committee

Appendix F: Demographic Questionnaire

What is your age?

What is your gender?

Male

Female

Transgender FTM

Transgender MTF

Other

Please specify your ethnicity. Some people identify as more than one ethnicity, please check all boxes that apply.

White

Hispanic or Latino

Black or African American

Native American or American Indian

Asian

Pacific Islander

Middle Eastern

Other

What is your sexual orientation?

Heterosexual

Homosexual

Bisexual

Queer

Other

Please identify your religious preference. If you do not consider yourself religious or are not practicing, please check not applicable.

Christian (Catholic, Protestant, Mormon, etc.)

Jewish

Muslim

Buddhist

Hindu

Spiritual

N/A

How many years of education have you completed?

What is your relationship status?

Single

In a relationship

Married

Divorced

Remarried

Living with partner

Other; Please specify

Please estimate how many hours per week you spend engaged in online sexual behavior.

0-1

2-10

10+

Appendix G: Proposed Problematic Cybersexual Behavior Scale

Directions: Please rate the following items according to the scale. Cybersexual behavior includes viewing pornography online, engaging in sexual chat room behavior, viewing individuals on live camera or putting one's self on live camera performing sexual acts for money (camming), and arranging to meet people offline for sexual behavior.

0- Disagree completely

1- Somewhat disagree

2- Neither agree nor disagree

3- Somewhat agree

4- Agree completely

1. I sometimes fail to meet my commitments or responsibilities because of my online sexual behavior.
2. I have had to start looking for more intense or hardcore material in order to orgasm.
3. I have declined invitations to be with friends or attend social functions in order to spend more time online in pursuit of sexual material.
4. Online sexual behavior has affected my romantic relationships
5. When I am stressed, I often engage in online sexual behavior.
6. I feel ashamed after engaging in online sexual behavior.
7. I am spending more money on online sexual material or behavior than I can afford.
8. I find myself engaged in online sexual behavior even when I had tried to avoid it.

9. I have punished myself after using the Internet for pornography or other sexual activity (ex. Time out from computer, cancelling my Internet subscription, mentally berating myself).
10. I have paid money to gain access to online sexual material.
11. I find myself looking at online sexual material after I have had a difficult day.
12. I have procrastinated on my work or other responsibilities so that I could pursue online sexual material or behavior.
13. I have continued to use online sexual material even after a significant other asked me to stop.
14. If I do not have access to online sexual material, I feel anxious, upset, or angry.
15. I am engaging in riskier online sexual behavior than I was when I first started.
16. I am disgusted with myself and my online sexual behavior.
17. I have tried to stop using the Internet for online sexual material or behavior.
18. I struggle to control my sexual thoughts and behaviors.
19. I only look at online sexual material when I am in a good mood. {r}
20. Online sexual behavior has made it difficult for me to have a romantic relationship.
21. I have unsubscribed from sexually explicit websites to avoid using them.
22. I have missed a deadline at work or school because of my online sexual behavior.
23. I find myself searching for online sexual material while at work or school.
24. I have used online sexual materials as a way to cope with feeling bad.
25. Online sexual behavior has negatively affected my friendships.
26. I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable.

27. I feel sick after engaging in online sexual behavior.
28. Viewing online sexual material or engaging in online sexual behavior helps me to cope with stress.
29. I have continued to use online sexual material even though I know it is getting in the way of my life.
30. I have posted sexual material of myself online.
31. I worry about what my partner or roommate might say if they saw the amount of sexual material I pursue online.
32. I have stayed up past when I wanted to in order to access online sexual material.
33. I have tried to block specific sexually explicit websites in order to prevent myself from using them.
34. I have given out my real name online to someone for sexual purposes.
35. I have gone out of my way to access online sexual material (e.g. using a specific e-mail address, clearing browser history, having a secondary computer).
36. I find myself seeking out online sexual material when I am bored.
37. I have continued to use online sexual material even after someone expressed concern.
38. I have made promises to others to stop using the Internet for online sexual material or behavior.
39. I have waited until my roommate or significant other is not around to seek out sexual material online.
40. I find myself seeking out online sexual material when I feel sad.
41. I have signed up for an account on a sexually explicit website.
42. Online sexual behavior has interfered with my life.

43. I spend more time on the Internet engaged with sexual material than I would like to.
44. I have changed my schedule in order to be home alone to view online sexual material.
45. Online sexual behavior has caused me problems at work (e.g. lost a job, called off sick in order to be online).
46. I find myself seeking out online sexual material when I feel anxious.
47. I have increased the risks I take online to access sexual material (ex. Using my real name, giving out my phone number).
48. I find myself engaged in online sexual behavior after something stressful has happened in my life (ex. Failing a test, fight with partner, bad review at work).
49. I have little to no difficulty controlling my online sexual behavior. {r}
50. I have spent more money than planned on online sexual material or behavior.
51. I have searched for online sexual material from a public location (e.g. work, library, Internet café).
52. I find myself seeking out online sexual material when I am worried.

Appendix H: Internet Sex Screening Test

Directions: Read each statement carefully. If the statement is mostly TRUE, place a check mark on the blank next to the item number. If the statement is mostly false, skip the items and place nothing next to the item number.

1. I have some sexual sites bookmarked.
2. I spend more than 5 hours per week using my computer for sexual pursuits.
3. I have joined sexual sites to gain access to online sexual material.
4. I have purchased sexual products online.
5. I have searched for sexual material through an Internet search tool.
6. I have spent more money for online sexual material than I planned.
7. Internet sex has sometimes interfered with certain aspects of my life.
8. I have participated in sexually related chats.
9. I have a sexualized username or nickname that I use on the Internet.
10. I have masturbated while on the Internet.
11. I have accessed sexual sites from other computers besides my home.
12. No one knows I use my computer for sexual purposes.
13. I have tried to hide what it is on my computer or monitor so others cannot see it.
14. I have stayed up after midnight to access sexual material online.
15. I use the Internet to experiment with different aspects of sexuality (e.g., bondage, homosexuality, anal sex, etc.)
16. I have my own website which contains some sexual material.
17. I have made promises to myself to stop using the Internet for sexual purposes.

18. I sometimes use cybersex as a reward for accomplishing something. (e.g., finishing a project, stressful day, etc.)
19. When I am unable to access sexual information online, I feel anxious, angry, or disappointed.
20. I have increased the risks I take online (give out name and phone number, meet people offline, etc.)
21. I have punished myself when I use the Internet for sexual purposes (e.g., time-out from computer, cancel Internet subscription, etc.)
22. I have met face to face with someone I met online for romantic purposes.
23. I use sexual humor and innuendo with others while online.
24. I have run across illegal sexual material while on the Internet.
25. I believe I am an Internet sex addict.
26. I repeatedly attempt to stop certain sexual behaviors and fail.
27. I continue my sexual behavior despite it having caused me problems.
28. Before my sexual behavior, I want it, but afterwards I regret it.
29. I have lied often to conceal my sexual behavior.
30. I believe I am a sex addict.
31. I worry about people finding out about my sexual behavior.
32. I have made an effort to quit a certain type of sexual activity and have failed.
33. I hide some of my sexual behavior from others.
34. When I have sex, I feel depressed afterwards.

Appendix I: Cyber Pornography Use Inventory-9

Items are rated according to the following markers.

0- Not at all

1-

2-

3-

4-

5-

6-

7- Extremely

1. I believe I am addicted to Internet Pornography.
2. Even when I do not want to use pornography online, I feel drawn to it.
3. I feel unable to stop my use of online pornography.
4. At times, I try to arrange my schedule so that I will be able to be alone in order to view pornography.
5. I have refused to go out with friends or attend certain social function to have the opportunity to view pornography.
6. I have put off important priorities to view pornography.
7. I feel ashamed after viewing pornography online.
8. I feel depressed after viewing pornography online.
9. I feel sick after viewing pornography online.

Appendix J: Internet Addiction Test- Sex

Based upon the following five-point Likert-type scale, select the response that best represents the frequency of the behavior described in the following 20-item questionnaire.

0 = Not applicable

1 = rarely

2 = occasionally

3 = frequently

4 = often

5 = always

1. How often do you find that you stay on Internet sex sites longer than you intended?
2. How often do you neglect household chores to spend more time on Internet sex sites?
3. How often do you prefer the excitement of online sexual activity to intimacy with your partner?
4. How often do you form new relationship with fellow Internet sex site users?
5. How often do others in your life complain to you about the amount of time you spend on Internet sex sites?
6. How often do your grades or school work suffer because of the amount of time you spend on Internet sex sites?
7. How often do you check Internet sex sites before something else that you need to do?
8. How often does your job performance or productive suffer because of online sexual activity?
9. How often do you become defensive or secretive when anyone asks you what you do online?

10. How often do you block out disturbing thoughts about your life with soothing thoughts of online sexual activity?
11. How often do you find yourself anticipating when you will go on Internet sex sites again?
12. How often do you fear that life without online sexual activity would be boring, empty, and joyless?
13. How often do you snap, yell, or act annoyed if someone bothers you while you are on Internet sex sites?
14. How often do you lose sleep due to later night online sexual activity?
15. How often do you feel preoccupied with Internet sex sites when off-line, or fantasize about being on Internet sex sites?
16. How often do you find yourself saying “just a few more minutes” when on Internet sex sites?
17. How often do you try to cut down the amount of time you spend on Internet sex sites and fail?
18. How often do you try to hide how long you’ve been on Internet sex sites?
19. How often do you choose to spend more time on Internet sex sites over going out with others?
20. How often do you feel depression, moody, or nervous, when you are not on Internet sex sites, which goes away when you are back on Internet sex sites?

Appendix K: Sexual Compulsivity Scale

A number of statements that some people have used to describe themselves are given below.

Read each statement and then circle the number to show how well you believe the statement describes you.

1- Not at all like me; 2- Slightly like me; 3- Mainly like me; 4- Very much like me

1. My sexual appetite has gotten in the way of my relationships.
2. My sexual thoughts and behaviors are causing problems in my life.
3. My desires to have sex have disrupted my daily life.
4. I sometimes fail to meet my commitments and responsibilities because of my sexual behaviors.
5. I sometimes get so horny that I could lose control.
6. I find myself thinking about sex while at work.
7. I feel that my sexual thoughts and feels are stronger than I am.
8. I have to struggle to control my sexual thoughts and behavior.
9. I think about sex more than I would like to.
10. It has been difficult for me to find sex partners who desire having sex as much as I want to.

Appendix L: Shame Inventory

This is a list of situations and behaviors that may be related to the experience of shame for you.

Please write a number (between 0-4) beside each statement which indicates the intensity of your *shame* about that event. If the statement does not apply to you, write and “X” beside the statement.

X- Didn't happen/does not apply to me

1- No shame

2- Slight shame

3- Moderate shame

4- Considerable shame

5- Extreme shame

A time when I was...

1. Was laughed at in front of others

2. Was criticized in front of others

3. Cried in front of others

4. Make a scene in public

5. Lost something important

6. Had sex with someone when I didn't want to

7. Forced/coerced someone to have sex with me

8. Had an affair/was unfaithful/was sexually promiscuous

9. Was sexually harassed

10. Made a suicide attempt/threat or harmed myself on purpose

11. Didn't know the answer to a question that I felt I should know
12. Was caught saying negative things about others
13. Overate or ate unhealthy/high fat food
14. Missed an important appointment
15. Was praised for something I didn't do
16. Didn't live up to a really important standard of mine
17. Didn't live up to others' standards
18. Told a lie
19. Broke a promise
20. Committed a crime
21. Knew someone talked badly about me behind my back
22. Received a compliment
23. Found out someone I cared for didn't feel the same way
24. Was turned down for a date/request to spend time with someone
25. Could not afford something
26. Was slow to learn something
27. Hurt someone emotionally
28. Hurt someone physically
29. Hurt an animal
30. Was physically or sexually abused
31. Saw a picture of myself/saw myself in mirror
32. Was afraid to do something
33. Failed at work

34. Lost a friendship
35. Had fantasies of violence or death
36. Had sexual/kinky fantasies
37. Betrayed a friend
38. Was betrayed by someone I care about
39. Hated a family member
40. Had an abortion
41. Had a private aspect of myself exposed
42. Other, describe:
43. Not being in an intimate relationship
44. Not having children
45. Being gay/lesbian/bisexual
46. Feeling unattractive/ugly
47. Having a mental disorder
48. Being a certain race/ethnicity
49. Not having a good career
50. Being adopted

Appendix M: UCLA Loneliness Scale

Instructions: Indicate how often each of the statements below is descriptive of you.

O indicates "I often feel this way"

S indicates "I sometimes feel this way"

R indicates "I rarely feel this way"

N indicates "I never feel this way"

1. I am unhappy doing so many things alone
2. I have nobody to talk to
3. I cannot tolerate being so alone
4. I lack companionship
5. I feel as if nobody really understands me
6. I find myself waiting for people to call or write
7. There is no one I can turn to
8. I am no longer close to anyone
9. My interests and ideas are not shared by those around me
10. I feel left out
11. I feel completely alone
12. I am unable to reach out and communicate with those around me
13. My social relationships are superficial
14. I feel starved for company
15. No one really knows me well
16. I feel isolated from others
17. I am unhappy being so withdrawn

18. It is difficult for me to make friends
19. I feel shut out and excluded by others
20. People are around me but not with me

Appendix N: Composite Measure of Problem Behaviors

The following questions ask about your drug and alcohol use. For each item, please answer using the following scale.

1- Very like me

2-

3-

4-

5-

6- Very unlike me

1. It's like me to be excited by the opportunity of taking drugs (this includes cannabis).

1-----2-----3-----4-----5-----6

2. It's like me to sometimes actively seek out drugs for personal use (this includes cannabis).

1-----2-----3-----4-----5-----6

3. It's like me to say no to drugs (this includes cannabis)

1-----2-----3-----4-----5-----6

4. It's like me to sometimes feel that I need to take drugs (this includes cannabis).

1-----2-----3-----4-----5-----6

5. It's like me to generally have no interest in taking drugs (this includes cannabis).

1-----2-----3-----4-----5-----6

6. It's like me to sometimes think that I might have a drugs problem (this includes cannabis).

1-----2-----3-----4-----5-----6

7. It's like me to sometimes consume more than 6 drinks in one evening.

1-----2-----3-----4-----5-----6

8. It's like me to drink a lot more alcohol than I initially intended.

1-----2-----3-----4-----5-----6

9. It's like me to feel excitement and/or tension in anticipation of getting drunk.

1-----2-----3-----4-----5-----6

10. It's like me to go out with friends who are drinking, but opt to stay sober.

1-----2-----3-----4-----5-----6

11. It's like me to sometimes feel that I need an alcoholic drink.

1-----2-----3-----4-----5-----6

Appendix O: Depression Anxiety Stress Scales-21

Please read each statement and circle a number 0, 1, 2, or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me a considerable degree, or a good part of the time

3 Applied to me very much, or most of the time

1. I found it hard to wind down.
2. I was aware of dryness of my mouth.
3. I couldn't seem to experience any positive feeling at all.
4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (e.g., in the hands).
8. I felt that I was using a lot of nervous energy.
9. I was worried about situations in which I might panic and make a fool of myself.
10. I felt that I had nothing to look forward to.
11. I found myself getting agitated.
12. I found it difficult to relax.
13. I felt down-hearted and blue.

14. I was intolerant of anything that kept me from getting on with what I was doing.
15. I felt I was close to panic.
16. I was unable to become enthusiastic about anything.
17. I felt I wasn't worth much as a person.
18. I felt that I was rather touchy.
19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).
20. I felt scared without any good reason.
21. I felt that life was meaningless.

Appendix P: Compulsive Internet Use Scale

1. How often do you find it difficult to stop using the Internet when you are online?
2. How often do you continue to use the Internet despite your intention to stop?
3. How often do others (e.g. partner, children, parents, friends) say you should use the Internet less?
4. How often do you prefer to use the Internet instead of spending time with others (e.g. partner, children, parents, friends)?
5. How often are you short of sleep because of the Internet?
6. How often do you think about the Internet, even when not online?
7. How often do you look forward to your next Internet session?
8. How often do you think you should use the Internet less often?
9. How often have you unsuccessfully tried to spend less time on the Internet?
10. How often do you rush through your home(work) in order to go on the Internet?
11. How often do you neglect your daily obligations (work, school, or family life) because you prefer to go on the Internet?
12. How often do you go on the Internet when you are feeling down?
13. How often do you use the Internet to escape from your sorrows or get relief from negative feelings?
14. How often do you feel restless, frustrated, or irritated when you cannot use the Internet?

Appendix Q: Problematic Cybersexual Behavior Scale (Final)

Directions: Please rate the following items according to the scale. Cybersexual behavior includes viewing pornography online, engaging in sexual chat room behavior, viewing individuals on live camera or putting one's self on live camera performing sexual acts for money (camming), and arranging to meet people offline for sexual behavior.

5- Disagree completely

6- Somewhat disagree

7- Neither agree nor disagree

8- Somewhat agree

9- Agree completely

1. I sometimes fail to meet my commitments or responsibilities because of my online sexual behavior.
2. I have declined invitations to be with friends or attend social functions in order to spend more time online in pursuit of sexual material.
3. Online sexual behavior has affected my romantic relationships
4. When I am stressed, I often engage in online sexual behavior.
5. I feel ashamed after engaging in online sexual behavior.
6. I am spending more money on online sexual material or behavior than I can afford.
7. I have punished myself after using the Internet for pornography or other sexual activity (ex. Time out from computer, cancelling my Internet subscription, mentally berating myself).
8. I have paid money to gain access to online sexual material.

9. I find myself looking at online sexual material after I have had a difficult day.
10. I have procrastinated on my work or other responsibilities so that I could pursue online sexual material or behavior.
11. I have continued to use online sexual material even after a significant other asked me to stop.
12. If I do not have access to online sexual material, I feel anxious, upset, or angry.
13. I am engaging in riskier online sexual behavior than I was when I first started.
14. I am disgusted with myself and my online sexual behavior.
15. I have tried to stop using the Internet for online sexual material or behavior.
16. I struggle to control my sexual thoughts and behaviors.
17. Online sexual behavior has made it difficult for me to have a romantic relationship.
18. I have unsubscribed from sexually explicit websites to avoid using them.
19. I have missed a deadline at work or school because of my online sexual behavior.
20. I find myself searching for online sexual material while at work or school.
21. I have used online sexual materials as a way to cope with feeling bad.
22. Online sexual behavior has negatively affected my friendships.
23. I have met face to face with someone I met online for sexual purposes, even though I felt uncomfortable.
24. I feel sick after engaging in online sexual behavior.
25. Viewing online sexual material or engaging in online sexual behavior helps me to cope with stress.
26. I have continued to use online sexual material even though I know it is getting in the way of my life.

27. I have posted sexual material of myself online.
28. I worry about what my partner or roommate might say if they saw the amount of sexual material I pursue online.
29. I have stayed up past when I wanted to in order to access online sexual material.
30. I have given out my real name online to someone for sexual purposes.
31. I have gone out of my way to access online sexual material (e.g. using a specific e-mail address, clearing browser history, having a secondary computer).
32. I find myself seeking out online sexual material when I am bored.
33. I have continued to use online sexual material even after someone expressed concern.
34. I have made promises to others to stop using the Internet for online sexual material or behavior.
35. I have waited until my roommate or significant other is not around to seek out sexual material online.
36. I find myself seeking out online sexual material when I feel sad.
37. I spend more time on the Internet engaged with sexual material than I would like to.
38. I have changed my schedule in order to be home alone to view online sexual material.
39. I find myself seeking out online sexual material when I feel anxious.
40. I have increased the risks I take online to access sexual material (ex. using my real name, giving out my phone number).
41. I find myself engaged in online sexual behavior after something stressful has happened in my life (ex. Failing a test, fight with partner, bad review at work).
42. I find myself seeking out online sexual material when I am worried.