

THE PSYCHOMETRIC ASSESSMENT OF A COMPREHENSIVE PROBLEMATIC
PORNOGRAPHY USE INSTRUMENT

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DEDICATION

This dissertation is dedicated to my mother, Marlyn Marshall. As my teacher for the overwhelming majority of my primary school years, she was the first to give me all of the tools I needed to accomplish my academic goals. She fostered my creativity, helped me organize my thoughts, and most importantly of all, always provided an ear to let me “talk it out.” Though many people ran for the hills when little Ethan said “let me tell you something,” my mother was always there and happy to listen. To this day I still start my papers with the same outline format that she taught me in my elementary school years, this dissertation included. I will continue to strive to make her proud, and though I may still call her from time-to-time with questions about grammar, I know that I am able to do what I am doing today because of her. Love you, mom.

ABSTRACT

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Researchers have spent decades attempting to understand the potential negative effects of pornography use. While these potential negative effects range from risky sexual behavior to relationship problems, the main concern of the current study involves the relationship of pornography use with sexual coercion. This line of inquiry has yielded valuable evidence indicating there is a relationship between the use of pornography and sexual coercion, though this relationship is not well understood. One key issue preventing researchers from understanding when pornography use becomes problematic, involves the inconsistent operationalization of pornography use, stemming from the lack of a comprehensive, valid, and reliable pornography use instrument.

The goal of this dissertation is to fill this gap in the research through the development of such an instrument. A sample of 524 college age and general population males was used to develop the instrument, conduct reliability and validity analyses, and to examine if meaningful thresholds exist that could predict sexually coercive behavior. Additionally, two smaller sample were used to conduct a test-retest analysis, and to develop validity scales for the instrument. The analyses resulted in a 170-item instrument spanning previously identified domains of pornography use that demonstrated excellent reliability, as well as concurrent, convergent, and predictive validity. Additionally, thresholds for specific scales and the total score were identified.

Findings from this study provide useful information for the operationalization of pornography use moving forward, through identifying latent factors that comprise the

various aspects of pornography use identified in previous research. Additionally, the instrument developed in this study will not only serve as a tool for researchers hoping to better understand the relationship pornography use has with a host of sexual behaviors, but it can also serve to help professionals tasked with treating and supervising individuals who have sexually offended, as well as counselors tasked with treating individuals seeking help with compulsive pornography use. The results from the current study are an important first step in the development of the instrument. Future replication research using samples of individuals who have sexually offended, as well as replication among samples of women, is needed to further demonstrate its reliability and validity prior to widespread implementation.

KEY WORDS: Pornography use; Sexual coercion; Psychometrics; Instrument development; Assessment

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CHAPTER I

Introduction

The creation and use of pornography is no recent occurrence. Some of the earliest known human artistic expressions discovered on the walls of caves in France include explicit images of individuals engaging in sexual acts (Ley, 2016). The development and procurement of such materials has been consistent throughout history, even during moralistic periods, such as the Victorian era (Ley, 2016). It seems that ever since humans have been able to create depictions of human life and behavior, sexual activity has been included in these artistic expressions. If this is the case, why is there such a recent growth in research on pornography use? Why are there some individuals claiming that pornography should be considered a “public health crisis” (Nelson & Rothman, 2020)? In order to understand this growth in research and the increasing “moral panic” that accompanied it, it is necessary to look at how the scope of pornography use has drastically changed in recent years.

First, though the estimates vary widely, the pornography industry in the United States likely generates billions of dollars every year (Benes, 2018), with some estimates indicating that it draws more revenue than the National Football League, the National Basketball Association, and the popular online streaming service “Netflix” (Benes, 2018). Second, and as no surprise considering the amount of money it generates, research over the last few decades has demonstrated a consistent increase in the use of pornography (see, DeKeseredy & Corsionos, 2016). These studies have shown that the overwhelming majority of men have viewed pornography at some point in their life, and the majority of women have used pornography as well (Sabina et al., 2009; Wolak et al.,

2007). This drastic increase in pornography use is likely due to technological advancements over the last few decades. Specifically, the advent of the internet and the prevalence of smart phones. The introduction of the internet is arguably the single most powerful catalyst in the increase of pornography consumption (Byers et al., 2004). Often referred to as the “3A Engine,” the anonymity, affordability, and accessibility of internet pornography have contributed to the use of pornography through this medium (Cooper, 1998; Cooper et al., 2002). In other words, individuals no longer have to go out in public to adult bookstores to pay for pornographic material; now they can access millions of hours of a variety of material for free from their own homes. Additionally, the introduction of the smart phone bolsters the “accessibility” aspect of internet pornography. Individuals can access the seemingly endless library of pornographic material whenever and wherever they want. Unsurprisingly, recent statistics from the largest pornographic site (PornHub, 2019) indicate that smartphone traffic accounts for almost three quarters of the visits to their website.

Considering the growth of the pornography industry, the increase in consumption of pornographic materials, the increasing prevalence and availability of violent pornography (Bridges et al., 2010), and the prior evidence that there is a relationship between pornography use and sexual aggression (Allen, D’Alessio, et al., 1995; Allen, Emmers, et al., 1995), it should come as no surprise that there is now more interest in examining the potential effects of pornography use on human sexuality. In other words, there has been an increased interest in answering the following question: when does pornography use become problematic? Researchers attempting to answer this question have looked at the relationship between pornography use and many sexual behaviors or

attitudes, ranging from sexual satisfaction to sexual dysfunction, but the current study will focus on the relationship between pornography use and sexually coercive behaviors. Though the debate continues regarding whether the relationship is causal or not, there is ample evidence indicating that pornography use is related to committing acts of sexual coercion (Wright et al., 2016). A recent meta-analysis by Wright and colleagues (2016) demonstrated that this relationship has been identified in a variety of samples, including samples of men and women from the general population, college students, and offenders.

Though this meta-analysis provides a foundation for the confidence researchers have in the relationship between pornography and sexual coercion, some significant methodological issues in these studies have been identified. Of particular concern to these researchers is the operationalization of pornography use. First, Short and colleagues (2012) conducted a systematic review of the operationalization and conceptualization of pornography use across studies examining the relationship between pornography use and sexual aggression, and revealed that there was a lack of consistency in these methods. Finally, Short and colleagues (2012) noted the ubiquity of researcher-generated items. In other words, no valid or reliable measures were used to assess pornography consumption. While a more recent review conducted by Marshall and Miller (2019) provided additional evidence regarding the inconsistent operationalization of pornography use, they did find that previously developed pornography use assessments were used in a small portion of studies. The authors note, however, that these assessments lacked adequate demonstration of psychometric qualities, are limited in the aspects of pornography use that they assess, and are generally outdated in medium content.

The purpose of the current study is to work towards filling this gap in the research, by proposing a comprehensive pornography use instrument and conducting an initial psychometric assessment of the items developed to comprise this instrument. The need for a comprehensive pornography use instrument is evident, and the results of this study will give the first steps necessary for providing this instrument to researchers who are attempting to understand when pornography use becomes problematic, and for practitioners working with individuals who may engage in problematic pornography use.

CHAPTER II

Literature Review

Empirical Research on Pornography Use and Sexual Coercion

Research on the relationship between pornography use and sexual coercion has been conducted by a number of researchers over the last few decades. Initially, researchers used experimental studies to assess this relationship (Dekeseredy & Corsianos, 2016). While meta-analyses revealed considerable support for the influence of pornography use on sexual coercion (Allen, D'Alessio, et al., 1995; Allen, Emmers, et al., 1995), some scholars criticized the validity of these studies (see, Fisher & Grenier, 1994). Critics of this approach specifically called for naturalistic studies. In other words, researchers suggested that it may be more advantageous to assess the effect of pornography use for individuals who *choose* to use pornography (Fisher & Barak, 2001). Whether researchers purposefully sought to answer this call, the primary method for examining the relationship between pornography use and sexual coercion is through self-report surveys (Buzzell, 2005). This review will focus on the aspects of pornography consumption that have proved most useful when looking at its relationship with sexual coercion. These aspects are frequency, type, sexual scripts, number of modalities, compulsive use, and age at first exposure. The first to be discussed, and the most commonly assessed aspect, is frequency.

Frequency of Pornography Use

A number of studies provide ample evidence indicating that increased frequency of pornography use is associated with engaging in sexually coercive behaviors (Bonino et al., 2006; Bouffard, 2010; Brown & L'Engle, 2009; Burton et al., 2011; Carr &

VanDeusen, 2004; Chang et al., 2016; D'Abreu & Krahe, 2014; Kennair & Bendixen, 2012; Malamuth et al., 2000; Simons et al., 2012; Vega & Malamuth, 2007; Williams et al., 2009). Earlier survey studies on pornography use and sexual coercion focused more on the use of movies, books, and magazines, rather than the use of internet pornography. While these studies may be limited due to this fact, Wright and colleagues (2016) indicate that the significant relationship between pornography use and sexual coercion being found both before and after the advent of internet pornography contributes to confidence in the strength of this relationship.

In one of the earliest survey assessments of the relationship between pornography use and sexual aggression, Malamuth and colleagues (2000) gathered a sample of 2,972 college males across the United States, and assessed the relationship between the frequency of exposure to pornographic magazines (i.e., *Playboy*, *Penthouse*, etc.) and engagement in sexually coercive behaviors. Sexual coercion was assessed using a ten-item scale developed by Koss and Oros (1982), which assesses behaviors ranging from using a position of power, to using physical force to obtain sex. According to the authors, this scale assesses engagement in these behaviors during the previous school year, as well as since the respondent was at least 14 years of age. Results of the article indicated that increased frequency of viewing pornographic magazines was associated with higher scores on the measure of sexual coercion. This relationship remained significant after controlling for other relevant factors, such as previous self-reported delinquency, hostile masculinity, attitudes supporting violence, and sexual promiscuity.

Carr and VanDeusen (2004) contributed to this finding by including additional control variables in their sample of 99 college men. Beyond assessing use of

pornographic magazines, the authors also accounted for previous victimization, alcohol use, and emotional empathy (Carr & VanDeusen, 2004). The researchers also expanded the assessment of pornography use to include videos and books, accounting for an increased number of mediums compared to previous work (Malamuth et al., 2000). As for sexual aggression, the authors used the same assessment developed by Koss and Oros (1982). Results of Carr and VanDeusen's (2004) study mirrored earlier work; even when controlling for all relevant factors, there was a significant relationship between pornography use and sexually coercive behaviors. It should be noted that within the measure of pornography use, Carr and VanDeusen (2004) included attending strip clubs. This does introduce a confound into this measure, calling into question the reliability of the findings. Regardless, the findings support the assertion that increased frequency of pornography use is related to sexual coercion. Vega and Malamuth (2007) used a similar method in their examination of this relationship among college males, in that they used the same measure of sexually coercive behavior (SES-P, Koss & Oros, 1982). Their measure of pornography use, however, was slightly different from previous work. Vega and Malamuth (2007) only measured the frequency with which respondents viewed pornographic magazines, providing response options ranging from "never to every issue." Even with the varying measurement of pornography use, Vega and Malamuth (2007) found a significant relationship between frequency of pornography use and sexual coercion.

D'Abreu and Krahe (2014) expanded the generalizability of this finding beyond college males in the United States, with a sample of 120 college males from a university in Brazil. Like previous researchers, they used a version of the Sexual Experiences

Survey (SES-SFP; Koss et al., 2007). Pornography use was examined by asking the respondents how frequently they saw images of sexual intercourse, as well as images of other types of sexual acts (i.e., masturbation, oral sex) on television, the internet, a cell phone, books, or magazines. D'Abreu and Krahe (2014) combined these eight items into a scale, and this scale demonstrated good reliability ($\alpha = .86$). The results of their analysis showed that pornography use frequency was significantly related to engagement in acts of sexual coercion. Beyond extending this finding to an international sample, it should be noted that the study was conducted over two waves. This provided the researchers with the ability to establish some evidence of time order. While these studies provide ample evidence for the relationship between pornography use and sexual aggression among college males, researchers have also examined this relationship in samples that included college females. The studies largely mirror these findings.

One such study, conducted by Simmons and colleagues (2012), sought to examine the relationship between pornography use, corporal punishment, sexual coercion, and sexual victimization in college males and females. For the purpose of the current review, only the methods and results involving pornography use and sexual coercion will be discussed. Simmons and colleagues (2012) asked their sample of 2,062 college men and women two questions regarding their pornography use. Respondents were asked how often they had viewed an X-rated movie or X-rated material on the internet (Simmons et al., 2012), and were provided response options ranging from never to nearly every day. Contrary to previous studies, Simmons and colleagues (2012) used the Sexual Coercion Scale (Tyler et al., 1998). The results of the study indicated that pornography use was significantly related to increased engagement in sexually coercive acts in both men and

women. Furthermore, this relationship retained significance when controlling for relevant variables, such as victim perception (Simmons et al., 2012). Marshall and colleagues (2020) conducted a similar study using a sample of 745 college males and females. In their study, they assessed the frequency in which the participants viewed pornographic material on the internet, books, movies, and magazines. As for sexual coercion, rather than assessing self-reported acts of sexual aggression, the authors presented a hypothetical dating scenario to the respondents, and required them to respond with the likelihood ranging from 0 to 100% that they would engage in four types of sexually coercive behaviors. These behaviors were divided into verbal coercion (lying to obtain sex, pressuring the person) and illegal coercion (getting them drunk, using physical force). The results of their analysis indicated that, for men, increased pornography use frequency significantly increased the likelihood that they would engage in both verbal and illegal coercion. For the women, however, there was only a significant relationship with verbal coercion. While the authors posit that this might be a product of the extremely low likelihood of engaging in illegal coercion reported by women, this could also indicate that pornography use may have a different relationship with acts of sexual coercion among women (Marshall et al., 2020).

Research by Bonino and colleagues (2006) engaged in a similar line of inquiry, but did so with a sample of 804 adolescent boys and girls. In particular, Bonino and colleagues (2006) examined whether the frequency of consuming pornographic books, magazines, and movies was related to acts of sexual coercion, which was measured in this study through asking respondents two items assessing how frequently they had sexually harassed a peer, or physically forced someone to have sex. Likert response

options were provided for each item, with response options ranging from never to always. Results of their analyses mirrored previous work; there was a significant relationship between frequency of pornography consumption and sexually coercive behaviors (Bonino et al., 2006). Contrary to previous research, this relationship was stronger for the adolescent girls in the sample, when compared to the boys (Bonino et al., 2006). The researchers state that the girls in their sample may be more sensitive to pornography than boys during adolescence.

Brown and L'Engle (2009) expanded this body of research among adolescent boys by including internet pornography in their assessment of pornography use. Furthermore, this study was conducted using a longitudinal design, allowing the researchers to examine whether time order was present in the relationship. Using a sample of 967 adolescent boys and girls, Brown and L'Engle (2009) asked the respondents how frequently they had viewed X-rated films, magazines like *Playboy*, *Playgirl*, *Penthouse*, or *Hustler*, and pictures of naked men or women on their computer. Sexual coercion was measured through asking the respondents the number of times they had engaged in seven specific activities. While the activities contained within the scale did not assess obtaining sex through physical force, the questions addressed various forms of unwanted sexual touching and verbal harassment (Brown & L'Engle, 2009). The results of their analysis showed that increased exposure to sexually explicit media in early adolescence (12 to 14 years of age) was significantly related to more frequent engagement in sexually coercive acts. Furthermore, the authors note that sexually explicit media was one of the strongest predictors in their model, after controlling for demographic, attitudinal, and personality variables (i.e., sensation seeking). The only

distinct finding between the boys and girls in the sample, was that girls who viewed sexually explicit media more frequently demonstrated less progressive gender roles (Brown & L'Engle, 2009). No significant differences were found in the relationship between pornography use and sexually coercive behaviors.

In a similar study, Kennair and Bendixen (2013) examined the relationship between pornography use and sexual coercion in a sample of 1199 adolescents from Central Norway. Participants were asked the frequency with which they had viewed pornographic, erotic, or X-rated magazines or movies, with responses ranging from never to every day. Contrary to Brown and L'Engle (2009), Kennair and Bendixen (2013) gathered items assessing use of force to obtain sex, as well as items assessing varying levels of sexual harassment. The results of their analyses indicated that increased frequency of pornography consumption was significantly related to engaging in acts of sexual coercion (Kennair & Bendixen, 2013). Unfortunately, the authors were unable to examine differences between the boys and girls in their sample, due to the extremely low rate of self-reported acts of sexual coercion among girls. Though the study lacks the ability to establish time order in the relationship, the results extend the finding beyond the United States and into a sample of European adolescents, which according to the authors, represents a more highly egalitarian culture (Kennair & Bendixen, 2013).

While these studies provide insight into the relationship between frequency of pornography use and sexual coercion, frequency is not the only variable of interest that researchers have examined. One of the most commonly assessed variables of pornography use outside of frequency, is the type of pornography an individual views (Marshall & Miller, 2019). In fact, a number of studies indicate that frequency of

pornography use may be a weaker predictor of sexually coercive behaviors when compared to the type of pornography an individual views (Kingston et al., 2008; Seto et al., 2010). The review will now turn to this body of research.

Type of Pornography Used

Researchers interested in the relationship between type of pornography used and sexual aggression have focused on one specific type of pornography: violent pornography. As this line of research began to emerge over the last several decades, early experimental studies in this area typically focused on exposure to violent pornography, non-violent pornography, and non-pornographic media (Allen, D'Alessio, et al. 1995; Allen, Emmers, et al., 1995). Authors of these studies consistently found the strongest effects on likelihood of sexual coercion, as well as well-known correlates of sexual aggression, among exposure to violent pornography, though many of the studies found significant effects for non-violent pornography as well. In contrast, the meta-analysis conducted by Wright and colleagues (2016) failed to find a significantly stronger effect between use of violent pornography and sexual coercion, when compared to use of non-violent pornography. Researchers have also examined whether frequency or type more strongly predict sexually coercive behaviors. This review will discuss the most notable studies assessing the relationship violent pornography and sexually coercive behaviors.

One of the earliest studies examining this relationship, was a study conducted by Demare and colleagues (1993). A sample of 383 college males was collected and surveyed about their pornography use, self-reported sexual coercion, and self-reported likelihood of sexual coercion in response to a hypothetical scenario. Both frequency of pornography use and type were assessed. Specifically, respondents were asked the

frequency with which they viewed specific types of pornography, with response options ranging from never to daily. The authors measured violent pornography through asking respondents the frequency with which they viewed pornography depicting men forcing women to engage in sexual acts against their will, or depictions of rape (Demare et al., 1993). Non-violent pornography was assessed by asking respondents the frequency with which they viewed pornography containing mutually consensual sex. Results of their bivariate analysis indicated that violent pornography use was significantly correlated with both likelihood of committing sexually coercive acts, and a higher likelihood of reporting actually engaging in such behaviors (Demare et al., 1993). Non-violent pornography was significantly related to both likelihood and actual sexual coercion as well, yet this relationship was weaker than with violent pornography. The results of the multivariate model showed that use of violent pornography remained significantly related to both likelihood of engaging in sexually coercive behaviors, as well as self-reported previous engagement, after controlling for rape myth acceptance, acceptance of interpersonal violence, and negative attitudes towards women (Demare et al., 1993). For non-violent pornography, however, this relationship was no longer significant. The authors posit that the relationship between pornography use and sexual coercion may be driven by the content of the material.

A more recent study conducted by Gonsalves and colleagues (2015) yielded results conflicting Demare and colleagues' (1993) study. Gonsalves and colleagues (2015) surveyed 283 college males on their pornography use habits, as well as their self-reported engagement in sexually coercive behaviors. Sexually coercive behaviors were assessed through the use of the Sexual Experiences Questionnaire (SEQ; Lisak & Roth,

1988), which according to the authors, is a modified version of the Sexual Experiences Survey (SES; Koss & Oros, 1982) with a focus on use of manipulation and force tactics to obtain sex. Contrary to Demare and colleagues (1993), type of pornography was not built into frequency-Likert-type questions; a series of 17 true-false questions assessing specific behaviors were provided to respondents. These questions ranged from pornography containing consensual penetration, to degradation and forced sex. In order to create a category for “violent” pornography, any individual that answered “yes” to viewing degrading or forced sex pornography, was considered a “violent pornography user.” While the results of their study did indicate that individuals who endorsed more types of pornography were more likely to engage in sexual coercion, users of “violent” pornography were not significantly more likely to have engaged in acts of sexual aggression.

While these studies have concerned college males, there have been a number of studies looking at this relationship among other populations. Seto and colleagues (2010) examined if violent pornography and frequency of pornography use contributed to sexual coercion in a sample of Norwegian male adolescents. Violent pornography was assessed through asking respondents whether they viewed pornography containing depictions of sex with violence or force (Seto et al., 2010). The results of their analyses indicated that use of violent pornography was related to increased odds of engaging in acts of sexual coercion. Additionally, their results showed that type of pornography used was a stronger predictor of sexual coercion than frequency. The authors also reported that, after adjusting odds ratios for all of the other variables included in the model, violent

pornography remained significantly related to the odds of engaging in sexual coercion, while frequency was no longer a significant predictor.

Ybarra and colleagues (2011) conducted a similar study using a sample of male and female adolescents from the United States. Use of violent pornography was assessed through asking respondents whether they viewed movies or magazines in which individuals were harmed or physically hurt during a sexual act, and sexual coercion was assessed through asking respondents the number of times they had ever kissed, touched, or done something sexual to someone without their permission. Additionally, the authors used a longitudinal design for the study, and collected three waves of data over a 36-month period. The results of their study showed that, compared with individuals who viewed non-violent pornography, viewers of violent pornography were six times more likely to report sexually coercive behaviors during the 36-month follow-up period. Furthermore, when dividing the sample into male and female, the relationship between violent pornography and sexual coercion over the three waves of data collection remained significant. This contributes further evidence to the importance of considering the content of the pornography one views, rather than just the frequency.

Finally, Kingston and colleagues (2008) examined this relationship in a sample of 341 individuals who were arrested and convicted for committing sexual offenses against a child (e.g., anyone under the age of 16). Beyond assessing the frequency of pornography use, the authors also assessed the use of deviant pornography, which involved pornography containing violence or children. Rather than measuring self-reported acts of sexual coercion, the authors examined both violent and sexual recidivism. The results of the study indicated that, even after controlling for empirically

supported risk variables contained on the Static-99 (Hanson & Thornton, 2000), use of violent pornography was significantly predictive of both violent and sexual recidivism. In contrast, frequency of pornography use was only significantly predictive for those individuals who were already at a high risk of sexually recidivating (e.g., individuals identified as high-risk, according to the Static-99). This contributes further evidence that the type of pornography used by an individual plays an important role in the relationship between pornography and sexual coercion.

Sexual Scripts

An area that has garnered a large amount of attention from researchers is the use of theory to explain the relationship between pornography use and sexually coercive behaviors. The most notable theory developed and tested for this purpose is the Confluence Model (Malamuth et al., 2000). This theory states that pornography use interacts with hostile masculinity and sexual promiscuity to influence sexually coercive behaviors. Researchers have revealed some support for the theory (Malamuth et al., 2000; Malamuth et al., 2012; Vega & Malamuth, 2007), but more recent research has revealed that there is a lack of causal evidence for the Confluence Model (Baer et al., 2015). In particular, these researchers provide evidence that many individuals already have high levels of hostile masculinity and sexual promiscuity. This calls into question the time order necessary to establish causation between pornography use and sexual coercion. A more recent line of research has found significant support for an alternative theory as an explanation for the relationship between pornography use and sexual aggression: The Sexual Script Theory (Gagnon & Simon, 1973).

When Gagnon and Simon first introduced the sexual script theory in their seminal 1973 work, *Sexual Conduct*, the presiding view on sexuality was a biological model. To Gagnon and Simon, biological explanations for sexual behavior were incomplete and they argued that sexuality was actually a social product (Beres, 2014). Drawing on their influence from figures of the Chicago School, such as Howard Becker, G. H. Mead, and Erving Goffman, Gagnon and Simon began to develop their own theory of sexual behavior that incorporated social constructionism into the development of sexuality (Jackson et al., 2010). The term social constructionism was first used by Berger and Luckman (1966) in their influential sociological work *The Social Construction of Reality*. While sexuality was not the focus of their work, the plasticity of sexual behaviors across history and culture was used to demonstrate that human behavior is a construct of humans (Jackson et al., 2010). The application of social constructionism to sexuality was illustrated by Gagnon and Simon using the metaphor of “scripts” (Gagnon & Simon, 1973).

Inspired by the distinction between sexual conduct and sexual behavior made by Ernest W. Burgess, Gagnon and Simon use scripts to explain the difference between sexual behavior and sexual conduct. According to Gagnon and Simon, conduct is not observed behavior, but rather “conduct is behavior as prescribed or evaluated by the group” (1973, p. 153). These prescriptions and evaluations are what Gagnon and Simon call scripts. In other words, scripts are mechanisms through which society defines and disseminates what is acceptable, desirable, and pleasurable sexual conduct. Scripts can range from ideas about how situations become sexual, how sexual encounters progress (e.g., kissing, foreplay, and finally resulting in intercourse), to what kind of sexual

behaviors one must engage in to provide or receive pleasure. Elaborating further on this concept, revisions to sexual script theory yielded three distinct forms of scripts (Simon & Gagnon, 1998), which are cultural scripts, interpersonal scripts, and intrapsychic scripts. Cultural scripts are “the instructional guides that exist at the level of collective life” (Simon & Gagnon, 1998, p. 29). Cultural scripts are scripts made available by society to individuals so that roles and scenarios can be adapted. An example of a cultural script may be a belief regarding whether a depiction of sex is realistic or not. Interpersonal scripts narrow the scope of scripts from the macro level of cultural scripts to the interpersonal level, explaining how individuals adapt the more abstract cultural scripts to actual behavior (Beres, 2014; Simon & Gagnon, 1998). Interpersonal scripts may involve the negotiation of consent or the perception of a partner’s level of pleasure. Finally, intrapsychic scripts compose the sexual fantasies, imagination, and desires of the individual (Beres, 2014; Simon & Gagnon, 1998). Simon and Gagnon describe these scripts as “the symbolic reorganization of reality in ways to more fully realize the actor’s many layered and sometimes multivoiced wishes” (1998: 30).

These three levels of scripts are distinct, yet work together in order to explain sexual behavior. As stated above, the abstract cultural scripts are adapted to the interpersonal level through interpersonal scripts, and further, are internalized to the individual in ways that inform desires and fantasies through the intrapsychic scripts. The ideas offered by Gagnon and Simon (1973) in their sexual script theory have been employed by researchers attempting to understand the relationship between pornography use and sexual behaviors or attitudes. These studies have found that pornography use is related to sexual scripts, which in turn, are related to such outcomes as engaging in casual

sex (Braithwaite, Aaron, et al., 2015; Braithwaite, Coulson, et al., 2015), hostile attitudes towards women (Wright & Bae, 2015), and engaging in sexual activities commonly featured in pornography (Bridges et al., 2016; Sun et al., 2016). These studies have not only shown that sexual scripts mediate the relationship between pornography use and sexual behaviors or attitudes, but have done so using longitudinal data (Braithwaite, Aaron et al., 2015; Braithwaite, Coulson, et al., 2015; Wright & Bae, 2015). This provides evidence for time-order not found in the Confluence Model. The focus of the current review, however, will be on research linking pornography use, sexual scripts, and sexually coercive behaviors.

Tomaszewska and Krahe (2016) were the first to examine the role that sexual scripts play in the relationship between pornography use and sexual coercion. Using a sample of 524 Polish high school students, Tomaszewska and Krahe (2016) gathered data on pornography use, risky sexual scripts, and attitudes towards sexual coercion. Pornography use was assessed by asking respondents to respond on a Likert-type scale ranging from never to very often, whether they had seen sexual photos, images of sexual intercourse, and images of other sexual acts (Tomaszewska & Krahe, 2016). Attitudes supportive of sexual coercion were measured by presenting the respondents with a hypothetical scenario where a man and woman are about to engage in sexual activity, but the woman says no. They are then required to indicate their level of agreement with a series of statements that may justify the man using physical force or verbal threats to obtain sex, and include such statements as “he is so aroused he cannot stop himself anymore” and “she led him on.” Their responses to these 14 statements were then averaged to create an “acceptance of sexual coercion” scale. Finally, sexual scripts were

measured using a series of Likert-type questions assessing the respondent's own ideas about how they engage or do not engage in casual sex, substance use before or during sex, communication of sexual intentions, and norms about sexual behavior. The scale contained 26 items measuring these concepts, which collectively, were referred to as "risky sexual scripts." The results of their study revealed that pornography use had an indirect effect on attitudes towards sexual coercion. In other words, more frequent pornography use significantly increased acceptance of sexually coercive behaviors through endorsement of risky sexual scripts. The authors posit that pornography use influences an individual's internalized sexual scripts, which in turn informs their acceptance of sexually coercive behaviors.

Building on this line of research, Tomaszewska and Krahe (2018) used the same measures of pornography use and sexual scripts to examine whether a mediating effect exists between these two variables and self-reported sexual coercion. In order to accomplish this, they used a sample of 541 Brazilian college students. Self-reported sexual coercion was measured using the Sexual Aggression and Victimization Scale (SAV-S; Krahe & Berger, 2013), which contains a series of questions assessing both perpetration and victimization using specific coercion tactics. These tactics included physical harm, threat of physical harm, the exploitation of an incapacitated state, or verbal pressure. Items were also broken down into victim-perpetrator relationship, with the instrument including current or former partner, an acquaintance or friend, and a stranger. Together, these questions comprised a 36-item measure of victimization and perpetration of sexual coercion. The authors improved on the methodology of the previous study by using a two-wave design, where first-year college students were

surveyed at the beginning of their first semester, and follow-up surveys were sent to the respondents six months later. The results of their study provide some mixed support for the sexual script theory (Tomaszewska & Krahe, 2018). First, like the previous study, pornography use had a significant indirect effect on attitudes supportive of sexual coercion through risky sexual scripts. Contrary to their hypothesis regarding pornography use, scripts, and self-reported sexual coercion, the authors did not find an indirect relationship between pornography use and self-reported sexually coercive behaviors. What they did find, is that attitudes supportive of sexual coercion increased the likelihood that an individual engaged in sexually coercive behaviors between wave one and wave two. This means that the results of this study do not provide evidence that pornography use works through sexual scripts to influence sexually coercive behaviors, but rather, pornography use and sexual scripts work together to influence correlates of sexual coercion.

A potential explanation for the findings of the two previous studies could lie with the operationalization of scripts. First, Tomaszewska and Krahe (2016, 2018) only focused on one specific type of script: risky sexual scripts. This type of sexual scripts does not encompass all of the various types that an individual can retain. For instance, scripts referring to pleasure, desire, and consent are not included in this measurement. Finally, the measure of scripts used by Tomaszewska and Krahe (2016, 2018) did not account for the three levels of scripts described by Simon and Gagnon (1998). In order to address these shortcomings, Marshall and colleagues (2019) examined whether sexual scripts mediated the relationship between pornography use and sexual coercion using a measure of scripts that accounted for intrapsychic, interpersonal, and cultural scripts. This

measure contained four items measuring the reaction of respondents to a hypothetical dating scenario involving sexual activity. In particular, the scenario involves the woman declining the man's proposition to have sex. For cultural scripts, respondents were asked how realistic they believed the story was, and for intrapsychic scripts, respondents were asked how well they could imagine themselves as the man in the story. Finally, two items were used to assess interpersonal scripts, which assessed the respondent's view of consent given by the woman in the study, and whether the woman experienced pleasure. Responses to each of these four items ranged from 0 to 100%, with zero indicating no endorsement of the statement, and 100 meaning complete endorsement of the statement.

The results of the study indicated that sexual scripts mediated the relationship between pornography use and sexual coercion (Marshall et al., 2019). Support for the three levels of scripts was also provided; the path model indicated that pornography use had an indirect effect on sexual coercion through intrapsychic and interpersonal scripts. In other words, pornography use influenced the respondent's ability to view themselves as the man in the story, which in turn influenced their perception of consent and pleasure in the victim, and this ultimately influenced the likelihood of engaging in sexually coercive behavior.

Marshall and colleagues (2019) note that there is still area for improvement in their operationalization of sexual scripts (e.g., only using four items), but the results of the study did still provide support for the theory, and more specifically, the mechanisms through which the various levels of scripts interact to influence sexual coercion. While more research is needed in this area, the evidence points to sexual scripts as an important

factor to consider when examining the relationship pornography has with a host of sexual behaviors and attitudes, and specifically, sexually coercive behaviors.

Other Pornography Use Variables

Additional variables assessing aspects of pornography use have been included in studies examining the relationship between pornography use and sexual coercion. In particular, these have included number of modalities used to view pornography (Marshall et al., 2018, 2019), age at initial exposure to pornography (Mancini et al., 2012, 2014), and compulsive use of pornography (Gonsalves et al., 2015). The first to be discussed will be number of modalities.

Marshall and colleagues (2018) examined the relationship between pornography use and likelihood of engaging in sexual coercion in their sample of 463 college males. In their assessment of pornography use, they looked at the frequency of pornography consumption, as well as the number of modalities used to view pornography. These modalities included the internet, magazines, movies, and books (Marshall et al., 2018). Much like other studies assessing “likelihood” of sexual aggression (Demare et al., 1993; Marshall et al., 2019), respondents were required to indicate the likelihood of engaging in various coercive behaviors in a hypothetical scenario. The results of their study aligned with findings from previous research; both pornography use variables predicted likelihood of engaging in sexually coercive behaviors (Marshall et al., 2018). What was unique in their findings, was that number of modalities was a stronger predictor of sexual coercion likelihood than frequency of use. Specifically, the authors indicate that when included in the model predicting illegal coercion, frequency of use was no longer significant. The number of modalities remained significant (Marshall et al., 2018).

The authors explain these findings further, by indicating that modalities may serve as a proxy for investment in pornography use. They reason that for all individuals in their sample that viewed only one modality, those individuals reported only viewing internet pornography. This meant that for individuals who viewed more than one modality, it was internet and some other form (e.g., books, magazines, movies). The use of books, magazines, or movies requires that the individual obtain the materials and keep these materials in their home, which implies some sort of monetary investment in their pornography use and a willingness to sacrifice the anonymity afforded by pornography use. In an additional analysis for the study, the authors used an Area Under the Curve statistical procedure to examine whether there are significant cut points in use of pornography that are most predictive of likelihood to engage in sexual aggression. While some cut points for frequency were found, the most notable finding from this study was for modalities: the most significant cut point for number of modalities was between one modality and two or more. This provides further support for the idea proposed by the authors: investment in pornography use may serve as an important aspect of pornography use to assess. Finally, in a more recent study by Marshall and colleagues (2019), they examined whether frequency of pornography use and number of modalities represented a latent factor of pornography use, using a Structural Equation Model. Results of their study provided strong support for this notion, indicating that pornography use is a multi-faceted construct, comprised of a number of variables (Marshall et al., 2019).

Another variable of pornography use that has been less-commonly assessed is age at first exposure. In a series of studies conducted by Mancini and colleagues (2012, 2014), the relationship between age at exposure to pornography and variables relating to

sexual coercion were assessed. The first study conducted by Mancini and colleagues (2012) examined the level of pornography exposure during adolescence, adulthood, and immediately prior to the commission of their offense in a sample of men who had sexually offended. Pornography use across these three age-points was assessed through asking respondents whether they had viewed pornography as an adolescent, as an adult, or immediately prior to their offense. Respondents could reply by either indicating “yes” or “no” (Mancini et al., 2012). The authors for this study used level of physical injury and victim humiliation as a proxy for sexual coercion, which for physical injury, ranged from none to death/mutilation, and for humiliation, ranged from none to physical and verbal humiliation. The results of the analysis indicated that exposure as an adolescent significantly increased the level of physical harm in their offense, as well as the level of humiliation (Mancini et al., 2012), while exposure as an adult was not significant. These findings indicate that exposure to pornography during important developmental periods may increase the severity of sexually coercive behaviors (Mancini et al., 2012).

Mancini and colleagues (2014) followed up this study by examining the relationship between age at exposure to pornography and age at onset of offending. In line with the findings from their previous study, exposure to pornography during adolescence significantly decreased the age of onset at offending. An additional analysis included in this study assessed whether pornography use during adulthood was related to the frequency of offending behaviors (Mancini et al., 2014). Also in line with the findings from their previous study, the researchers found that exposure during adulthood was not related to the frequency of offending. A notable absence in this paper, however, is an analysis of the relationship between adolescent pornography consumption and frequency

of offending in adulthood. The findings from these two studies seem to indicate that pornography use during adolescence may affect sexually coercive behaviors much more than pornography use during adulthood, yet the authors do not examine this relationship. That being said, the results from these two studies bolster the idea that age at exposure shows promise as an important variable to assess when measuring an individual's use of pornography.

Finally, one study has demonstrated a significant relationship between compulsive pornography use and sexual coercion (Gonsalves et al, 2015). Compulsive use of pornography was measured through an instrument called the Internet Sex Screening Test (ISST; Delmonico & Miller, 2003). According to the authors, some of these items were altered to specifically assess the use of internet pornography (Gonsalves et al., 2015). Two distinct findings were revealed in this study. First, the authors found that individuals who had engaged in sexually coercive behavior scored significantly higher on measures of compulsive internet pornography use, when compared to individuals who had not engaged in sexually coercive behaviors (Gonsalves et al., 2015). Finally, Gonsalves and colleagues (2015) indicated that the number of sexually coercive behaviors significantly predicted the level of compulsive pornography use. These results indicate that compulsive pornography use may serve as another aspect of pornography use that warrants assessment.

Summary of Findings

After a comprehensive review of the literature, it is evident that there are a number of aspects surrounding pornography use that seem to be driving its relationship with sexual coercion. Namely, there are a number of habitual factors, such a frequency of

use, investment in use, and age at first exposure, that have been shown to be related to sexually coercive behaviors. In addition to these habitual factors, it is evident that use of violent pornography is significantly related to sexual coercion, as well as compulsive use of pornography. Finally, researchers have begun to demonstrate that sexual scripts adopted from pornography play a significant role in the relationship between pornography use and sexual coercion. These studies do provide ample evidence for the relevance of these factors, yet there remain some inconsistencies. A closer look at the inconsistent methods used by researchers may provide insight further insight.

First, as noted earlier in the review, a number of these studies examine pornography use across a number of different mediums. Furthermore, researchers have conflated other acts, such as attending strip clubs, with pornography use. Individuals claiming to assess “frequency of pornography use” may actually be measuring widely different behaviors because of these inconsistencies. Second, when looking at the operationalization of type, a number of inconsistencies can be found. Though some studies used items assessing whether the respondent viewed pornography where an actor or actors appear to be hurt, some studies included child pornography or degrading behaviors in their operationalization of violent pornography. Finally, results regarding the importance of sexual scripts were somewhat inconsistent, but as stated earlier in the review, this may be due to the inconsistencies in the operationalization of scripts. Beyond specifically focusing on one type of script, many studies failed to address the multi-faceted nature of the sexual script theory described by Simon and Gagnon (1998). Together, the inconsistencies in these findings have warranted a systematic assessment of

the methods used to assess pornography. The following section will review findings from these systematic reviews.

Measurement of Pornography Use

The body of research on pornography use and sexual coercion has yielded a wealth of knowledge, both from studies conducted in laboratory settings, and those using self-report surveys. A concern for the latter involves inconsistencies in the methods used to measure pornography use. The chief concerns raised by researchers are the conceptualization and operationalization of pornography use, as well as the lack of established reliable and valid instruments. The following sections will address both of these issues, focusing first on a series of studies summarizing the heterogeneous methodologies utilized to measure pornography use, then providing a comprehensive review of all of the available instruments for measuring pornography consumption.

Conceptualization and Operationalization of Pornography Use

Nearly 15 years after self-report surveys became the primary method of examining the relationship between pornography use and sexual coercion, the first comprehensive review of the conceptualization and operationalization of pornography consumption was conducted. Short and colleagues (2012) understood two important aspects of research in this arena that had to be addressed, in order to be sure that confidence could be placed in the findings produced by these studies. First, they realized that developing some sort of “standardized” definition of pornography use was integral. As stated by the authors, “if a definition of pornography is not provided, one is left to assume that all participants have the same conceptualization of the term and any inconsistencies in studies may be due to differences in how IP [internet pornography] is

defined” (Short et al., 2012; p. 13). Finally, Short and colleagues (2012) noted the importance of using validated measurements when looking at pornography use and sexual aggression. The relatively scant number of assessments available led Short and colleagues (2012) to hypothesize that use of validated measures was limited, and the results from their study confirmed this idea.

Methods employed by Short and colleagues (2012) to conduct the review involved using the search terms “internet pornography” and “sexually explicit material” to locate studies. As for exclusion criteria, Short and colleagues (2012) excluded studies that used offender samples, samples with individuals under the age of 18, and any studies that were published more than 10 years before their data collection. Article collection for the study began in April of 2010 (Short et al., 2012). While the exact process of article identification was not covered in the manuscript (e.g., how many articles were initially discovered, how many duplicates were removed, and how many were removed after exclusion criteria was applied), Short and colleagues (2012) state that 44 studies were ultimately included in the analysis. The examination of the articles involved determining if a definition was given to the study participants, and if so, what the exact definition was, as well as recording specific details on the measurement of pornography use (i.e., Likert or dichotomous questions, specific aspects of use, use of author-generated questions). Results of their analysis provided insightful, and somewhat troubling information about the state of pornography use measurement.

First, Short and colleagues (2012) found that the overwhelming majority of studies did not provide a definition of pornography use (86%). Furthermore, among the 14% of studies that did provide definitions, there was no overlap. In other words, all of

the definitions given to respondents were different across studies. For example, one study defined pornography as specifically internet material (Fisher & Barak, 2001), while another included a number of mediums in their definition, such as magazines, movies, and books (McKee, 2007). Additionally, the studies differed in their definitions of content that was considered pornographic, with some requiring that the images or videos showed individuals engaged in having sex (Braun-Courville & Rojas, 2009), whereas others just require that they explicitly show the genitals of individuals while engaging in sexually explicit behaviors (Hald, 2006).

Finally, Short and colleagues (2012) examined the specific methods employed to measure pornography consumption, and much like their assessment of definitions, their results indicated a pattern of inconsistency. The majority of studies used a single method to assess pornography use (62%). In other words, the authors for these studies only used one question in their operationalization. The authors varied widely in their approach to measuring use, with a majority employing Likert-type items, and others using yes or no questions, or checklist-type questions (i.e., “check all that apply”). Finally, the results showed that the majority of studies only measured the frequency of pornography use, with only 14% of the studies accounting for the type pornography that respondents used.

The study conducted by Short and colleagues (2012) provided a much-needed survey of the methods employed by researchers measuring pornography use, but this study was not without its limitations. First, the search terms were relatively limited in scope. Because the term “internet” was included with pornography, this could have left out studies that were not just concerned with internet pornography, but pornography use in general. More researchers are also employing the term “sexually explicit media” to

refer to pornography, and this term was not used in their search strategy. Second, was the exclusion of certain databases that are likely to contain articles of importance, such as “SocIndex.” Finally, though the authors provided reasons for excluding studies involving offender or deviant populations, for many of the studies examining the relationship between pornography use and sexual coercion, this is an integral population to study. A more recent systematic review conducted by Marshall and Miller (2019) attempted to address some of these shortcomings, as well as provide an updated assessment on the conceptualization and operationalization of pornography use.

First, like Short and Colleagues (2012), the authors used the terms “sexually explicit material,” but in addition, they used “sexually explicit media,” since this term has frequently been used in research and is becoming more common. Furthermore, instead of using the term “internet pornography,” Marshall and Miller (2019) used just “pornography,” in order to capture studies where the researchers were not just focused on internet pornography. Databases included in the review were “SocIndex,” “PsycInfo,” and “Criminal Justice Abstracts.” The inclusion of “SocIndex” was a notable improvement on the approach used by Short and colleagues (2012), since the largest portion of articles were retrieved from this database. Finally, Marshall and Miller (2019) did not exclude studies containing offender or deviant populations. Initial searches for articles revealed 5,692 studies, and after duplicates were accounted for, this was reduced to 4,510. Following the application of exclusion criteria to the abstract, and then the full manuscript of each study, Marshall and Miller (2019) were left with 313 articles. The authors approached article examination much like Short and colleagues (2012); the focus was looking at the number of studies that provided definitions of pornography, what

those definitions were, the aspects of pornography consumption that were assessed, the types of questions used, and whether previously developed assessments of pornography use were used. The results of their study mirrored Short and colleagues' (2012) work.

Only about 18% of the studies included in the review provided some sort of definition of pornography to their respondents, which is a similar proportion to the studies included in the review by Short and colleagues (2012). Heterogeneity was still apparent in these definitions, but there were patterns that emerged in the themes of these definitions. The definitional themes identified by Marshall and Miller (2019) included defining by the content, defining by the content and intended use of material, defining by exclusion of material, defining by medium, and defining by the intended use of the material. Most common among these themes was defining pornography by its content. In other words, pornography was defined by what material was portrayed, such as media depicting exposed genitals and certain sexual acts (Peter & Valkenberg, 2009). The second most common approach involved the content and the intended use of the material. These definitions included content-specific qualifiers, but also specified that the content was intended for enhancing sexual arousal or excitement for the viewer (Kraus et al., 2015). For some researchers, pornography was defined by specifically excluding certain materials. Marshall and Miller (2019) note that a number of studies made sure to define pornography by excluding materials such as Playboy or Playgirl, in order to prevent participants from identifying certain materials as pornographic (Traeen & Daneback, 2013). Finally, and less frequently, some researchers defined pornography specifically by the medium where it was accessed (i.e., internet) and by only the intended use of the material.

While some of these differences may seem somewhat trivial, Marshall and Miller (2019) note some important implications from these findings. First, like Short and Colleagues (2012), the results indicated that a large majority of studies did not provide a definition of pornography use, and when definitions were provided, they differed widely. The pitfalls of this approach have already been touched on, but Marshall and Miller (2019) provide some suggestions for improvement. In particular, they state that the content-specific and intended use approach appeared to be the most beneficial. Practically speaking, approaches using both qualifiers should prevent individuals from conflating mainstream media containing explicit sexual acts with pornography. In theory, this should improve the specificity of assessments of pornography use. Additionally, recent research examining public perceptions of pornography use provide support for conceptualizing pornography as a multi-dimensional construct (Busby et al. , 2017). Regardless, it remains evident that if researchers want the ability to be confident in the stability of findings across studies, more standardization is necessary in how pornography is defined.

Next, Marshall and Miller (2019) examined the different methods use to assess pornography consumption. Like Short and colleagues (2012), frequency of use was the most commonly measured aspect of pornography use. Results of their analysis indicated that 98% of the articles assessed frequency of use. Though this was a common aspect, the methods used to assess frequency differed widely. First, item stems employed a variety of terms to refer to pornography. Specifically, porn, pornography, pornographic material, X-rated, sexual explicit media/material, and erotica/cyber-erotica were all used in author-generated item stems (Marshall & Miller, 2019). Some stems did not include any of the

above terms and specifically described the media, much like the content-specific definitions discussed previously. As for response types, Likert, dichotomous, and continuous options were available to participants. Methods for these approaches also varied widely, with Likert-type responses ranging from never to very frequently, never to several times a day, and the number of times in a specific period (i.e., the past month). Continuous response types mirrored this, with participants asked to indicate the number of minutes/hours in the last week they spent viewing pornography and the number of times in the past six months that they viewed pornography.

Two major issues were identified by Marshall and Miller (2019) in the methods used to assess frequency of use. First, the terms used to refer to pornography in the item stems varied, and while this variance may not seem problematic, research has found that some of the commonly used terms are not considered synonymous with pornography. In particular, Willoughby and Busby (2016) found that terms such as “erotica” and “adult materials” invoke an image of “substantively different material compared to pornography” (Marshall & Miller, 2019; p. 175). Finally, a significant number of studies used a single item simply asking whether an individual used pornography in the previous 12 months. Researchers have indicated that there are likely meaningful thresholds beyond which pornography use becomes more strongly associated with sexual coercion (Malamuth, 2000; Marshall et al., 2018), and dichotomous questions like these preclude researchers from having the ability to detect these thresholds.

Type was the next most common aspect of pornography use assessed and only accounted for about 20% of the studies included in the review. Researchers varied widely in the types of pornography they assessed, such as “risky sex,” physical aggression,

mainstream, humiliation, paraphilia, consensual or non-consensual, and child pornography. It should be noted that these studies examined a wide variety of correlates, such as safe sex practices. This means that researchers may be more interested in types like “risky sex” than violent or non-violent pornography. For the purpose of the current review, the focus will be on the assessment of violent or aggressive types of pornography. Terminology used by researchers to measure use of violent pornography widely differed, with a majority of researchers simply asking respondents whether they viewed violent or rape pornography (Marshall & Miller, 2019). Though less common, Marshall and Miller (2019) indicated that some researchers asked respondents whether they viewed pornography where the individuals in the material appeared to be hurt or in pain, and one researcher in particular used a scale of various physical acts, such as slapping and hitting, to assess consumption of violent pornography.

The variance in the assessment of type is not considered by the authors to be the most prominent issue with these studies. The main issue identified by Marshall and Miller (2019) is the fact that a large amount of material that is considered “mainstream” actually contains explicit acts of violence and aggression. Bridges and colleagues’ (2010) content analysis reveals how much aggression exists in mainstream pornography. Simply asking individuals whether or not they view pornography that is labelled “violent” or “rape” may fail to capture individuals who view “mainstream” pornography that contains coercive acts (Marshall & Miller, 2019). The method employed by Foubert and Bridges (2017) can serve as a more appropriate method to assess use of violent pornography. For their study, they used a 44-item scale asking individuals whether or not the pornography they view contains certain acts of aggression, such as choking, spanking, or slapping.

Scales such as these will provide more variance, statistical strength, and improved sensitivity to examine problematic thresholds of violent pornography use.

Finally, the authors noted that almost 30% of the studies included in the review measured respondents' habits and history related to pornography use. These factors covered a wide range of pornography use habits, such as age at first exposure, typical modality and number of modalities, duration of pornography use, motivation, monetary investment, whether the individual uses it alone, and where the individual normally consumes pornography. As was expected, studies were inconsistent in measuring these factors, with typical modality being the most commonly assessed habitual factor. Marshall and Miller (2019) state that these factors other than frequency, such as age at first exposure and number of modalities used, show some promise as predictors of sexually coercive behaviors (Burton et al., 2010; Mancini et al., 2012; Marshall et al., 2017, 2018). Thus, assessment of these variables should be more common in research. The findings of the review indicate that this is not the case; less than 10% of studies accounted for age at first exposure, and only two of the 313 articles included number of modalities. Empirical evidence of the importance of these factors, however, warrants inclusion in future research.

The final purpose of Marshall and Miller's (2019) systematic review was examining the use of previously established instruments to assess pornography use. Contrary to Short and colleagues' (2012) study, use of researcher-generated items was not as ubiquitous; a slightly higher number of studies incorporated previously established instruments into their methodologies. The psychometric integrity of these instruments, however, lacked the vigor necessary to place confidence in their use. According to

Marshall and Miller (2019), only one study (PCQ; Hald & Malamuth, 2008) went beyond providing Cronbach's alphas for the instrument. The authors of this instrument used factor analysis to present additional evidence of psychometric qualities. Succinctly put, Marshall and Miller (2019) state that "the use of the instrument is only as beneficial as the psychometric integrity of the instrument" (p. 176). Finally, it is shown that while the use of previously developed instruments was slightly higher, these studies only accounted for about five percent of the studies in the review. It is noted that the infrequent use of instruments, though troubling, may not be because there is a lack of instruments, but that the quality, age, and scope of these instruments may make researchers apprehensive to incorporate them in their approach (Marshall & Miller, 2019). In fact, there are a number of instruments that have been developed, and the following section will provide a comprehensive review of these assessments, their purpose, and psychometric qualities.

Assessments of Pornography Use

Both systematic reviews by Short and colleagues (2012) and Marshall and Miller (2019) indicated that use of previously established instruments for measuring pornography use was the exception, rather than the rule. This is not to say, however, that the field is lacking instruments developed for this purpose. There are a number of different measures that have been in development over the past few decades. As with much of the research on pornography use, these instruments vary widely in their scope and purpose. A comprehensive list of these instruments can be seen in Table 1.

Table 1*Summary of Pornography Measures*

	Year	# of items	Definition	Reliability	Validity
Pornography Consumption Questionnaire (PCQ)	2006	139	Yes	Internal; factor analysis	None provided
Online Pornography Survey (OPS)	2007	54	Yes	Internal	None provided
Sexually Explicit Media Questionnaire (SEMQ)	1999	11	Yes	Internal	Construct
Exposure to Sexual Materials Questionnaire (ESMQ)	1997	20	No	Reliability; factor analysis	Construct
Pornography Consumption Inventory (PCI)	2011	15	Yes	Internal	Convergent
Cyber-Pornography Use Inventory (CPUI)	2010	9	No	Internal	Convergent; divergent
Problematic Pornography Use Scale (PPUS)	2014	12	Yes	Internal	Convergent
Compulsive Pornography Consumption (CPC)	2014	5	No	Limited internal	Convergent and divergent

After a cursory look at the table, a few things become evident. First, a number of these instruments were designed to assess compulsive use of pornography, while others focus the motivation of pornography consumption or providing a general questionnaire of pornography use habits. If these instruments have been available to researchers, why has the use of researcher-generated questions dominated this body of literature? In order to answer this question, it will be necessary to examine the purpose of these instruments, as

well as the evidence for their psychometric integrity. The following portions will include a discussion of these aspects of the instruments.

The Pornography Consumption Questionnaire

This Pornography Consumption Questionnaire (PCQ) was developed by Hald (2006) in order to “investigate gender differences in pornography consumption...and to examine gender differences in situational, interpersonal, and behavioral characteristics of pornography use.” Hald (2006) defined pornography for the respondent in the first part of the four-part 139 item questionnaire, which was:

Any kind of material aiming at creating or enhancing sexual feelings or thoughts in the recipient and, at the same time (1) containing explicit exposure and/or descriptions of the genitals and (2) clear and explicit sexual acts such as vaginal intercourse, anal intercourse, oral sex, masturbation, bondage, sadomasochism (SM), rape, urine sex, animal sex, etc. (p. 78).

Hald (2006) also made it clear to the respondents that materials like *Playboy* should not be considered pornography, since these materials do not depict explicit sexual acts. The second part of the PCQ included sociodemographic items, and for females, two questions regarding contraceptive use and menstrual cycle. For the third portion, Hald (2006) included items on “exposure (to pornography) patterns within the past 12 months, age at first exposure, time and frequency of exposure, development in consumption patterns, preferences in pornography, personal and interpersonal context of exposure, money spent on pornographic materials, and sexual behavior” (p. 80). The final portion of the PCQ consisted of questions assessing whether the respondent experienced positive or negative effects resulting from pornography use. In the original article where the PCQ

was introduced, Hald (2006) did not provide any reliability or validity results. While the PCQ was used in some studies following the original study (see Hald & Malamuth, 2008; Hald & Mulya, 2013; Hald & Malamuth., 2015), these studies did not provide any psychometric assessment of the instrument. Hald and colleagues (2015) only used four items from the PCQ, and while the authors reported that these items were highly correlated, this only provided nominal evidence of reliability. Finally, a modified version of the PCQ was used in two other studies, but reliability and validity statistics were not reported (Hald & Malamuth, 2008; Hald & Mulya, 2013).

Online Pornography Survey

The Online Pornography Survey (OPS) is a 54-item instrument adapted by Seigfried (2007) from the Computer Crime Index (CCI; Rogers, 2001). The purpose of the instrument is to “assess respondents’ pornography behaviors, including intentional searching, accessing, downloading, and exchanging of sexually explicit internet images” (Seigfried-Spellar, 2016, p. 38). The instrument is comprised of Likert-type items, though the items vary in response options provided to respondents. A limited amount of information was provided regarding the instrument in the manuscripts that used the OPS; there was no comprehensive presentations of the items contained on the instrument and only a limited discussion of content of the items. Seigfried-Spellar (2016) provides an example of one of the items on the survey concerning age at first exposure to pornography: “How old were you the first time you knowingly accessed a website in order to view pornographic materials featuring individuals *under* the age of 18 years?” (Seigfried-Spellar, 2016, p. 38). According to the authors, the response options ranged

from “under 12 years of age” to “24 years of age or older” (Seigfried-Spellar, 2016). They also provided a “refuse to answer” option.

In the original study, as well as in several studies following the initial adaptation of the instrument (see Seigfried-Spellar, 2016; Seigfried-Spellar & Rogers, 2013), some evidence was provided for reliability. For instance, Seigfried-Spellar and Rogers (2010) found that the OPS demonstrated excellent reliability in their sample of 152 women ($\alpha = .92$). Seigfried and colleagues (2008) also found that the OPS demonstrated excellent reliability ($\alpha = .91$) in their sample of 307 individuals from the general population. It should be noted that some of these assessments of reliability only contained portions of the instrument. Seigfried-Spellar and Rogers’ (2010) study only included items on the instrument that assessed use of child pornography. Furthermore, even in studies where the reliability of the entire OPS was provided, the studies only used the OPS as a proxy for whether or not an individual reported using child pornography, thus limiting the ability to derive any evidence of validity or support for the reliability of the instrument’s domains.

Sexually Explicit Media Questionnaire

The SEMQ (Wryobeck et al., 1999) was developed as a part of a study examining sexual narcissism among college men. The authors created 11 items assessing the number of times an individual viewed four types of pornography over the previous six months. According to Wryobeck and colleagues (1999), these four types consisted of the following:

- (a) ‘Sexual magazines available at outlets such as convenience stores and

newsstands. Examples include *Playboy*, *Penthouse*, and *Hustler*'; (b) 'Sexual magazines or books that show actual sexual intercourse and other sexual acts, such as those usually available only in 'adults only' bookstores'; (c) 'Movies or videos that include graphic but simulated sexual acts, such as those rated X or NC-17'; and (d) 'Movies or videos that show actual intercourse and other acts, such as those usually found in 'adults only' (XXX) sections of video rental stores'. (p. 326)

The reported internal reliability for the measure was found to be acceptable ($\alpha = 0.76$) and there was moderate evidence for construct validity, with scores on the SEMQ being significantly correlated with measures of sexual narcissism. Beyond the initial examination, it was used in one latter study. Wurtele and colleagues (2014) used the measure in their study of men's sexual interest in children, but only provided evidence for internal reliability ($\alpha = 0.85$). It should be noted, that the version used for this study was altered in several ways. First, the authors were concerned with early exposure to pornography, rather than current exposure. Thus, Wurtele (2014) and colleagues modified the item stems to reflect pornography use before the age of ten, rather than number of times in the past month. The response options were also changed, with respondents being required to respond to Likert-type items ranging from never to daily, rather than responding numerically to number of times within the past month.

Exposure to Sexual Materials Questionnaire

The ESMQ (Frable et al., 1997) was developed as a part of a study assessing the relationship between pornography and a number of attitudinal measures. Particularly, the way the viewer perceives women and men. Originally, the authors developed 70

questions assessing the use of sexually explicit newspapers, movies, catalogs, books, magazines, and stores. Seven open-ended questions were included in the original measure, and the remaining items were Likert-type items, with response options involving the number of times the individual used porn in the past three years. Response options ranged from never to more than 100 times. The authors stated that because a lack of uniformity was found among the open-ended questions, these were removed from the study (Frable et al., 1997). After running principle component analysis, seven interpretable factors with 29 of the items were revealed. Nine of these items were removed for various reasons, such as low factor-loadings and irrelevant items. Frable and colleagues (1997) were then left with a 20-item single-factor instrument assessing frequency of pornography use, type of pornography used, and investment in pornography use. According to the authors, the 20 items demonstrated good reliability ($\alpha = 0.84$), and factor loadings ranging from .20 to .72, with an average factor loading of .49. As for construct validity, the authors revealed that scores on the ESMQ were significantly related to measures of traditional gender roles and viewing women as purely sexual objects. Unfortunately, no further psychometric assessment of this instrument could be found.

Pornography Consumption Inventory

The purpose of PCI is to assess the function of pornography use in the respondent (Reid, 2011). This is accomplished by assessing the function of pornography consumption using 15 items answered on a 5-point Likert-type scale across four domains, which are labeled: Emotional Avoidance, Sexual Curiosity, Excitement Seeking, and Sexual Pleasure. Examples of the items in each domain include: "I turn to it when I am

feeling down, sad, or lonely” for Emotional Avoidance, “It fuels an interest I have to understand more about sex” for Sexual Curiosity, “It gives me a sense of excitement” for Excitement Seeking, and “I use it to sexually arouse myself” for Sexual Pleasure (Reid, 2011, p. 245).

Reid and colleagues (2011) found that the PCI demonstrated “modest” divergent and convergent validity within the subscales. Specifically, they found significant positive correlations between the Emotional Avoidance, Excitement seeking, and Sexual Pleasure subscales, demonstrating evidence for convergent validity. Evidence for discriminant validity was also found by Reid and colleagues (2011). The Emotional Avoidance subscale showed a significant negative correlation with Positive Emotions, and the Sexual Curiosity subscale was not correlated with any of the measures of emotional dysregulation, such as anxiety, depression, vulnerability, positive emotions, and self-discipline ($r = -.17$). Construct validity for the PCI was demonstrated through significant positive correlations between the Emotional Avoidance subscale and measures of anxiety, depression, and impulsiveness. Additionally, the subscale measuring Sexual Curiosity was found to be positively correlated with impulsiveness and fantasy. Reliability for the measure was also tested, and results indicated that the overall scale had a Cronbach’s alpha value of .93, and each scale also demonstrated good-to-excellent reliability (Emotional Avoidance, $\alpha = .95$, Sexual Curiosity, $\alpha = .89$, Excitement Seeking, $\alpha = .85$, Sexual Pleasure, $\alpha = .90$). Finally, test-retest reliability analysis were conducted and Reid and colleagues (2011) found the PCI demonstrated good test-retest reliability ($r = .87$).

While Reid and colleague's (2011) initial study demonstrated good psychometric properties for the PCI, the samples utilized in this study consisted of hypersexual men, which is the population for which it was designed to be used. Other studies have examined the reliability and validity of the PCI in other samples. One such study analyzed the reliability and validity of the PCI in 250 Brazilian college males (Baltieri et al., 2015). Baltieri and colleagues (2015) indicated that their results "confirmed the factorial validity and the internal consistency of the PCI." Cronbach's alpha for the entire measure was $\alpha = .86$, and each scale demonstrated acceptable-to-good internal reliability (Emotional Avoidance, $\alpha = .86$, Sexual Curiosity, $\alpha = .78$, Excitement Seeking, $\alpha = .73$, Sexual Pleasure, $\alpha = .87$). Baltieri and colleagues (2015) also found that the Emotional Avoidance scale was positively associated with scores on the Beck Depression Inventory (Beck et al., 1974), which demonstrated moderate evidence of construct validity. One change that Baltieri and colleagues (2015) made to the PCI was excluding item ten, which was "I use it to change my mood when I'm feeling anxious, stressed, or angry." Excluding this item from their analysis resulted in a significant improvement in the overall fit of the measure (Baltieri et al., 2015).

The reliability and validity of the PCI was also examined by Baltieri and colleagues (2015) in a sample of 250 Brazilian college women. Findings from this study mirrored the previous study conducted with men. Finally, Silva and Baltieri (2015) tested the validity and reliability of the PCI in a sample of 106 zoophilic individuals. Once again, the PCI demonstrated excellent internal reliability, with an overall Cronbach's alpha of $\alpha = .90$, and good-to-excellent reliability for each subscale reliability (Emotional Avoidance, $\alpha = .89$, Sexual Curiosity, $\alpha = .92$, Excitement Seeking, $\alpha = .91$, Sexual

Pleasure, $\alpha = .94$). Convergent validity was demonstrated through a significant positive correlation between both the Emotional Avoidance and Sexual Curiosity subscales, and construct validity was demonstrated through significant a correlation with a measure of excitement seeking. While research on the PCI has provided evidence which indicates that it demonstrates reliability and validity, it is not without limitations. Firstly, the assessment does not collect any data on the frequency, duration, or type of pornography viewed. The PCI focuses entirely on the function of pornography use. Secondly, the definition of pornography given by the authors of the PCI is any media that “creates or elicits sexual feelings or thoughts and contains explicit images or descriptions of sexual acts involving the genitals” (Reid et al, 2011). A crucial concept left out of this definition is the purpose of the material. In the PCQ (Hald, 2006), it is explicitly stated that the purpose of the material is to create or enhance sexual feelings, whereas the definition given by Reid and colleagues (2011) only specifies that the material “creates or elicits sexual feelings.” While this may seem trivial, providing a concise definition of pornography is of the utmost important when attempting to assess pornography use.

Cyber-Pornography Use Inventory

The CPUI, developed by Grubbs and colleagues (2010), was based on the Internet Sex Screening Test (ISST; Delmonico & Miller, 2003). The ISST is based on the principle stating “addictive behavior is characterized by an inability to stop the behavior, significant negative effects as a result of the behavior, and a generalized obsession with the behavior” (Delmonico & Miller, 2003, p. 321). This principle is not just true in internet addiction as outlined in the ISST (Delmonico & Miller, 2003), but in substance addiction, sexual addiction, and impulse control disorders. It is noted that while Grubbs

and colleagues (2010) based the CPUI on the ISST, the ISST was developed to assess internet sexual addiction, whereas the CPUI focuses specifically on internet pornography addiction.

The CPUI initially consisted of 40 items divided into six subscales that could be answered on a Likert scale from “strongly disagree” to “strongly agree,” and from “never” to “always” (Grubbs et al., 2010). Factor analysis revealed a 31-item measure divided into three factors. The first factor contained 18 items and was called “Addictive Patterns.” Cronbach’s alpha for the first factor indicated that the factor demonstrated good internal reliability ($\alpha = .89$). The second factor was named “Guilt Regarding Online Pornography Use,” and contained 9 items. Cronbach’s alpha for this subscale indicated that the factor demonstrated good reliability as well ($\alpha = .83$). Finally, the third factor, referred to as “Online Sexual Behavior-Social,” consisted of 5 items and demonstrated good internal reliability ($\alpha = .84$). The CPUI was utilized in a later study by Egan and Parmar (2013) for use with an internet sample of 226 males gathered from sports, social media, and psychology websites. The version utilized in this study was the original 40-question, six-subscale version. Egan and Parmar (2013) provided Cronbach’s alpha scores for only two of the six subscales (Compulsivity, $\alpha = .73$, Social Use, $\alpha = .76$), and noted that the other four subscales were dropped due to low internal validity.

A final revision was made to the CPUI by Grubbs and colleagues (2015), which reduced the 31-item measure to nine items, and the name of the measure was changed to the CPUI-9. The revision is comprised of three factors containing three items. Factors for this revision included Emotional Distress, Perceived Compulsivity, and Access efforts (Grubbs et al., 2015). In order to make these revisions, Grubbs and colleagues (2015)

used a sample of college students enrolled in psychology courses, a general population web sample, and a clinical sample of students seeking help for various psychological issues. Good-to-excellent internal reliability for Compulsivity ($\alpha = .81$), Efforts ($\alpha = .75$), and Distress ($\alpha = .85$) were demonstrated in the factors. Evidence of convergent validity was provided through significant correlations between the three subscales and measures of pornography use, psychological distress, and neuroticism. Divergent validity was demonstrated through significant negative associations with self-control and social desirability. Though moderate evidence of reliability and validity for the CPUI-9 was provided in these studies, it is not without its limitations. The main limitation for this measure, is that it is solely focused on perceived internet addiction. In other words, the instrument provides no information regarding history of use, current use patterns, or other important issues.

Problematic Pornography Use Scale

The Problematic Pornography Use Scale (PPUS) developed by Kor and colleagues (2014) is another example of a measure of pornography use that focuses on measuring compulsive pornography use. Development of the items in the PPUS involved adapting items found in the Internet Addiction Test (Young, 1998), the Hypersexual Disorder Questionnaire (Reid et al., 2012), and the CPUI (Grubbs et al., 2010). Combining items from these different questionnaires helped bridge the gap between research that associates elements of the hypersexual disorder found in the DSM-V (Reid et al, 2011), other addictions such as gambling or internet addiction (Kor et al, 2014), and what previous research has already found in terms of pornography addiction (Grubbs et al., 2010; Grubbs et al., 2015).

The combination of items from these previous assessments resulted in an initial measure containing 21 items, and after analysis, was revised and shortened into a 12-item scale consisting of four factors. These four factors contained three items each that could be answered on a seven-point Likert-type scale, and were called: Distress and Functional Problems, Excessive Use, Control Difficulties, and Use for Escape/Avoid Negative Emotions (Kor et al., 2014). The initial study by Kor and colleagues (2014) indicated the PPUS demonstrated excellent internal reliability ($\alpha = .92$), and each factor demonstrated acceptable-to-excellent internal reliability (Distress and Functional Problems, $\alpha = .91$, Excessive Use, $\alpha = .86$, Control Difficulties, $\alpha = .75$, Use for Escape/Avoid Negative Emotions, $\alpha = .93$). Convergent validity and construct validity was also examined by Kor and Colleagues (2014). For convergent validity, results of the analysis indicated that there was a significant positive correlation between internet pornography use and the total score on the PPUS. For construct validity, the authors stated that the total score on the PPUS was significantly associated with attachment anxiety, avoidance, poor self-esteem, and emotional insecurities, as well as other hypothesized correlates of problematic pornography use such as hypersexuality disorder and gambling addiction.

One limitation noted by the authors involved the sample used to refine the instrument. The sample used for this study consisted of Israeli men, whom the authors state are predominately religious. Previous research has found that religiosity can influence an individual's perception of guilt in regards to pornography use, thus increasing the perception of pornography consumption being problematic (Grubbs et al., 2010). Another limitation that should be noted is the definition given in regards to pornography. The definition provided for this measure was the same as the definition

given for the PCI, which omits the idea that the purpose of the media is to facilitate sexual feelings and to enhance various sexual acts. In order to strengthen the findings of this measure, future research must focus on a more generalizable population, as well as refining the definition of pornography that is given to respondents.

Compulsive Pornography Consumption

The final measure that will be reviewed is the Compulsive Pornography Consumption Scale (CPC) developed by Noor and colleagues (2014). This measure was developed in order to assess compulsive pornography consumption. The six items created for this measure were adapted from definitions provided in the DSM-V regarding obsessive thoughts and compulsive behaviors (Noor et al., 2014). These six items could be answered on a seven-point Likert-type scale, ranging from “very frequently” to “never.” The results of the analysis indicated that the CPC contained two factors, one pertaining to “obsessive thoughts or preoccupation with pornography,” and the second involving “compulsive or problematic pornography use” (Noor et al., 2014). Both studies assessing the psychometric qualities of the CPC provide reliability information. In the first study, Noor and colleagues (2014) the entire measure demonstrated good internal reliability ($\alpha = .85$), but did not provide any information on the two subscales. The second study yielded the same value for internal reliability ($\alpha = .85$), and did not provide values for the subscales (Rosser et al., 2014). Convergent and divergent validity for the CPC was explored by Rosser and colleagues (2014). Results of their analysis indicated that the scores on the CPC were positively associated with negative affect, and negatively associated with social desirability and sexual self-esteem. As for limitations, the authors of the measure state that this measure is intended to measure problematic pornography

use in homosexual males, and there have not been any studies that have validated this measure in other populations.

Summary of Findings

After reviewing the existing measures of pornography use, several issues become evident. First, none of the instruments reviewed address all of the factors surrounding pornography use that have been shown to be related to sexual coercion. The majority of these instruments focus on one or two factors surrounding pornography consumption, which are typically measures of compulsive pornography use, or an assessment of motivations. Even the most comprehensive measure, the PCQ (Malamuth, 2000), failed to address compulsivity and scripts. Second, aside from the PCI (Reid et al., 2011), most of these instruments were subjected to minimal amounts of psychometric evaluation. This limits the confidence that researchers may have when using these instruments. Finally, the most recent measure of pornography consumption was developed in 2014. Beyond this, most instruments were developed before the prominence of modern-day “tube” websites, which offer countless hours of every kind of pornographic material for free, as well as before the advent of smartphones, which are currently the most common way reported by individuals to access pornography. The near ubiquity of researcher-generated items found in previous systematic reviews (Marshall & Miller, 2019; Short et al., 2012) should come as no surprise, since it is evident that there is not a valid, reliable, comprehensive, and relevant measure of pornography use that is available to researchers.

Current Study

Research on pornography use has revealed several important factors that inform the purpose of the current study. First and foremost, the consumption of pornography is now nearly universal. The billions of dollars generated by the pornography industry and the millions of daily users of pornographic websites highlight this point, and with the commonality of devices such as smartphones and tablets, this usage will likely grow. With this growth in consumption, society has also seen evidence of a shift in the content of pornography, with researchers highlighting the increasingly aggressive themes contained within this media, and in particular, acts of verbal and physical aggression towards women. The latter trend is especially troubling, considering a large body of evidence linking pornography use to sexually coercive behaviors.

Over the last several decades, researchers have provided ample evidence using both experimental and survey methods, that pornography consumption is linked to sexually coercive behaviors. This relationship has been demonstrated in general population, adolescent, college, and offender populations, that include both men and women (Wright et al., 2016). Sprinkled throughout this body of work, is evidence regarding which aspects of pornography use seem to be driving this relationship. These include, but are not limited to, frequency of use (Bonino et al., 2006; Bouffard, 2010; Brown & L'Engle, 2009; Burton et al., 2011; Carr & VanDeusen, 2004; Chang et al., 2016; D'Abreu & Krahe, 2014; Kennair & Bendixen, 2012; Malamuth et al., 2000; Simons et al., 2012; Vega & Malamuth, 2007; Williams et al., 2009), type of pornography consumed (Demare et al., 1993; Gonsalves et al., 2015; Kingston et al.,

2008; Seto et al., 2010; Ybarra et al., 2011), sexual scripts adopted from pornography (Marshall et al., 2019; Tomaszewska & Krahe, 2016, 2018), age at first exposure (Mancini et al., 2012, 2014), number of modalities (Marshall et al., 2018, 2019, 2020), and compulsive use (Gonsalves et al., 2015). The final conclusion that can be derived from this literature, is the work that is still left for researchers. Namely, improving the methodologies used to measure pornography use and identifying when use becomes problematic.

After looking at recent systematic reviews synthesizing the last 20 years of pornography use research, it is evident that the methods used to measure pornography are almost entirely heterogeneous. The heterogeneity is present in both the conceptualization and operationalization of pornography consumption. Of most concern to the current study, is the operationalization, or the measurement, of pornography use. The reviews revealed that most relevant factors are not included in the majority of studies measuring pornography use. In fact, the variables that have garnered the most support in research are assessed in less than one-third of studies (i.e., type; Marshall & Miller, 2019). A potential reason for the heterogeneous methods used in the operationalization of pornography use, is the lack of a comprehensive, valid and reliable pornography use instrument.

Included in this review, was a comprehensive look at all of the existing measures of pornography consumption. While one of the measures discussed, the PCQ (Hald, 2006), provided a comprehensive measure of pornography use, the study lacked any psychometric evaluation, precluding researchers from having any confidence in whether they are measuring what they are intending to measure. Instruments that have undergone more psychometric evaluation, however, are limited in their scope. The CPUI (Grubbs et

al., 2010), PPUS (Kors et al., 2014), PCI (Reid et al., 2011), CPC (Noor et al., 2014), and ESMQ (Frable et al., 1997) have all undergone some form of reliability and validity examination, but are limited to measuring motivations of pornography use, or compulsive pornography consumption. These factors are important to measure, as researchers have implicated compulsivity in the relationship between pornography use and sexual coercion, yet there are a number of factors that are not included in these measures. Thus, what is needed is a valid, reliable, and comprehensive measure of pornography consumption that reflects modern use practices and all of the relevant correlates of sexual coercion.

The purpose of the current study is to provide a psychometric assessment of a set of 240 items designed to comprehensively measure pornography use. These items encompass all of the domains reviewed in this paper and were written for the purpose of inclusion in this instrument. The following hypotheses have been developed to drive the analyses:

H1: Factors related to type of pornography used, sexual scripts, compulsivity, and habits will be derived from the item pool.

H2: The items will demonstrate excellent internal and test-retest reliability

H3: Scores on the entire instrument and the individual factors will be significantly correlated with existing measures of related constructs.

H4: The scores on the entire instrument and the individual factors will be significantly correlated with self-reported sexual coercion.

H5: There will be identifiable thresholds in scores on the entire instrument and individual factors that are significantly correlated with self-reported sexual coercion.

In order to test these hypotheses, these items, as well as additional measures of hypersexuality, self-control, sensation seeking, rape myth acceptance, and pornography use, were given to a sample of college students in the Southern United States.

Additionally, the measure will be used in an analysis examining the relationship between these domains of pornography use and self-reported sexual coercion. Results of the analysis will provide a step forward in the movement towards more consistent, comprehensive, and effective measurement of a complex human behavior, which will aid researchers in understanding a relationship that has been heavily researched over the last several decades: the relationship between pornography use and sexual coercion.

CHAPTER III

Methods

Sample

The sample for the current study will consist of 524 men from a college in the Southern United States ($N = 274$) and respondents solicited from Amazon Mechanical Turk ($N = 250$). The average age for the sample was just under 29 years old, and the ethnic breakdown of the sample revealed that the majority of the respondents were White (53.8%), followed by Hispanic (18.7%), Black (15.1%), and those who identified as “other” (12.4%). As for sexual orientation, the majority of the sample identified as heterosexual (82.8%), followed by bisexual (15.5%), and lesbian/gay (1.7%). The overwhelming majority of the individuals in the sample had reported seeing pornography at some point in their life, either accidentally or intentionally, with 96% reporting some kind of exposure in their lifetime. Among these individuals, the largest portion of these described their first exposure as accidental (36.6%), followed by intentional (26.2%), being convinced by someone to watch the material (22.2%) or being forced or tricked into watching the material (14.9%). Finally, the average age at exposure to pornography was about the age of 15.

In addition, two smaller samples were collected from a rural college in the Southern United States. The first of these was a sample of 30 college students that was gathered to conduct a test-retest analysis. The average age was about 25 years old, and the majority of this sample identified as White (65.0%), followed by Hispanic (28.3%), and Black (6.7%). The second sample was a sample of 22 college students that was gathered to validate the faking good scale for the instrument (see the Measures section for

more details). The average age of this sample was about 24 years old, and the majority of these participants identified as White (65.2%), followed by Hispanic (17.4%), and Black (17.4%).

Procedure

The protocol used for the current study was developed and distributed entirely online. Respondents for this study were collected two ways. First, the student sample was gathered by soliciting participants enrolled in face-to-face and online undergraduate courses in a criminal justice department at a university in the Southern United States. The author provided instructors with a description of the research protocol, the purpose of the study, an informed consent form, and a link to the research protocol. After providing this information and materials to the instructor, the instructor shared this information with their students, who could then voluntarily choose to participate in the study. All but one faculty member who aided in soliciting participants offered extra credit to students to incentivize participation. This protocol was also used for the faking good and test-retest samples, with a few alterations for each.

For the faking good sample, along with giving student respondents the information sheet, they were informed that they were supposed to take the instrument as someone who is trying to hide the fact that they have a pornography use problem. This was explicitly outlined throughout the instruction document, to ensure that the students were made aware of this requirement. As for the test-retest sample, students were informed at the first instrument administration that they would be contacted in two weeks to complete the second administration of the instrument. They were also informed that, in order to obtain extra credit, they would have to complete both test administrations. The

test-retest and faking good samples were collected in the spring of 2020, and the main sample of college men was collected in the fall of 2019 and the fall of 2020. The second approach was through the use MTurk.

MTurk is a website that employs “workers” to complete various tasks, which include completing survey instruments. Research has shown support for the use of MTurk in gathering diverse behavioral research samples, particularly through replicating previous research results using samples gathered through MTurk (Paolacci, Chandler, & Ipeirotis, 2010; Suri & Watts, 2011). Additionally, more recent research has shown that data gathered through MTurk demonstrates temporal (Kim & Hodgins, 2017) and internal consistency (Miller et al., 2017). The same instructions that were provided to the student sample, were also provided to the MTurk sample, with a few additions. First, rather than providing extra credit, MTurk participants were offered \$2.50 in compensation for completing the “task.” Finally, in the instructions, it was made clear that the survey was intended for English-speaking participants. Because MTurk is an international program with “workers” around the world, it was necessary to provide this distinction. This sample was collected in the winter of 2020.

In order to comply with Institutional Review Board (IRB) policies, the participants were notified of the sensitive nature of the questions contained within the protocol, particularly involving sexuality, victimization, and criminal behavior. Additionally, participants were informed that their participation was not mandatory, and that if they did not wish to participate in the study, they were free to do so. Finally, participants were provided with contact information for counseling services, if any

participants were to experience trauma or triggering events during the course of the study. The average time required to complete the research protocol was about 30 minutes.

While there is some disagreement regarding the quality of data gathered online, researchers examining differences in responses to instruments assessing sexual behavior between face-to-face and online studies have found that there were not significant differences between these circumstances (Anderson et al., 2017). Thus, the ease of development, distribution, and exporting into programs for cleaning and analysis, the online approach was appropriate to use for the current study. As for the specific program, Qualtrics was used to design the research protocol, as well as to extract data for cleaning and examination. This program was selected as the engine through which to develop the protocol, due to the robust question, design, and distribution options contained within the program.

Measures

Pornography Use Instrument Items

Two hundred and forty items were written to assess the four domains identified in research as relevant to the relationship between pornography use and sexual aggression; type, sexual scripts, habits, and compulsive use. The items can be responded to on a Likert-type scale, with response options of (1) Never true of me, (2) Rarely true of me, (3) Sometimes true of me, and (4) Always true of me. As was evident in the review, researchers have not yet developed a comprehensive measure of pornography use, thus, the author of the current dissertation used a variety of approaches to ensure the content validity of the items contained with each domain. For instance, the author utilized operationalizations from previous studies that assessed habitual factors (Marshall et al.,

2018, 2019), sexual scripts (Simon & Gagnon, 1998; Tomaszewska & Krahe, 2016; 2018), and type (Foubert & Bridges, 2017). Additionally, some type items were developed using similar criteria used by Bridges and colleagues (2010) in their content analysis of physical and verbal aggression in pornography. This included behaviors ranging from pushing or shoving, to mutilation or attempted murder (Bridges et al., 2010). As for verbal aggression, this included name-calling and threatening physical harm (Bridges et al., 2010). Compulsive pornography use was developed through examining the previous domains of compulsive and addictive pornography use found in the literature (Grubbs et al., 2010; Korr et al., 2014; Reid et al., 2011). Furthermore, items assessing self-regulation and deviant fantasies contained within the compulsive use domain were created with the aid of a clinical psychologist with a history of assessing and treating individuals who experience these issues.

In addition to these four domains, validity scales will be developed from the item pool, in order to assess the respondent's response style to ensure that their completed protocol is valid. These will include a consistent responding scale and a faking good scale. Items for the consistent responding scale will be selected by identifying item pairs that are very highly correlated. For the faking good scale, items where a majority of respondents did not select the option "never true of me" (80% or more) will be chosen to comprise the scale. Individuals who are "faking good" should be able to be identified through low scores on this scale, providing additional information on the quality of responses. The faking good scale is especially important, considering the sensitive nature of the behaviors being assessed and the social desirability concerns that accompany the measurement of these concepts using self-report items.

Within the four domains, items were developed that assessed different content areas within the specific domain. For instance, type sub-domains included use of pornography containing children (19 items), aggression (20 items), humiliation (17 items), and consent (20 items). Sub-domains for sexual scripts included the three levels of scripts identified by Simon and Gagnon (1998), which included cultural (15 items), interpersonal (18 items), and intrapsychic (15 items) scripts. The habits domain was comprised of pornography use frequency (20 items), monetary investment (16 items), and history of use (2 items). Finally, the compulsive use domain contained maladaptive use (23 items), negative emotions (18 items), self-regulation (17 items), and deviant fantasies (20 items). Together, these items comprise an instrument containing 240 items, across four domains, and 14 sub-domains.

Finally, the reading level of the items was assessed through using a word-processing program, to ensure that the language of the instrument would be accessible to a wide range of populations. According the results of the analysis, the survey items yielded a Flesch Reading Ease score of 72.7 and a Flesch-Kincaid Reading Level of 6, indicating that individuals with a sixth grade level of education would be able to read and understand the items with ease.

Validation Measures

In order to assess the validity of the items, a number of instruments were included in the assessment that examined the following areas: hypersexuality, self-control, sensation seeking, rape myth acceptance, pornography use, and sexual coercion perpetration. Additionally, the descriptive statistics for each of these instruments can be found in Table 2.

Hypersexual Behavior Inventory. The HBI (Reid et al., 2011) consists of 19 items across three factors, which are Consequences, Control, and Coping. Examples of items include: “My sexual behavior controls my life,” “Sexually, I behave in ways I think are wrong,” and “Doing something sexual helps me feel less lonely.” Response options to all of the items on the instrument include: (1) Never, (2) Rarely, (3) Sometimes, (4) Often, and (5) Very Often. The instrument was initially developed in a sample of hypersexual men, and demonstrated strong reliability and validity. Specifically, Cronbach’s alpha for the entire instrument was excellent ($\alpha = .96$), as well as for the individual scales within the instrument ($\alpha = .90 - .95$). Concurrent validity was demonstrated through strong correlations of the entire instrument score with existing measures of hypersexuality (Reid et al., 2011), such as the Sexual Compulsivity Scale (SCS; $r = .82$) and the Compulsive Sexual Behavior Inventory (CSBI; $r = .75$).

The instrument has since been tested in non-clinical student and general population samples of men and women across several nations, and has demonstrated strong reliability and validity (Ballester-Arnal et al., 2019; Both et al., 2019; Rettenberger et al., 2016). For instance, Ballester-Arnal and colleagues (2019) examined the reliability and validity of the HBI in a sample of general population men and women. Cronbach’s alpha for the entire instrument, as well as the individual scales, showed that the HBI demonstrated excellent item consistency ($\alpha = .93 - .96$). Furthermore, Ballester-Arnal and colleagues (2019) indicated that the instrument demonstrated excellent test-retest reliability ($r = .77$). Much like Reid and colleagues (2011a), concurrent validity was demonstrated through strong correlations to the SCS ($r = .74$), as well as strong correlations with the Sexual Addiction Screening Test (SAST; $r = .72$) and the Internet

Sex Screening Test (ISST; $r = .51$). Additionally, researchers have adapted the instrument into Spanish (Ballester-Arnal et al., 2019) and German (Retternberger et al., 2016), and found that the same three factors found in the initial studies emerged, supporting the initial 19-item, three-factor structures demonstrated by Reid and colleagues (2011a).

Grasmick Self-Control Scale. The 24 Likert-type items included in the Grasmick assess six different characteristics of self-control, which include impulsivity, insensitivity, risk taking, temper control, a preference for easy and simple tasks, and a preference for physical tasks over mental tasks (Grasmick et al., 1993). Items included in the measure include: “I often act on the spur of the moment without taking time to think,” and “I lose my temper pretty easily.” Response options for each item include: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree. Among criminal justice and criminology researchers, the Grasmick is one of the most commonly used assessment of self-control, though many debate whether the instrument is multi-dimensional or unidimensional (see Higgins, 2007; Piquero & Rosay, 1998). Though this debate is still ongoing, the scale has received considerable support in research as a valid and reliable measure of the concept of self-control (Nagin & Paternoster, 1993; Piquero & Tibbets, 1996; Piquero & Rosay, 1998).

Researchers have consistently found good reliability in samples of college men and women, such as a recent study conducted by Marshall and colleagues ($\alpha = .87$ for men and $\alpha = .85$ for women; 2020). This mirrors findings from earlier work, indicating that Cronbach’s alpha for the scale consistently demonstrates good internal reliability ($\alpha = .83 - .89$; Arneklev, 1998). Finally, validity has been demonstrated through the relationship between self-control as measured by the Grasmick and criminal, or otherwise

“analogous” behaviors. A meta-analysis by Pratt and Cullen (2000) gathered 41 studies using the Grasmick and found that the overall effect size was significant ($r = .26$).

Additionally, some evidence for validity was found for the “risk-seeking” scale on the Grasmick, through significant correlations between scores on this subscale and a measure of self-reported sexually coercive behaviors (Bouffard & Miller, 2014).

Brief Sensation-Seeking Scale. This eight-item instrument was designed to be a brief instrument used to assess sensation seeking among young adults, yet still maintain the four primary dimensions of sensation seeking outlined by researchers and practitioners (Hoyle et al., 2002), which are experience seeking, boredom susceptibility, thrill and adventure seeking, and disinhibition. Using a sample of over 7,000 young adults, the authors found that their instrument demonstrated reliability and validity across ethnicity, age, and gender (Hoyle et al., 2002). In particular, Cronbach’s alpha for the instrument indicated good reliability ($\alpha = .76$). Studies following the initial development have provided more evidence of internal reliability across cultures, with excellent reliability demonstrated in China ($\alpha = .90$; Chen et al., 2013) and India ($\alpha = .90$; Bhat et al., 2019). Validity for the instrument has been demonstrated through the instrument’s correlation with drug and alcohol use, as well as other measures of sensation seeking (Bhat et al., 2019; Chen et al., 2013; Hoyle et al., 2002). In the initial study, the authors found that scores on the BSSS were significantly correlated with tobacco ($r = .37$), marijuana ($r = .49$), and alcohol use ($r = .38$) in young adults. Chen and colleagues (2013) also found support for validity in the BSSS through identifying significant relationships between higher scores on the BSSS, and increased alcohol use, tobacco use, and engagement in risky sexual behaviors.

Rape Myth Acceptance Scale. This 19-item instrument contains statements that encompass common rape myth acceptance, such as “Many rapes happen because women lead men on,” “In some rape cases, the woman actually wanted it to happen,” and “When women talk and act sexy, they are inviting rape” (Lonsway & Fitzgerald, 1995). Each of the items can be responded to on a Likert scale including: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree. The authors of the instrument demonstrated strong evidence for reliability and validity in their initial study. In particular, Cronbach’s alpha for the instrument demonstrated good internal reliability ($\alpha = .89$), and the authors found support for validity through significant correlations between the instrument and measures of adversarial sexual beliefs ($r = .61$), attitudes towards violence ($r = .48$), and acceptance of interpersonal violence ($r = .66$). More recent studies have provided additional evidence of reliability in college samples, with Marshall and colleagues (2018) providing evidence of excellent reliability ($\alpha = .91$) in a sample of college males, and Bouffard and Miller (2014) giving evidence of good reliability ($\alpha = .87$) in a sample of college females. Additionally, both studies found significant correlations between increased scores on the Rape Myth Acceptance scale and measures of self-reported sexual coercion ($r = .23$; Bouffard & Miller, 2014), and increased scores on a measure of intent to engage in sexually coercive behavior ($r = .29$; Marshall et al., 2020).

Pornography Consumption Inventory (PCI). The PCI was developed by Reid and colleagues (2011) to assess an individual’s motivation for their pornography use. These motivations included emotional avoidance, sexual curiosity, excitement seeking, and sexual pleasure. Examples of items on the instrument include “I use pornography to learn about a sexual activity or practice,” “I use it to avoid uncomfortable or unpleasant

emotions,” and “I use it to feel sexual pleasure” (Reid et al., 2011). Response options to the Likert-type items include: (1) Never like me, (2) Rarely like me, (3) Sometimes like me, (4) Often like me, and (5) Very often like me. The initial study yielded strong support for the reliability and validity of the instrument (Reid et al., 2011), with good Cronbach’s Alpha values ($\alpha = .83$) and test-retest reliability, and concurrent reliability was demonstrated through significant correlations between scores on the PCI, and measures of hypersexuality and personality traits. Beyond this initial study, researchers have found support for this instrument in samples of college students and general population men and women (Baltieri, Aguiar, et al., 2015; Baltieri, Gatti, et al., 2015a ; Baltieri, Oliveira, et al., 2015).

Sexual Experiences Survey-Short Form Perpetration (SES-SFP). The SES-SFP (Koss et al., 2007) contains four types of sexual behaviors, which are “I fondled, kissed, or rubbed up against the private areas of my body (lips, breast/chest, crotch, butt) or removed some of their clothes without their consent,” “I had oral sex with someone or had someone perform oral sex on me without their consent,” “I put my penis (men only) or I put my fingers or objects (all respondents) into a women’s vagina without her consent,” and “I put my penis (men only) or I put my fingers or objects (all respondents) into someone’s butt without their consent.” Each sexual behavior has five different tactics that can be used to obtain the sexual act, which include telling lies or threatening to end the relationship, verbally attacking the individual, taking advantage of an incapacitated state (i.e., drug or alcohol use), threatening physical harm to them or someone close to them, and using physical force. Finally, respondents are asked the number of times they

had engaged in this behavior in the past 12 months, and how many times they had engaged in the behavior since the age of 14. This resulted in 20 total items.

Since the instrument's development in 2007, a number of studies have assessed the reliability and validity of the instrument. Johnson and colleagues (2017) used a sample of 569 college men and women and found that the SES-SFP demonstrated strong internal reliability among men and women ($\alpha = .98 - .99$), test-retest reliability, and predictive validity. For test-retest reliability, the authors reported a 91% match in responses over a two-week period among men and women in the sample. Validity was demonstrated through significant relationships found between high scores on the SES-SFP and measures of rape myth acceptance ($p < .008$) and hyper-gender ideology ($p < .008$). Similar findings have been demonstrated in other studies (Anderson et al., 2017; Kuo et al., 2019), indicating that the SES-SFP is an appropriate measure of sexually coercive behaviors. In particular, Anderson and colleagues (2017) used an alternative measure of internal reliability, Spearman's rho, and found that frequency scores within categories of behavior were highly correlated ($\rho = .67$), demonstrating good evidence for internal reliability. Additionally, the authors mirrored previous researcher's findings regarding test-retest reliability, with a 90% agreement between testing at two time points. Finally, for validity, Anderson and colleagues (2017) found moderately strong correlations ($r = .31$) between scores on the SES-SFP and the Sexual Coercion subscale of the Conflict Tactics Scale (CTS2).

Table 2*Descriptives and Internal Consistency of Validity Scales*

	Mean (SD)	Range	Cronbach's Alpha
HBI	47.69 (23.56)	19 – 95	0.98
Grasmick	2.40 (0.68)	1 – 4	0.95
BSSS	2.56 (0.75)	1 - 4	0.89
RMA	2.03 (0.88)	15 – 60	0.97
PCI	42.05 (16.87)	15 – 60	0.96
SES-SFP	55.99 (22.787)	40 - 120	0.88-0.92

Note. $N = 482$. BSSS = Brief Sensation Seeking Survey; HBI = Hypersexual Behavioral Inventory; PCI = Pornography Consumption Inventory; RMA = Rape Myth Acceptance; SES-SFP = Sexual Experiences Survey-Short Form Perpetration.

^aFor SES-SFP, Spearman's Rho was used as an assessment of internal reliability. The range of correlations across coercion tactics is included in the table (see Anderson et al., 2017).

Analysis Plan***Item Selection***

The first step in the analysis plan was to run a confirmatory factor analysis (CFA). This determined whether the items loaded onto the predicted latent factors of pornography use. In line with recommendations made by previous researchers (Hair et al., 2018), the cut-off of .50 for factor loadings was chosen to decide which items would be included on the factors. Any items falling below this cut-off were excluded from the instrument in subsequent analyses. Finally, because of the ordinal nature of the individual items on the instrument, the mean- and variance- adjusted weighted least squares estimator (WLSMV; Finney & DiStefano, 2006) was selected.

As for the validity scales, two approaches were used to select items for the consistent responding scale and faking good scale. The consistent responding scale was

developed through locating highly correlated and similarly-worded item pairs from the item pool that remained after the CFA. Once the item-pairs were selected, the scores from the sample were compared to a sample of randomly generated responses, in order to examine if significant differences could be detected for the scores on this scale. For the faking good scale, a small sample of respondents were instructed to take the instrument as someone who is trying to hide the fact they have a pornography use problem. The total score of the faking good scale for the main sample was then compared to the smaller faking good sample, in order to examine if significant differences could be detected.

Reliability

Once the factors were developed from the confirmatory factor analysis, and items that did not load on to any factors were removed, several analyses were conducted to assess reliability. First, each factor was assessed for internal consistency using Cronbach's alpha. Additionally, test-retest reliability for each factor, and the entire instrument, was assessed. This was accomplished by examining Pearson's correlation coefficients between responses to the items completed within a two-week period using the smaller test-retest sample, and a paired sample t-test.

Validity

In order to assess the validity of the instrument, a correlation matrix for each factor, as well as the entire instrument, was run to assess whether there is evidence for convergent validity. Additionally, convergent and concurrent validity was assessed with a correlation matrix containing a previously established measure of compulsive pornography use, as well as measures of hypersexuality, self-control, sensation-seeking, rape myth acceptance, and self-reported sexual coercion. Finally, Receiver Operating

Characteristic (ROC) analyses were conducted using a dichotomized version of the measure of self-reported sexual coercion¹, to examine predictive validity and analyze whether there are significant thresholds on the entire instrument, as well as the individual factors, that significantly predict self-reported sexual coercion.

¹ The dichotomous variable was computed by coding individuals who endorsed items indicating that they had engaged in using threats of physical aggression, drugs/alcohol, or physical force to engage in fondling or penetrative (e.g., oral, vaginal, anal) sexual acts as a one, and those who did not endorse those items, as a zero.

CHAPTER IV

Results

Confirmatory Factor Analysis

The first analysis for the current study involved running a confirmatory factor analysis (CFA) to test the proposed factor structure of the 240 items developed for use with the problematic pornography use instrument. The proposed model can be found in Figure 1.

In the model, it was proposed that all of the items developed to assess specific sub-domains would represent that sub-domain as a latent construct. Habits and sexual scripts were labelled as their own latent constructs. For the sub-domain of type, four latent constructs were proposed, which consisted of aggression, child, humiliation, and consent. Finally, four latent constructs were proposed for the items assessing compulsive pornography use, which were negative emotions, maladaptive use, deviant fantasies, and self-regulation. Due to the ordinal nature of the Likert-type items, item responses were treated as categorical indicators. Because of this, the appropriate estimator for the analysis was the mean- and variance- adjusted weighted least squares estimator (WLSMV; Finney & DiStefano, 2006).

Prior to assessing model fit, items that were found to have factor loadings below .50² were removed from the initial model. This resulted in the removal of 11 items from the habits factor and 13 items from the sexual script factor. As for the compulsive use factors, 7 items were removed from the negative emotions factor, 7 items from the

² Recommendations on factor loadings typically fall anywhere from .20-.70 (Matsunaga, 2010). Rather than favoring a more conservative or liberal estimate, based on the recommendations of Hair and colleagues (2018), a cutoff of .50 for factor loadings was used.

maladaptive use factor, 5 items from the deviant fantasies factor, and 11 items from the self-regulation factor. Finally, for the type factors, 4 items were removed from the aggressive type factor, 5 from the child type factor, 3 from the consent type, and 1 from the humiliation type. After removing these items, 170 of the 240 items were included in the model.

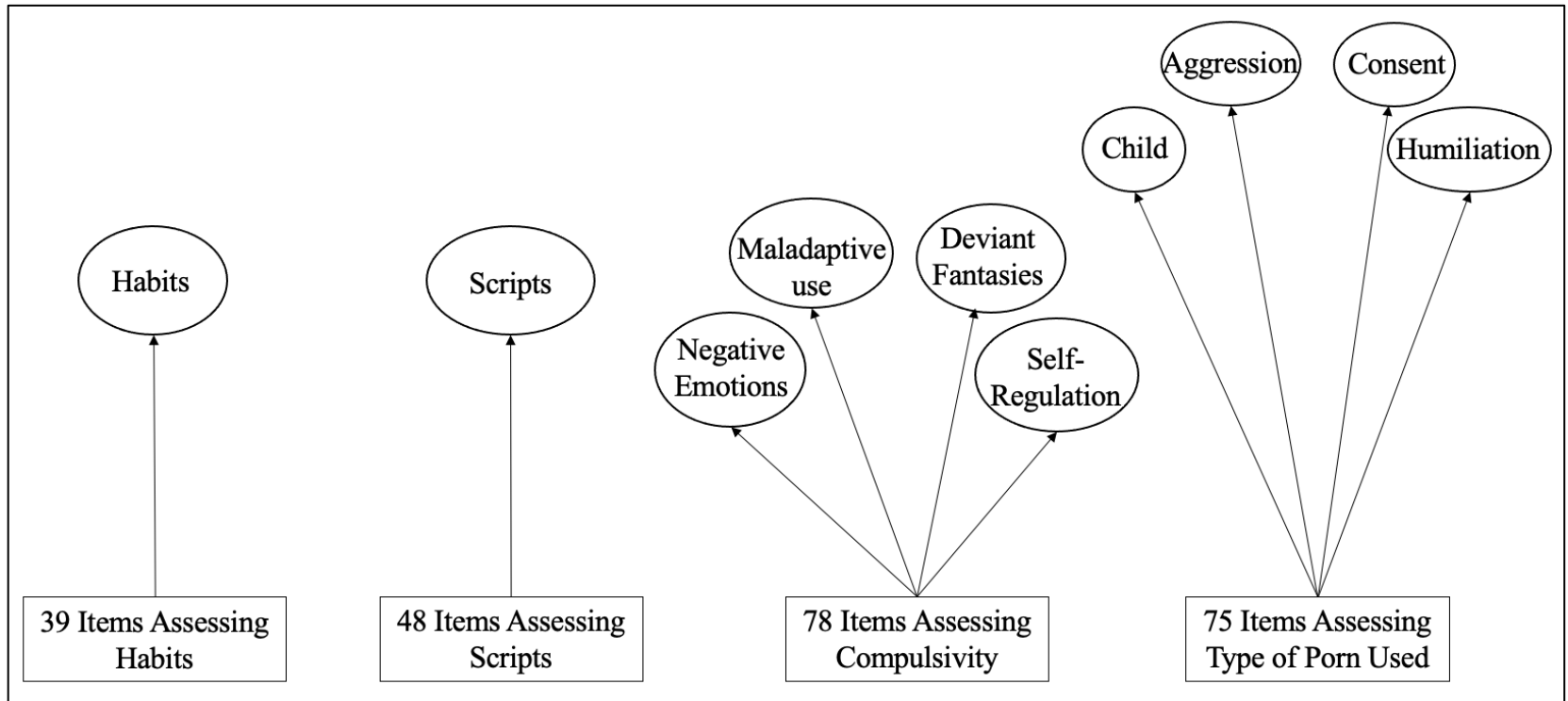


Figure 1

Proposed confirmatory factor analysis model for the initial 240 items

The initial test of model fit after removing items with factor loadings below .50 yielded a model with mixed support. The root mean square error of approximation (RMSEA) statistic indicated the model was an excellent fit (RMSEA = .042), however, the comparative fit index (CFI) indicated the model did not fit the data well (CFI < .90). Model modification indices were referenced in order to improve the model fit. The results of the final model can be found in Figure 2.

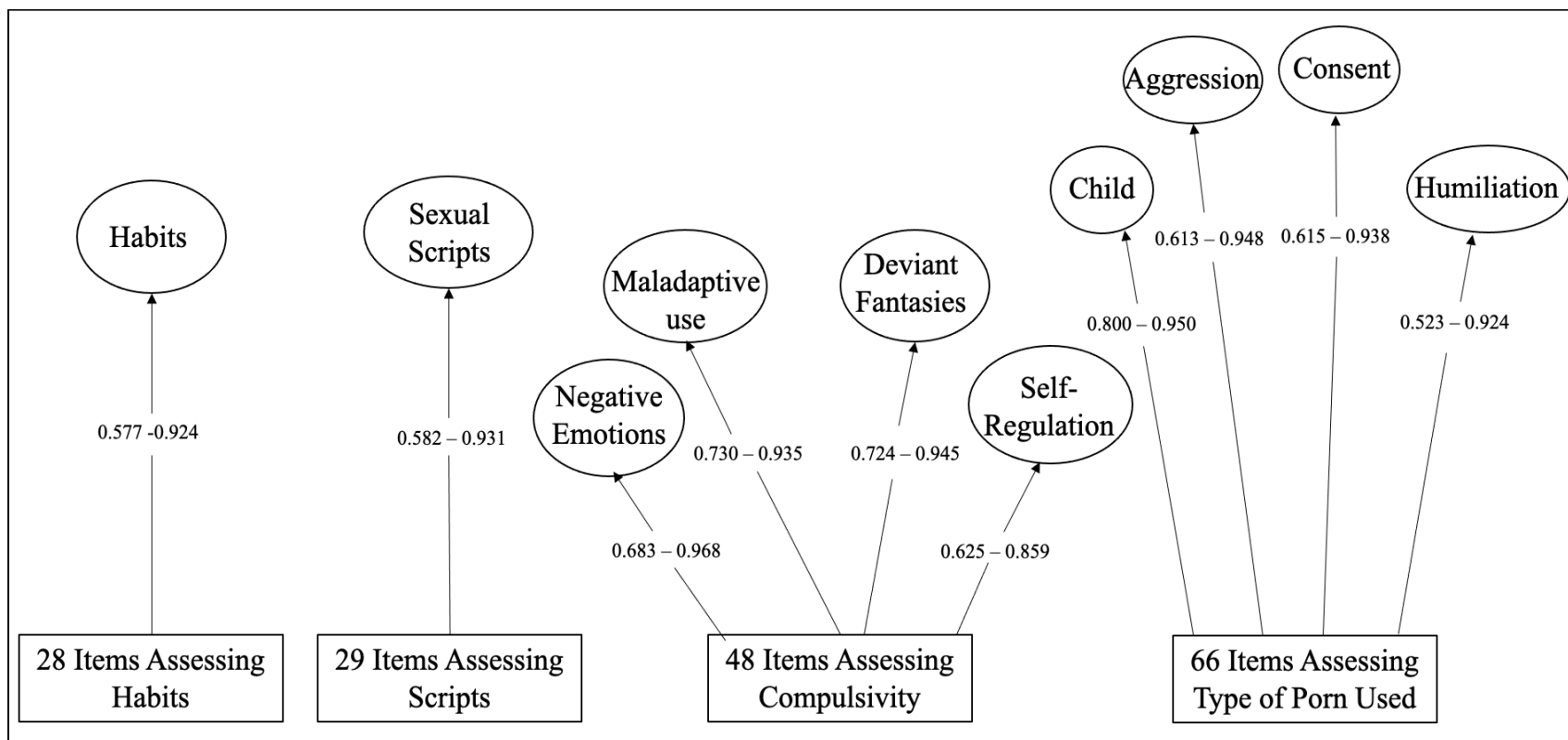


Figure 2

Final Structural Equation Model

Note: $N = 524$. Standardized factor loadings are shown. All paths shown are significant ($p < .01$). $\chi^2 = 20,371.29$, $p < .01$; CFI = .98; RMSEA = 0.02. CFI = comparative fit index; RMSEA = root mean square error of approximation

Fit statistics for the final model indicated that the model was an excellent fit to the data. Particularly, both the CFI and RMSEA all indicated that the model was an excellent fit to the data. While the chi-square test of model fit was significant, this was expected due to the large sample size, in addition to the high correlations between factors, the higher number of factors, and item response categories amounting to greater than three categories (Beaudecel & Herzberg, 2006). Changes to the model after consulting the model modification indices were as follows. First, model modification indices suggested moving an item designed to assess scripts to the aggressive type factor. The item in question was written to assess acting aggressively towards a partner after viewing aggressive pornography. Similarly, model modification indices suggested moving an item designed to assess scripts to the habits factor. The content of this particular item involved pornography use creating issues in interpersonal relationships. Since the content of both of these items aligned with the suggestions provided in the modification indices, the model was altered to place these script items under the aggressive type and habits factors. Finally, one item developed for the negative emotion factor was highlighted as being a better fit for the maladaptive use factor. Once again, the content of this item aligned with the suggestion provided in the modification indices, so this item was moved to the maladaptive use factor.

Finally, model fit indices suggested covarying nine item pairs from the final 170 items. Three item pairs came from the scripts factor, two item pairs came from the habits factor, and one item pair came from the deviant fantasies, negative emotions, aggressive type, and humiliation type factors. All covarying item pairs came from within the same factor, and the similar content of the items supported covarying these items in the model.

After these final adjustments to the model were made, the final model contained 170 items across ten factors assessing habits, scripts, negative emotions, maladaptive use, deviant fantasies, self-regulation, use of aggressive pornography, use of child pornography, use of pornography containing a lack of consent, and use of pornography containing humiliation. Factor loadings for habits domain can be found in Table 3, factor loadings for scripts can be found in Table 4, factor loadings for compulsive use factors can be found in Table 5, and factor loadings for type factors can be found in Table 6.

Table 3

Habits Domain Item Descriptives and Factor Loadings

Items	Item description	M(SD)	Standardized factor loading (SE)
Habits2	Paid magazine subscriptions	1.79 (1.04)	0.84 (0.02)
Habits3	Embarrassed by frequency	2.37 (1.07)	0.57 (0.03)
Habits4	Storing on smartphone	2.15 (1.09)	0.65 (0.02)
Habits6	Daily porn use	2.40 (1.04)	0.65 (0.02)
Habits7	Use away from home	2.21 (1.05)	0.71 (0.02)
Habits9	Lost track of time during use	2.22 (1.05)	0.73 (0.02)
Habits10	Duration of use	2.04 (1.05)	0.83 (0.01)
Habits11	Use several times a day	2.12 (1.03)	0.83 (0.01)
Habits13	Use at work/school	1.80 (1.06)	0.92 (0.01)
Habits14	Use several times a day	2.22 (1.02)	0.77 (0.02)
Habits16	Regular use after first exposure	2.45 (1.05)	0.65 (0.02)
Habits19	Trading materials with others	1.82 (1.04)	0.92 (0.01)
Habits20	Ashamed of frequency	2.29 (1.10)	0.66 (0.02)
Habits21	Shared material on websites	1.91 (1.05)	0.84 (0.01)

(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Habits22	Unpaid website membership	1.95 (1.12)	0.85 (0.01)
Habits23	Kept magazines at home	1.95 (1.08)	0.76 (0.02)
Habits24	Visited adult movie theatres	1.86 (1.06)	0.89 (0.01)
Habits25	Stayed in for planned use	1.97 (1.04)	0.87 (0.01)
Habits26	Ordering movies in hotels	1.80 (1.05)	0.93 (0.01)
Habits27	Kept films at home	2.01 (1.11)	0.81 (0.01)
Habits28	Purchased films at adult stores	1.80 (1.03)	0.89 (0.01)
Habits30	Use several times a week	2.48 (1.06)	0.58 (0.03)
Habits31	Bring materials on trips	1.90 (1.09)	0.89 (0.01)
Habits33	Sharing through shareware	1.83 (1.02)	0.88 (0.01)
Habits36	Exposure before masturbation	2.31 (1.15)	0.64 (0.02)
Habits38	Made plans around use	2.06 (1.06)	0.85 (0.01)
Habits39	Involvement in forums	1.87 (1.08)	0.91 (0.01)
Script29	Lost relationships because use	1.83 (1.06)	0.92 (0.01)

Table 4*Script Domain Item Descriptives and Factor Loadings*

Items	Item description	M(SD)	Standardized factor loading (SE)
Script1	Sexual knowledge from use	2.32 (1.01)	0.61 (0.03)
Script2	How to treat others sexually	2.02 (1.07)	0.81 (0.02)
Script6	People who resist really want it	1.95 (1.05)	0.85 (0.01)
Script7	Understand sexual situations	2.25 (1.03)	0.75 (0.02)
Script9	People enjoy acts in porn	2.30 (1.02)	0.73 (0.02)
Script11	Interest in oral after exposure	2.41 (1.01)	0.63 (0.02)
Script12	Interest in anal after exposure	2.32 (1.09)	0.72 (0.02)

(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Script13	Interest in oral after exposure	2.48 (1.03)	0.65 (0.02)
Script14	People need porn to learn sex	2.12 (1.03)	0.82 (0.01)
Script15	Porn helped discover sexuality	2.35 (1.08)	0.77 (0.02)
Script16	Show partner porn for activities	1.92 (1.07)	0.93 (0.01)
Script19	Fantasized about anal after porn	2.26 (1.09)	0.75 (0.02)
Script21	People are easy like in porn	1.95 (1.06)	0.91 (0.01)
Script22	Control sex life of relationship	2.47 (1.00)	0.58 (0.03)
Script23	See others differently after porn	2.07 (1.00)	0.84 (0.01)
Script25	Tried oral after porn	2.24 (1.09)	0.78 (0.02)
Script26	Interest in teens after porn	1.93 (1.06)	0.91 (0.01)
Script28	Porn helps me understand sex	2.17 (1.07)	0.85 (0.01)
Script30	Porn changed sexual thinking	2.26 (1.04)	0.81 (0.01)
Script32	Porn can teach you to be better	2.36 (1.03)	0.75 (0.02)
Script33	Used porn to learn about sex	2.31 (1.05)	0.75 (0.02)
Script34	Porn taught me what I want	2.28 (1.00)	0.74 (0.02)
Script36	Tried to be rough after porn	2.04 (1.07)	0.85 (0.01)
Script38	Porn is a part of growing up	2.39 (1.02)	0.65 (0.02)
Script39	Control sex life of relationships	2.50 (1.02)	0.60 (0.03)
Script41	Porn showed me what I want	2.40 (1.03)	0.80 (0.01)
Script42	Porn teaches you what you want	2.35 (1.01)	0.76 (0.02)
Script44	Did things different after porn	2.32 (1.02)	0.72 (0.02)
Script47	Everyone learns from porn	2.36 (1.01)	0.74 (0.02)

Table 5*Compulsive Use Domain Item Descriptives and Factor Loadings*

Items	Item description	M(SD)	Standardized factor loading (SE)
Negative emotions			
Neg1	Feeling shame after use	2.43 (1.09)	0.68 (0.03)
Neg3	Feel bad about self after use	2.39 (1.04)	0.78 (0.02)
Neg4	Believe it is morally wrong to use	2.32 (1.11)	0.73 (0.03)
Neg5	Feeling shame after use	2.36 (1.07)	0.83 (0.02)
Neg6	Feel dirty after use	2.36 (1.09)	0.81 (0.02)
Neg9	Feel guilty even if single	2.28 (1.08)	0.83 (0.02)
Neg10	Feel like I did something bad	2.26 (1.11)	0.91 (0.02)
Neg12	Feel worthless after use	2.18 (1.09)	0.96 (0.02)
Neg14	Still use it even if I feel bad after	2.39 (1.09)	0.88 (0.03)
Neg15	Feel empty after use	2.28 (1.10)	0.95 (0.02)
Maladaptive use			
Mala1	Told I am addicted to internet	2.29 (1.04)	0.73 (0.02)
Mala3	Use porn to avoid problems	2.03 (1.04)	0.86 (0.01)
Mala4	Use porn to avoid bad thoughts	2.03 (1.03)	0.86 (0.01)
Mala6	Use porn to avoid problems	2.03 (1.03)	0.85 (0.01)
Mala8	Use porn to relieve stress	2.04 (0.99)	0.85 (0.01)
Mala9	Use porn to escape problems	2.16 (1.02)	0.83 (0.01)
Mala10	Use porn on a bad day	2.13 (1.02)	0.87 (0.01)
Mala11	Porn to distract bad feelings	2.06 (1.04)	0.85 (0.01)
Mala12	Use porn to avoid problems	2.05 (1.04)	0.86 (0.01)
Mala15	Use porn to escape problems	2.13 (1.04)	0.87 (0.01)
Mala16	Stress relief from porn use	2.13 (1.05)	0.87 (0.01)
			(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Mala17	Feel like I am addicted to porn	2.05 (1.06)	0.86 (0.01)
Mala18	Need porn to relax	1.95 (1.08)	0.92 (0.01)
Mala19	Porn to distract from problems	2.08 (1.04)	0.87 (0.01)
Mala20	Tried to quit porn, but cannot	2.20 (1.06)	0.78 (0.02)
Mala21	Used porn to avoid partner	1.94 (1.05)	0.93 (0.01)
Mala22	Porn use to forget about problem	2.15 (1.05)	0.82 (0.01)
Mala23	Porn to escape negative thoughts	2.02 (1.04)	0.88 (0.01)
Neg7	Stress relief from porn use	2.72 (0.97)	0.74 (0.02)
Deviant fantasies			
Dev2	Some fantasies I have upset me	2.07 (1.07)	0.80 (0.01)
Dev3	Fantasize about unusual things	2.23 (0.99)	0.73 (0.02)
Dev5	Fantasize about hurting others	1.92 (1.05)	0.82 (0.01)
Dev6	Use fantasy to address bad feelings	2.06 (1.01)	0.85 (0.01)
Dev7	Think about sex more than others	2.28 (1.06)	0.72 (0.02)
Dev8	Think about acting fantasies out	2.29 (1.01)	0.73 (0.02)
Dev10	Fantasized about sex with kids	1.80 (1.06)	0.94 (0.01)
Dev14	Fantasies about doing bad things	2.15 (1.09)	0.80 (0.01)
Dev15	Fantasies about underage people	1.88 (1.07)	0.92 (0.01)
Self-regulation			
Slfreg1	Get upset too easy	2.18 (0.93)	0.62 (0.03)
Slfreg6	Wish I had more self-control	2.41 (1.06)	0.69 (0.02)
Slfreg7	Frustrated if I don't get my way	2.48 (0.94)	0.70 (0.02)
Slfreg10	I hear I need more self-control	2.02 (0.98)	0.87 (0.01)
Slfreg11	I think about things I shouldn't	2.40 (1.03)	0.69 (0.02)
Slfreg12	Choose fun over responsibilities	2.49 (0.93)	0.69 (0.02)
Slfreg13	Do bad things for fun	2.24 (1.01)	0.82 (0.01)

(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Slfreg19	Difficulty with behavior if upset	2.15 (1.03)	0.85 (0.01)
Slfreg20	Trouble controlling temper	2.09 (1.01)	0.85 (0.01)

Table 6*Type of Pornography Used Item Descriptives and Factor Loadings*

Items	Item description	M(SD)	Standardized factor loading (SE)
Aggression			
Tpagg1	Pushing/shoving	2.24 (0.99)	0.73 (0.02)
Tpagg4	Spanking	2.51 (0.97)	0.61 (0.03)
Tpagg5	Forced gagging	2.44 (0.98)	0.64 (0.02)
Tpagg6	Choking	2.36 (1.04)	0.73 (0.02)
Tpagg7	Pinching	1.98 (1.04)	0.86 (0.01)
Tpagg8	Individual bruising from injury	2.01 (1.04)	0.86 (0.01)
Tpagg9	Individual bleeding from injury	1.82 (1.04)	0.93 (0.01)
Tpagg10	Kicking	1.85 (1.07)	0.93 (0.00)
Tpagg11	Individual getting broken bone	1.83 (1.06)	0.94 (0.01)
Tpagg13	Bleeding from penetration	1.89 (1.10)	0.92 (0.01)
Tpagg14	Depictions of gang-rape	2.22 (1.04)	0.74 (0.02)
Tpagg16	Scratching	2.03 (1.06)	0.85 (0.01)
Tpagg17	Slapping	2.16 (1.03)	0.82 (0.01)
Tpagg18	Biting	2.04 (1.06)	0.85 (0.01)
Tpagg19	Striking with objects	1.90 (1.06)	0.94 (0.00)
Tpagg20	Verbal insults	2.29 (1.01)	0.73 (0.02)
Tpagg21	Penetration with foreign objects	2.25 (1.07)	0.75 (0.02)
Script8	Urge to inflict pain after use	1.87 (1.04)	0.88 (0.01)

(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Child			
Tpchd2	Physical abuse of male teens	1.82 (1.06)	0.90 (0.01)
Tpchd4	Porn with undeveloped females	1.87 (1.07)	0.92 (0.01)
Tpchd6	Porn could be called child porn	1.83 (1.10)	0.92 (0.01)
Tpchd7	Coercion of underage females	1.81 (1.04)	0.93 (0.01)
Tpchd8	Coercion of prepubescent males	1.76 (1.04)	0.92 (0.01)
Tpchd10	Porn with prepubescent males	1.75 (1.06)	0.95 (0.00)
Tpchd11	Physical abuse of teen females	1.77 (1.04)	0.94 (0.00)
Tpchd12	Females made to look young	2.22 (1.05)	0.80 (0.01)
Tpchd13	Porn with young teen males	1.77 (1.05)	0.93 (0.01)
Tpchd14	Porn with undeveloped females	1.85 (1.08)	0.93 (0.00)
Tpchd15	Porn with child-like female	1.84 (1.04)	0.92 (0.01)
Tpchd16	Physical abuse of female child	1.75 (1.06)	0.93 (0.00)
Tpchd17	Coercion of teenage females	1.81 (1.09)	0.93 (0.00)
Tpchd18	Abuse of prepubescent males	1.73 (1.02)	0.91 (0.01)
Tpchd20	Coercion of teenage males	1.83 (1.07)	0.91 (0.01)
Consent			
Tpcon1	Boss convinced an employee	2.34 (1.05)	0.61 (0.03)
Tpcon2	Someone is tricked into sex	2.29 (1.03)	0.72 (0.02)
Tpcon3	Sex with someone who is drunk	1.92 (1.03)	0.90 (0.01)
Tpcon5	Sex with person who is drugged	1.88 (1.07)	0.93 (0.01)
Tpcon7	Non-consensual genital exposure	2.02 (1.04)	0.89 (0.01)
Tpcon8	Use of physical force to have sex	1.94 (1.05)	0.91 (0.01)
Tpcon9	Internal ejaculation no consent	2.11 (1.07)	0.78 (0.02)
Tpcon10	Depiction of non-consensual sex	2.06 (1.05)	0.88 (0.01)
Tpcon11	Sex filmed without consent	2.02 (1.09)	0.89 (0.01)

(continued)

Items	Item description	M(SD)	Standardized factor loading (SE)
Tpcon12	Verbal threats to obtain sex	1.90 (1.06)	0.92 (0.01)
Tpcon13	Gifts used to obtain sex	2.13 (1.05)	0.82 (0.01)
Tpcon14	Family member uses coercion	2.13 (1.04)	0.79 (0.01)
Tpcon16	Money used to obtain sex	2.21 (1.03)	0.79 (0.02)
Tpcon17	Services offered to obtain sex	2.26 (1.00)	0.79 (0.01)
Tpcon18	Life threatened to obtain sex	1.90 (1.10)	0.93 (0.01)
Tpcon19	Told a lie to obtain sex	2.06 (1.04)	0.87 (0.01)
Tpcon20	Teacher convinced a student	2.28 (0.99)	0.79 (0.01)
Humiliation			
Tphum1	Wearing a dog leash	2.20 (1.04)	0.90 (0.01)
Tphum2	Ejaculation on face of actor	1.93 (1.10)	0.82 (0.01)
Tphum3	Many men ejaculating on actor	2.30 (1.04)	0.75 (0.02)
Tphum4	Individual is tied up	2.24 (0.99)	0.76 (0.02)
Tphum5	Someone is spat on	2.05 (1.04)	0.83 (0.01)
Tphum6	Tried bondage after seeing porn	1.92 (1.03)	0.84 (0.01)
Tphum7	Individuals wear painful device	1.94 (1.03)	0.91 (0.01)
Tphum8	Individuals wear ball gags	1.97 (1.06)	0.89 (0.01)
Tphum9	Porn containing domination	2.21 (1.02)	0.80 (0.01)
Tphum10	Wearing handcuffs	2.16 (1.05)	0.83 (0.01)
Tphum11	Someone urinates on another	2.01 (1.09)	0.86 (0.01)
Tphum12	Someone is held captive	1.93 (1.06)	0.92 (0.01)
Tphum13	Hot wax is poured on someone	1.96 (1.08)	0.88 (0.01)
Tphum15	Ejaculation on face of actor	2.67 (0.95)	0.52 (0.03)
Tphum16	People are insulted	2.14 (1.04)	0.83 (0.01)
Tphum17	Contains bondage activities	2.09 (1.05)	0.87 (0.01)

Validity Scale Development

Items for the consistent response scale were selected by examining the correlations between 10 pairs of similarly worded items. After selecting the items, correlations were examined between the item pairs, and the results revealed that all of the pairs demonstrated high item intercorrelations ($r > .60$). The consistent response scale was then calculated for these item pairs using the absolute difference between the items within the 10 pairs.

Following the calculation of this scale, the scores on the consistent response scale for the entire sample were then compared to a sample of equal size ($N = 524$) containing data that were randomly generated by SPSS. Results of the independent sample t-test revealed that there was a significant difference on consistent response scale scores between the sample for this study ($M = 4.26$, $SD = 2.83$) and the randomly generated sample ($M = 13.56$, $SD = 4.25$; $t(1046) = -41.66$, $p < .001$). Specifically, the random response sample scored significantly higher on the consistent response scale, indicating a higher level of inconsistency in responses to the items on the instrument.

Items for the faking good scale were selected by identifying items where at least 80% of the participants did not select the “never true of me” item response option. Ten items matching this criteria were selected from the habits, self-regulation, and deviant fantasy scales, and summed to comprise the faking good scale. In order to examine the effectiveness of the scale, scores on the faking good scale among the sample used for the study were compared to responses in a smaller sample of participants ($N = 22$), who were instructed to take the assessment as someone who was trying to hide the fact that they had a pornography use problem. For the sake of interpretation, lower scores on the faking

good scale indicate a higher likelihood that the individual is “faking good” on the instrument.

Results of the independent sample t-test revealed that there was a significant difference on faking good scores between the main sample for the study ($M = 22.34$, $SD = 4.55$) and the faking good sample ($M = 17.56$, $SD = 3.21$; $t(503) = 4.97$, $p < .001$). Specifically, the sample instructed to respond to the instrument as if they were trying to hide their pornography use problem scored significantly lower on the scale.

Reliability

The second set of analyses involved evaluating the internal item consistency and test-retest reliability of the entire instrument, and the factors contained within the instrument. Cronbach’s alpha was calculated to evaluate the internal item consistency of the entire instrument and the individual factors. Additionally, descriptive statistics for the instrument following model development were calculated, and can be found in Table 7.

Table 7

Descriptives and Internal Consistency for Total Score and Factors

	Mean (SD)	Range	Cronbach’s Alpha
Total Score	360.89 (130.24)	174 – 681	0.98
Habits (28 items)	57.40 (22.55)	28 – 112	0.97
Sexual scripts (29 items)	65.06 (22.27)	29 – 116	0.97
Negative emotions (10 items)	23.25 (8.81)	10 – 40	0.94
Maladaptive use (19 items)	42.24 (15.67)	21 – 77	0.96
Deviant fantasies (9 items)	18.68 (7.52)	9 – 36	0.93
Self-regulation (9 items)	20.45 (6.76)	9 - 36	0.91

(continued)

	Mean (SD)	Range	Cronbach's Alpha
Aggressive type (18 items)	37.69 (14.86)	18 - 72	0.97
Child type (15 items)	27.33 (14.06)	15 - 60	0.98
Consent type (17 items)	35.42 (14.41)	17 - 68	0.97
Humiliation type (16 items)	33.36 (13.49)	16 - 64	0.96

Note. $N = 524$.

The results of the analysis indicated that the entire instrument, as well as the 10 factors within the instrument, demonstrate excellent internal item consistency, with Cronbach's alpha values for each falling above 0.90.

In order to examine test-retest reliability, a sub-sample ($N = 30$) was given the research protocol twice over a two-week interval. The results of the analysis indicated that there was no significant difference between scores at T1 and T2 (see Table 8). Additionally, results of the Pearson's correlation coefficient indicated that scores at T1 and T2 were highly correlated ($r = .93$), indicating that the instrument demonstrated excellent test-retest reliability.

Table 8

Test-Retest Reliability Analysis Using Paired Sample T-Test

	Mean (SD)		t (df)	p
	T1	T2		
Total score	219.63 (55.57)	232.93 (64.77)	-0.85 (58)	0.39

Note. $N = 30$. T1 = time one; T2 = time two.

Validity of Instrument Scales

In order to examine the validity of the instrument, Pearson's correlation coefficients were calculated for the entire instrument, the 10 factors, and the validity instruments included in the survey protocol. First, correlations between the total score on the instrument and the 10 factors were examined (see Table 9). Significant correlations were found between the total score and all 10 factors, as well as between all 10 factors ($p < .01$), indicating that the factors and the entire instrument demonstrated convergent validity.

Table 9*Total Score and Factors Correlation Matrix*

	1	2	3	4	5	6	7	8	9	10
Total score	-	-	-	-	-	-	-	-	-	-
Habits	0.972*	-	-	-	-	-	-	-	-	-
Scripts	0.936*	0.897*	-	-	-	-	-	-	-	-
Negative emotions	0.661*	0.612*	0.537*	-	-	-	-	-	-	-
Maladaptive use	0.933*	0.918*	0.870*	0.611*	-	-	-	-	-	-
Deviant fantasies	0.946*	0.922*	0.866*	0.626*	0.883*	-	-	-	-	-
Self-regulation	0.890*	0.854*	0.809*	0.693*	0.834*	0.875*	-	-	-	-
Aggressive type	0.958*	0.911*	0.881*	0.559*	0.848*	0.896*	0.822*	-	-	-
Child type	0.930*	0.905*	0.818*	0.609*	0.834*	0.871*	0.794*	0.898*	-	-
Consent type	0.954*	0.904*	0.875*	0.579*	0.859*	0.887*	0.818*	0.944*	0.890*	-
Humiliation type	0.950*	0.909*	0.880*	0.546*	0.850*	0.893*	0.811*	0.960*	0.883*	0.939*

Note. $N = 524$. * $p < .01$.

Correlations between the total score, the 10 factors, and the additional validity measures can be found in Table 9. Due to missing data, the sample size for these validity analyses was reduced to 482 participants. Results of analyses indicate that the total score of the instrument, as well as all of the individual scales, were significantly correlated with scores on the PCI ($p < .01$; $r = 0.40-0.60$), with moderate relationships found for each scale, and the strongest relationship found between the deviant fantasies scale and scores on the PCI ($r = 0.63$). These results provide further support for the convergent validity of the instrument.

Table 9

Correlations with Validity Measures

	BSSS	HBI	PCI	RMA	Grasmick	SES-SFP
Total Score	0.650*	0.615*	0.605*	0.597*	0.843*	0.700*
Habits	0.602*	0.599*	0.588*	0.591*	0.814*	0.690*
Scripts	0.638*	0.544*	0.526*	0.522*	0.787*	0.628*
Negative emotion	0.443*	0.427*	0.428*	0.415*	0.597*	0.495*
Maladaptive use	0.576*	0.556*	0.564*	0.558*	0.760*	0.651*
Deviant fantasies	0.642*	0.645*	0.630*	0.620*	0.809*	0.732*
Self-regulation	0.662*	0.563*	0.567*	0.545*	0.828*	0.653*
Aggressive type	0.629*	0.595*	0.581*	0.562*	0.796*	0.667*
Child type	0.574*	0.582*	0.574*	0.570*	0.804*	0.647*
Consent type	0.621*	0.582*	0.573*	0.554*	0.789*	0.645*
Humiliation type	0.614*	0.584*	0.574*	0.565*	0.781*	0.652*

Note. BSSS = Brief Sensation Seeking Survey; HBI = Hypersexual Behavior Inventory; PCI = Pornography Consumption Inventory; RMA = Rape Myth Acceptance; SES-SFP = Sexual Experiences Survey-Short Form Perpetration.
 $N = 482$.

As for the remainder of the validity measures, the results of the analyses indicate that the total score on the instrument was significantly related to all of the validation measures ($p < .01$; $r = 0.50-0.80$). The strongest correlations in the analyses were between the total score and the measure of self-control (Grasmick; $r = 0.84$), with the correlation coefficient indicating a strong relationship between these measures.

As for the individual scales, the habits scale was significantly related to sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control ($p < .01$; $r = 0.50-0.80$). The strongest correlation was found between habits and self-control ($r > 0.80$). Scripts were also significantly related to sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control ($p < .01$; $r = 0.50-0.80$). Similar to the habits scale, the strong correlation was found between scripts and self-control ($r > .80$). The correlations between the negative emotions scale and measures of sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control were also significant, though these correlations were slightly smaller ($p < .01$; $r = 0.40-0.50$). The maladaptive use scale was significantly related to sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control ($p < .01$; $r = 0.50-0.70$). The deviant fantasies scale demonstrated significant correlations with sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control, with correlations ranging from moderate to strong ($p < .01$; $r = 0.60-0.80$). Similarly, the self-regulation scale demonstrated significant correlations with sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control,

with moderate to strong correlations ($r = 0.50-0.80$). For both scales, the strong correlation was found for the measure of self-control ($r > .80$).

As for the type scales, aggressive, consent, and humiliation type scales were all significantly correlated with sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control, with the strength of the correlations all being moderate ($p < .01$; $r = 0.50-0.70$). For the child type scale, however, significant correlations were found for sensation seeking, hypersexual behavior, pornography consumption, rape myth acceptance, and self-control, with correlations ranging from moderate to strong ($p < .01$; $r = 0.50-0.80$). Similar to the previous scales, a strong correlation was found between scores on the child type scale and the measure of self-control. Together, the results of these analyses indicate that the instrument demonstrates concurrent validity.

The final validity analysis involved assessing whether the total score and the 20 factors were significantly related to a self-report measure of sexually coercive behavior. Results of the analysis indicated that both the total score and the individual factors were significantly related to scores on the SES-SFP ($p < .01$). The strongest correlations in these analyses were between the deviant fantasies factor and the SES-SFP ($r = 0.73$), followed by the total score ($r = 0.70$). Pearson's correlation coefficient values for these relationships yielded strong correlations, with all of the other relationships between the factors and the SES-SFP yielding a moderate correlation. Results of these analyses provide further indication that the instrument demonstrates concurrent validity.

Threshold Analysis

The final analyses for this study involved assessing whether there were significant cut points beyond which scores on the instrument became significantly predictive of engaging in sexually coercive behaviors. For this analysis, rather than using the total score on the SES-SFP, scores were recoded dichotomously. Individuals that reported using threats of physical aggression, drugs/alcohol, or physical force to engage in fondling or penetrative (i.e., oral, vaginal, anal) sexual acts over the last 12 months were coded as a one, and those who did not report any of these acts over the past 12 months were coded as a zero. The results of the analyses can be found in Table 10.

Table 10

Threshold Analysis for Total Score and Factors

	AUC	95% CI	Optimal cut score	Sensitivity	Specificity
Total score	0.823	[0.785 – 0.861]	410.00	0.744	0.852
Habits	0.814	[0.774 – 0.853]	70.00	0.720	0.855
Scripts	0.794	[0.752 – 0.835]	76.00	0.707	0.833
Negative emotion	0.732	[0.687 – 0.777]	-	-	-
Maladaptive use	0.810	[0.771 – 0.849]	51.00	0.738	0.840
Deviant fantasies	0.843	[0.806 – 0.880]	23.00	0.744	0.891
Self-regulation	0.803	[0.763 – 0.842]	-	-	-
Aggressive type	0.806	[0.766 – 0.846]	46.00	0.713	0.858
Child type	0.780	[0.737 – 0.822]	-	-	-
Consent type	0.794	[0.753 – 0.836]	42.00	0.713	0.759
Humiliation type	0.803	[0.763 – 0.843]	41.00	0.701	0.852

Note. $N = 482$.

In line with the correlation analyses previously conducted, the AUC statistic for the total score and all 10 factors indicated that these measures all significantly predicted self-reported sexual coercion ($p < .01$). Furthermore, the AUC statistic indicated a strong effect for the total score (AUC = 0.82), the habits factor (AUC = 0.81), the maladaptive use factor (AUC = 0.81), the deviant fantasies factor (AUC = 0.84), the self-regulation factor (AUC = 0.80), the use of aggressive pornography factor (AUC = 0.81), and the use of pornography containing humiliation (AUC = 0.80). These findings provide evidence of predictive validity for the total score, as well as the individual factors on the instrument. Significant thresholds in the current sample were also identified. While cut points were identified for the total score and each of the ten factors, cut points that demonstrated excellent sensitivity and specificity were found for the total score of the instrument, the habits factor, the sexual script factor, maladaptive use factor, the deviant fantasies factor, the use of aggressive content factor, and the use of humiliating content factor. For each of the other latent factors, cut points could not be identified that provided both acceptable sensitivity and specificity. The exact thresholds for the total score and the individual factors, as well as the sensitivity and specificity for each measure, can be found in Table 10.

CHAPTER V

Discussion

The use of pornography is not a recent human development, and concerns surrounding the potentially harmful effects of its use has prevailed. This is evidenced by research conducted four-to-five decades ago on the potential harms of pornography use. What has changed over the last two decades, however, is the number of individuals who report using pornography. Researchers assessing the use of pornography have revealed that the overwhelming majority of men, and now the majority of women, have been exposed to pornographic material at some point in their life (Sabina et al., 2009; Wolak et al., 2007). Empirical evidence also indicates that, when looking at regular usage, the majority of men report using pornography on at least a monthly basis, with a sizable portion of women reporting at least monthly use as well (Regnerus et al., 2016). Finally, the average age of exposure to pornography continues to trend downwards, with the average age of exposure in recent research being 11 years of age (Marshall & Miller, 2019). The widespread use of pornography among men and women, coupled with the younger-than-ever age at first exposure, has almost unanimously been attributed to internet pornography (Byers et al., 2004).

Researchers investigating the increase in users of pornography state that the availability, anonymity, and affordability of internet pornography has removed some of the hurdles that may have previously prevented individuals from obtaining and using pornographic material (Cooper, 1998; Cooper et al., 2002). Examples of hurdles may include having to visit adult-themed stores to purchase pornographic material, the cost of purchasing pornographic films relative to free pornographic sites, and the necessity of

keeping physical copies of such materials in one's home. Internet pornography provides the ability to access a wide array of material from the privacy of their own home for free. Regardless of the reasons for this increase in users, internet pornography and its widespread use have resulted in an increasing interest in assessing the potential effects of pornography use among researchers and practitioners. Recent systematic reviews examining this body of research have revealed that over the last decade, hundreds of articles have been published by researchers attempting to understand the effects of pornography use (Kohut et al., 2020; Marshall & Miller, 2019). Potential effects that researchers have examined include mental health issues (Kim, 2011; Kohut & Stulhofer, 2018; Tylka, 2015, Weaver et al., 2011), relationship problems (Grubbs et al., 2019; Wright et al., 2017), engaging in risky sexual behaviors (Mahapatra & Saggurti, 2014; Wetterneck et al., 2012; Wright & Randall, 2012), addiction and compulsivity (Kraus & Sweeney, 2019; Kraus et al., 2016), and of most importance to the current study, engaging in sexually coercive behaviors (Mancini et al., 2012, 2014; Marshall et al., 2017; Tomaszewska & Krahe, 2018; Wright et al., 2016; Ybarra et al. 2011).

Research on pornography use and sexual coercion has been conducted for many decades, and was one of the first major lines of inquiry for researchers looking to examine when pornography use becomes problematic. The increase in users of pornography, along with research highlighting the more aggressive nature of modern pornography (Bridges et al., 2010), have fueled interest in this question further over the past few decades. Research looking into the relationship between pornography use and sexual coercion has yielded two findings that have received enough support to garner confidence. First, research has consistently indicated that there is a relationship between

pornography use and sexual coercion, though this relationship may not be causal and is not fully understood. Attempts to understand this relationship have yielded the second important finding from this line of research: there are a number of factors surrounding pornography use that should be considered when assessing this relationship. These factors include habits, sexual scripts, type of pornography used, and compulsivity. Reviews of research over the past decade have provided some insight into potential issues with this body of research. In their review of the operationalization of pornography use over the past decade, Marshall and Miller (2019) highlighted two issues with the operationalization of pornography use: the omission of important aspects in the assessment of pornography use, and inconsistent approaches to measuring pornography use. A more recent review conducted by Kohut and colleagues (2020) provided further support for the assertions made by Marshall and Miller (2019), demonstrating a need to address these methodological issues.

Despite these shortcomings highlighted across a number of reviews over the past decade (Short et al., 2012; Kohut et al., 2020; Marshall & Miller, 2019), this body of research does provide some insight into how pornography use assessment can be improved. It is evident that when considering the relationship between pornography and sexual coercion, researchers would be best advised to assess the frequency of use, investment in use, sexual scripts, compulsive use, and use of violent pornography. Unfortunately, an instrument assessing all of these domains of pornography use has not yet been developed. The existing instruments also exist lack adequate psychometric evaluation and are relatively outdated. The current study aimed to develop the initial item pool and factor structure for a comprehensive problematic pornography use instrument

that accounts for all of the factors identified in previous research. Additionally, the study sought to conduct reliability and validity assessments for the instrument, and to assess whether thresholds that were predictive of sexually coercive behavior could be identified. These thresholds are especially important, as they can aid researchers attempting to identify the point at which pornography use becomes problematic. Results of the analyses provided answers to the research questions asked in the current study.

Discussion of Findings

Instrument Development

The first hypothesis tested in the current study involved assessing whether the items in the item pool would load onto distinct factors of pornography use involving the specific type of pornography used, sexual scripts, compulsivity, and habits. The results of the confirmatory factor analysis provided support for the hypothesis. After removing items that loaded poorly onto their respective factors, and consulting model fit indices to locate any items that more strongly loaded onto different factors and adjusting accordingly, the result was a 170-item instrument that was comprised of all of the proposed factors. These factors included self-regulation, deviant fantasies, maladaptive use, negative emotions, sexual scripts, habits, and use of child pornography, pornography containing aggression, humiliation, and a lack of consent. Scholars have highlighted the idea that pornography use is a multi-dimensional construct (Busby et al., 2017), and taken together, results of this study provide further support for this assertion. The findings for each of the individual factors also provide important implications for the measurement of problematic pornography use.

Factors assessing compulsivity, such as maladaptive use and negative emotions, have been identified in previous efforts to develop instruments assessing compulsive pornography use (Grubbs et al., 2010; Kors et al., 2014; Noor et al., 2014), and the findings from the current study provide further support for the existence of these factors. In addition to supporting previous findings, the findings from the current study add to this body of literature by incorporating deviant fantasies and self-regulating behaviors not directly related to pornography use. Previous instruments assessing compulsive pornography use have not accounted for either of these factors (see Grubbs et al., 2010; Kors et al., 2014; Noor et al., 2014), despite the evidence highlighting the importance of self-regulation and deviant fantasies among individuals who engage in sexual offending behaviors (Allen et al., 2020; Brouillette-Alarie & Proulx, 2019; Tharp et al., 2013). The inclusion of these factors provides an improvement in the measurement of problematic pornography use, and the results of the study support their existence as a latent factor distinct from maladaptive use and negative emotions.

The remaining factors have been given less attention in research, but the findings of the current study also lend support to previous studies indicating that habits, type, and sexual scripts comprise distinct factors of pornography consumption (Malamuth et al., 2000; Marshall et al., 2017; Foubert & Bridges, 2017). The operationalization of these factors in the current instrument also provides an improvement on previous approaches. As mentioned earlier, a number of previous instruments and author-generated approaches are dated in their operationalization of the ways that pornography can be viewed. For instance, the majority of research over the past decade has not included the consumption or storage of pornographic material on smartphones, despite data indicating that this is

now the primary medium to view pornography (Marshall & Miller, 2019). To address this issue, the use and storage of pornography on smartphones was included in the operationalization of habits in the current study. Besides using technologically up-to-date language in the assessment of use, a number of habitual factors that have seen less attention in research, such as monetary investment, age at first exposure, and location of use, were included as items encompassing the habits factor. Researchers, though few in numbers, have highlighted the importance of these factors, rather than just frequency of use (Mancini et al., 2012, 2014; Marshall et al., 2017) in the assessment of problematic pornography use. The results of this dissertation indicate that all of these lesser-researched aspects, along with established habitual factors, such as frequency and duration of use, comprise a latent factor assessing habits of pornography use.

The results of the current study also provide support for the existence of a latent factor assessing sexual scripts. Researchers have assessed sexual scripts as a latent factor, but these studies were limited in their operationalization, either in the number of items (Marshall et al., 2018) or in their focus (Tomaszewska & Krahe, 2016, 2018). The current study sought to improve on previous research by including items that capture all three levels of scripts outlined by the authors of the sexual script theory (Simon & Gagnon, 1998). The results of the CFA provide support of a latent factor comprising all three levels of sexual scripts. Unlike previous operationalizations, the approach in the current instrument provides researchers with the ability to conduct a comprehensive assessment of the theory, as well as use all aspects of the theory when evaluating the level to which an individual derives their sexual scripts from pornography use.

The importance of assessing the type of pornography used by an individual has been well documented in research (see Demare et al., 1993; Gonsalves et al., 2015; Kingston et al., 2008; Seto et al., 2010; Ybarra et al., 2011), with a specific focus placed on use of violent pornography. In addition to this, researchers have also highlighted the importance of using content-specific items to assess use of pornography containing violence, rather than asking individuals if they used “violent pornography” (Marshall et al., 2019). While some researchers have used this approach (Foubert & Bridges, 2017), it is still not the primary method to assessing use of violent pornography. Additionally, there remain other problematic themes in pornography that should concern those interested in assessing problematic pornography use, such as humiliation, consent, and pornographic material containing children. The current study sought to fill this gap in the research through developing items assessing multiple types of pornography, aside from “violent” or “aggressive” material. The findings from the current study provide support for the existence of multiple factors assessing these different pornography “types.”

Finally, results of the instrument development yielded two validity scales that present an important improvement on previous efforts to develop a pornography use assessment. It is evident that social desirability bias is an issue, especially when assessing personal information, such as pornography use (Abma et al., 1997; Regnerus et al., 2016). This issue could be amplified further if an instrument of this type was administered to individuals that have engaged in sexual offending behaviors and are being assessed for pornography use problems. The inconsistency and faking good scales developed for this study can aid researchers and practitioners in identifying individuals who are either providing inconsistent, and thus, invalid responses to the instrument, or are

“faking good” on the questions to avoid being identified as a “problematic pornography user.” Previous assessments presented in the literature review did not contain any validity scales. Because pornography use is still a sensitive topic, and certain individuals may have a vested interest in trying to hide any pornography use, it is important for any pornography use assessment to include these validity scales. While more work must be done to ensure their ability to identify inconsistent responders or those who are faking good, the results of these initial scales are promising.

Instrument Reliability

The second hypothesis involved testing whether or not the items designed for the current study would demonstrate excellent internal consistency and test-retest reliability. Cronbach’s alpha was used to assess internal consistency, and an independent sample t-test, as well as Pearson’s correlation coefficient, was used to assess the test-retest reliability. Internal consistency for the entire 170-item instrument was excellent, along with each of the factors identified in the confirmatory factor analysis. These findings indicate that the items on the entire instrument, as well as the individual items, demonstrate strong internal consistency and are strongly related to each other. Results of the test-retest analysis also provide strong support for the reliability of the instrument. The independent sample t-test revealed that there was not a significant difference between individual scores on the instrument between time one and time two, and the strong Pearson’s correlation coefficient provided further support for this finding. Together, these results indicated that the 170-item problematic pornography use instrument demonstrated excellent reliability.

One of the key issues with the existing measures of pornography use, involve the lack of psychometric assessment. For these instruments, the only psychometric assessment of reliability involved Cronbach's alphas, and for some instruments, they lacked *any* assessment of reliability. The demonstration of excellent reliability, both across tests of internal consistency and test-retest reliability, indicate a marked improvement in the psychometric quality of the instrument developed for the current study, relative to previously developed instruments. This is especially true for the demonstration of excellent test-retest reliability, as none of the previously developed measures provided evidence of test-retest reliability. This statement is by no means implying that the psychometric assessment of the instrument for the current study is complete, but rather, that these initial steps place the current instrument in a more psychometrically established position relative to previously developed instruments. More psychometric assessment of reliability among additional samples is needed, but the evidence gathered from the analyses in the current study do indicate that the 170-item instrument does demonstrate excellent reliability.

Instrument Validity

The next set of hypotheses focused on assessing the validity of the instrument, with the first of these assessing convergent validity. A correlation matrix using Pearson's correlation coefficient was run using the score of the entire instrument, as well as all of the individual factors. Results of the analyses provided strong evidence for convergent validity, with significant moderate-to-strong correlations found among all tested relationships. It should be noted, that the only moderate correlations found in the analyses involved the negative emotions scale. One potential explanation for the relative weakness

of this relationship, can be found in research examining negative emotions associated with pornography use. Scholars have found that negative emotions associated with pornography use do not necessarily track with increased use of pornography, or use of deviant types of pornography (see Grubbs & Kraus, 2021). These negative emotions are attributed to the religiosity of the individual and the guilt associated with pornography use. While an evaluation of this assertion is beyond the scope of the current study, this could be a potential explanation for the slightly weaker correlations, relative to the other factors.

Concurrent validity was assessed through calculating a correlation matrix containing the entire instrument, all of the factors, and measures of hypersexual behavior, pornography consumption, rape myth acceptance, sensation seeking, self-control, and self-reported sexual coercion. Results of the correlation matrix indicate that there were significant moderate-to-strong correlations between the instrument, the factors, and all of the validity measures included in the analysis, with the strongest correlations found between the instrument, the factors, and the measure of self-control. The results of this analysis provide further support for the validity of the instrument, by demonstrating convergent validity with related constructs.

Much like the reliability findings, this demonstration of validity provides a much-needed improvement on the assessment of pornography use. The demonstration of validity was even less common with previous instruments; the only instruments that provided anything beyond construct validity, were the instruments that focused on compulsive pornography use (Grubbs et al., 2010; Kor et al., 2014; Noor et al., 2014; Reid et al., 2011). The most comprehensive instruments identified in previous research

(Hald, 2006; Seigfried, 2007) lacked any examination of validity. Thus, the demonstration of validity offered in the current study provides another much needed improvement on the assessment of problematic pornography consumption. The initial evidence of reliability and validity of the instrument is encouraging, as an instrument of this type would prove useful for a number of professionals.

The need for a problematic pornography use instrument is especially salient among criminal justice and psychological professionals tasked with assessing risk of recidivism, determining the proper level of supervision, and targeting treatment needs for individuals who have sexually offended. Researchers assessing risk of sexual recidivism have identified problematic pornography use, particularly the use of deviant types of pornography, as a potential predictor of sexual recidivism (Kingston et al., 2008). Given the strong correlations between this instrument and measures of sexual coercion, the current instrument could provide such a tool for these individuals.

An instrument assessing problematic pornography use would not just be useful for researchers and professionals tasked with managing individuals who have sexually offended; there are a number of psychologists and psychiatrists who are providing counseling and treatment for individuals seeking help for addictions to pornography, or compulsive use of pornography. It is evident that the majority of instruments developed to assess pornography use have focused on addiction or compulsivity (Grubbs et al., 2010; Kors et al., 2014; Marshall & Miller, 2019; Noor et al., 2014), but these instruments ignore a number of habitual factors beyond maladaptive use and negative emotions. The instrument for the current study went beyond these factors, by assessing self-regulation, deviant fantasies, habits, sexual scripts, and use a different types of

deviant pornography. In light of recent research highlighting the importance of religiosity in the perception of addiction to pornography (Grubbs & Kraus, 2021), it is evident that these instruments would be incomplete without going beyond self-report items assessing an individual's perceived compulsive use of pornography. Habitual factors assessing frequency, monetary investment, and use of pornography in inappropriate places, as well as the use of deviant pornography, must be considered as well. A comprehensive instrument, such as the one developed in this study, would provide such a tool for professionals tasked with providing treatment for individuals seeking help for compulsive pornography use.

In addition to the demonstration of validity and implications for practice, these analyses provide some implications for the importance of some aspects of pornography use and sexual coercion, relative to others. While all of the correlations of the various aspects of pornography use and sexual coercion fell in the "moderate" range, it should be noted that the two largest correlations in the analyses involved the total score on the instrument and scores on the deviant fantasies scale. There is a large body of research that has examined the role of deviant fantasies in engaging in sexually coercive behavior (Allen et al., 2020; Brouillette-Alarie & Proulx, 2019; Tharp et al., 2013), and the results of these analyses align with these findings. This highlights the importance of incorporating the concept of deviant fantasies when assessing problematic pornography use; something that previous instruments have yet to include. Additionally, deviant fantasies seem especially important when considering the roll that pornography use habits may play in sexually coercive behaviors.

Contrary to this finding, it was also shown that scores on the negative emotions factor were the weakest correlations. Though the finding was still significant, the weaker associations indicate that negative emotions stemming from pornography use may not be as useful in determining whether an individual's use of pornography is "problematic." Researchers have consistently found that if individuals are religious, the guilt they experience from using pornography is intensified, regardless of how often they actually use pornography (Grubbs et al., 2020). This means that individuals who score higher on the negative emotion scale may still score lower on the other factors of pornography use. Whether or not this factor is useful in determining problematic use, does not mean that this factor should not be considered when assessing pornography use. This is the first study to assess this specific latent construct of negative emotions and its relationship to sexually coercive behaviors, and more research is needed to validate this finding. Also, even if negative emotions may not be as important when assessing the relationship between pornography use and sexually coercive behaviors, it could still provide useful information for professionals treating individuals seeking help for compulsive pornography use.

Threshold Analysis

The final analysis for the study involved testing whether there were identifiable thresholds in the scores on the entire instrument and individual factors that significantly predicted self-reported sexually coercive behaviors. This hypothesis was tested by conducting an ROC analysis consisting of the total score on the instrument, scores on the individual factors, and a dichotomized variable of engagement in sexual coercion over the last 12 months. First, the Area Under the Curve (AUC) values calculated from the

ROC analysis provided support for the predictive validity of the total score on the instrument and the individual factors. The AUC values for each of the factors and the total score were significant, and after converting the AUC values to Cohen's d using conversions provided by Saldago (2018), it was found that all of the relationships demonstrated strong effect sizes. Second, the sensitivity and specificity for the entire instrument and factors were assessed, in order to determine whether coherent thresholds could be identified. Results of the analysis provided some support for this hypothesis, with the entire instrument and a majority of the factors yielding identifiable thresholds with adequate sensitivity and specificity.

While thresholds favoring stronger sensitivity or specificity could be identified, for the purpose of the current study, thresholds providing the best balance between sensitivity and specificity were selected. For each of the selected thresholds, the sensitivity fell between 0.70-0.80, and the specificity generally fell slightly above 0.80, demonstrating a strong balance between being able to identify individuals who engaged in sexually coercive behaviors, as well as identifying those who had not engaged in such behaviors. Thresholds were found for the total score, and scales assessing habits, scripts, maladaptive use, deviant fantasies, use of aggressive pornography, use of pornography lacking consent, and use of pornography containing humiliation. The highest values of sensitivity and specificity were identified for the total score on the instrument and the deviant fantasies scale. This finding was to be expected, given the stronger relationship identified between the total score, deviant fantasies, and the score on the measure of sexual coercion. Across the score distributions, the thresholds fell in the 65-70% percentile range, indicating that individuals falling in the top third of scores on the total

score and individual scales were at the highest risk of engaging in sexually coercive behavior.

Findings from the threshold analyses provide some implications for assessment. First, these analyses indicate that there are meaningful thresholds across the domains of pornography use that are predictive of engaging in sexually coercive behavior. This indicates that it is not simply a somewhat frequent pornography use habit, or a moderate adoption of sexual scripts from pornography use that is problematic. Pornography use, and the domains identified in this study, seem to comprise a continuum along which some use is not problematic. The evidence from the current study indicates that it is individuals who are in the top percentiles of habitual factors, the adoption of scripts, the use of a wide variety of deviant types, and issues with deviant fantasies and maladaptive use that demonstrate problematic pornography use. From a more practical standpoint, thresholds for scores on this assessment could aid professionals tasked with determining treatment and supervision needs. More specifically, for individuals who have committed a sexual offense and are being released into the community, decisions about limiting access to the internet could be aided by determining whether the offender's pornography use habits placed them at a higher risk of engaging in sexual offending behaviors. Similarly, if pornography use represents a problematic behavior that places them at a higher risk of engaging in these behaviors, the professionals tasked with treating these individuals can focus on pornography use habits in their treatment protocol.

These findings indicate that when using this instrument to assess the relationship between their pornography use habits and their propensity to engage in sexually coercive behaviors, scores on the entire instrument and the deviant fantasy scales should be

considered, followed by habits, scripts, maladaptive use, and use of pornography containing humiliation, aggression, and a lack of consent. That being said, this is the first set of threshold analyses conducted for this instrument, and more research assessing these thresholds must be conducted.

Results of the analyses provided strong support for the hypotheses that were developed for the study. Namely, that the developed items would load onto the predicted factors, that these factors would demonstrate reliability and validity, and that thresholds predictive of sexually coercive behavior would be identified. There are some limitations in this study that must be considered.

Limitations

The first limitation that must be considered involves the sample for the current study. The sample consisted of individuals gathered from a rural college in the Southern United States, and individuals from the online surveying platform MTurk. Both of these sampling methods have their drawbacks. It is widely known that samples consisting of college students are not the most representative (Bachman & Schutt, 2019; Rennison & Hart, 2019), and the current study is no exception. While this may lead to issues involving the generalizability of findings, there are some benefits to using college males in the current study. Researchers have noted that the most frequent users of pornography tend to be males in the college-age range (Regnerus et al., 2016), so a sample containing college males would be ideal for the development of a problematic pornography use instrument. The geographic location of the sample, however, provides additional limits to generalizability. The college being located in the rural South of the United States may present some issues with higher levels of religiosity (Pew Research Center, 2015), which

could result in underreporting due to social desirability issues. In order to address this issue and increase the generalizability of the findings, the sample also consisted of individuals gathered through MTurk.

Researchers have found that MTurk samples tend to be more representative than college samples (Goodman & Paolacci, 2017), but MTurk samples also have their limitations. First, while researchers have found that MTurk samples are more representative than college samples, there are still some generalizability issues. Namely, studies have found that the ethnic breakdown of “workers” on MTurk tends to favor individuals who identify as White or come from South Asian countries (Arditte et al., 2016; Mortensen & Hughes, 2018). Additionally, some researchers have demonstrated concern about the validity of data gathered from “workers” on MTurk (Buhrmester et al., 2018). Chief among these issues, lie concerns regarding “workers” rushing their way through surveys as quickly as possible, in order to make money in a short amount of time, though this assertion has been addressed in research (Goodman & Paolacci, 2017). Regardless of these noted issues, MTurk remains a valuable and convenient asset to researchers looking to gather a more representative sample than may be available to them from college students.

It should also be noted that the sample for the current study only consisted of men and the overwhelming majority of these men identified as heterosexual. Thus, these findings can only be generalized to heterosexual men. Similar to the college sample, however, studies consistently show that more men use pornography and do so on a more frequent basis (Regnerus et al., 2016; Sabina et al., 2009; Wolak et al., 2007). Thus, a sample of men was ideal for the initial development of this instrument, though future

studies should focus on refining this instrument for use with women, as pornography is still used by a large portion of women (Regnerus et al., 2016), and has also been found to be significantly related to sexual coercion perpetration in adolescent and college women (Bonino et al., 2006; Brown & L'Engle, 2009; Marshall et al., 2020; Simmons et al., 2012; Ybarra et al., 2011). The final limitation for the sample of the current study involves the size of the samples. While the sample for the main analysis was large enough to conduct the CFA (Muthen & Muthen, 2002), the sample was not as large as is preferred for a model containing the number of items included in the current study (Wolf et al., 2013). Additionally, the samples for the test-retest and faking good analyses were small. Future validation efforts for this instrument should include larger samples to increase confidence in the strength of these findings.

The next limitation involves the measure of sexual coercion used for the current study. While the SES-SFP (Koss et al., 2007) has received considerable support as a measure of sexually coercive behaviors (Anderson et al., 2017; Johnson et al., 2017; Kuo et al., 2019), it is not without its limitations. The instrument is designed to measure a large portion of sexually coercive acts and the tactics used to engage in them, not all of which fall under illegal behaviors. These include lying to someone or verbally pressuring someone to engage in sexual activities. This is not to condone lying or pressuring someone into engaging in sexual activities, but rather, acknowledging that this assessment should not be viewed of as a measure of criminal behavior; it is a measure of the spectrum of sexually coercive behaviors. Some scholars have found that pornography use may be more strongly related to acts of verbal coercion, rather than physical coercion (D'Abreu & Krahe, 2014; Franklin et al., 2012; Wright et al., 2016), so for the purpose of

the current study, it was appropriate to use a measure of sexual coercion that assessed a wider variety of sexually coercive behaviors.

The final limitation to address involves the cross-sectional nature of the study. Because of the cross-sectional nature of these data, the ability to draw any implications for temporal order in the relationship between scores on the pornography use items and the measure of sexual coercion used for the study is limited. It should be noted that the overall purpose of the current study was to begin the development and psychometric assessment of a problematic pornography use instrument, and because of this, a cross-sectional sample was considered appropriate.

The Future of Pornography Use Assessment

Findings for the current study provide some insight into how assessment of pornography use can be improved moving forward. First, though it was already quite apparent that comprehensive and accurate assessment of pornography use requires the consideration of a number of aspects of use, the results of the current study indicate that these aspects of use represent distinct constructs. This provides further confirmation to the notion that aspects of pornography use represent coherent constructs that can be assessed (Busby et al., 2017; Marshall et al., 2018). As researchers move forward in the assessment of problematic pornography use, further validation of these factors among more diverse samples is needed. This can help researchers build more confidence in the existence of these latent constructs, and move the field towards a better understanding of the relationship that pornography has with a number of harmful behaviors and effects.

For instance, the current study only included college-age and general population males. The need for developing a problematic pornography use instrument among this

population is important, but it is equally important among samples of women. In addition to samples of women, it is even more important to assess the utility of this instrument with samples of individuals who have sexually offended. The importance of assessing pornography use among individuals who have sexually offended has been demonstrated in previous research (Kingston et al., 2008), but in order to be confident in the use of this specific instrument among this population, further work is needed. Finally, there are an increasing number of individuals who are seeking help for compulsive pornography use, or a perceived addiction to pornography (Grubbs et al., 2020). Because this a growing population that may have unique needs and characteristics, it would also be necessary to assess the psychometric qualities of this instrument with samples of these individuals.

Beyond assessing whether or not these constructs hold together among more diverse samples, there is a number of important tasks that must be undertaken to contribute to the quality of the instrument. The reliability and validity of the instrument must also be assessed using the diverse samples mentioned in the previous paragraphs. The instrument demonstrated excellent internal consistency and reliability, and the total score on the instrument and scales were significantly correlated with related constructs, but this finding cannot be generalized beyond the populations from which this sample was drawn. It has yet to be demonstrated among women, individuals who have sexually offended, and individuals seeking help for compulsive pornography use. Future research must examine the reliability and validity of this instrument among these populations.

The validity scales for the current instrument must also be refined further. Results of the analyses did provide encouraging results for the utility of these validity scales in determining whether individuals are responding consistently to the items, or whether the

individuals were “faking good” on the test, but these analyses contained small sample sizes that were limited in their generalizability. More work with larger and more diverse samples is needed in order to further validate the scales. Specifically regarding the faking good scale, additional items should be designed and included that are designed for the faking good scale. By adding additional items to this scale, this should ideally improve the quality of the scale and the ability of the scale to accurately identify those who may be faking good on the instrument.

The thresholds identified by the analyses in the current study must also be assessed in future research. Analyses for the current study provided helpful information, specifically regarding whether or not thresholds could be established for sexual coercion, and the results do imply that they can. Moving forward, future research should use more representative samples, and samples across the populations mentioned in the previous paragraphs, in order to further examine these thresholds and identify thresholds across a multitude of problematic behaviors that could be useful in predicting problematic pornography use. Beyond sexual coercion, useful thresholds may include identifying individuals who should help for compulsive pornography use and identifying individuals who may be at risk of engaging in child pornography offenses. Similarly, next steps for the instrument should also include developing norms among different populations. The current study contained a sample that was large enough to conduct the psychometric analyses for the study, but in order to develop norms, larger samples that are more representative must be included. Furthermore, these norms must be established for men and women, different age groups, offending populations, and clinical populations.

In addition to assessing the outcome of sexual coercion, there are other potentially problematic outcomes that this instrument may be useful in assessing. These may include child pornography offenses, exposure to sexually transmitted infections (STIs), unwanted pregnancy, and negative relationship outcomes. The former of the listed outcomes may prove useful for criminal justice personnel who are tasked with assessing sexual risk behaviors similar to sexual coercion, as the production and possession of child pornography make up a significant portion of individuals who sexually offend (Terry, 2012). Additionally, transmission of STIs, unwanted pregnancy, and negative relationship outcomes are outcomes that are detrimental to society, and the usefulness of this instrument in predicting these outcomes should be assessed, as pornography use has been found to be associated with these problematic outcomes in previous research.

CHAPTER VI

Conclusion

Use of pornography has been, and continues to be, an issue that has sparked controversy. From moral to public health panics, pornography continues to be the target of concern among a portion of the greater public, as well as some lawmakers and academics. Researchers examining potential effects of pornography consumption have actually given some credence to concerns surrounding public health issues, particularly issues surrounding pornography use and engagement in sexually coercive behaviors. This line of research has provided ample proof that there are aspects of pornography use that are associated with sexual coercion, but limitations in this research preclude researchers from developing a comprehensive understanding of this relationship. One of the most important limitations identified in previous research involves the way pornography use has been assessed. The purpose of the current study was to address this limitation in research, through developing a comprehensive problematic pornography use instrument.

The items proposed for the instrument assessed all of the factors that have been identified as important to consider, when assessing risk of engaging in sexually coercive behavior, as well as other potentially negative outcomes. Results of the study provided support for the existence of these factors as latent constructs that comprise what we consider “problematic pornography use,” and reliability and validity analyses provided psychometric support for a 170-item instrument that assessed these latent constructs. The latent constructs developed from the initial item pool, as well as the entire instrument, was also found to be associated with sexually coercive behavior. Additionally, thresholds with high levels of sensitivity and specificity were identified in the total score and

individual factors that were effective in predicting engagement in sexually coercive behaviors. The instrument developed in the current study provides a much-needed step forward in the conceptualization, assessment, and potential interventions for individuals who engage in problematic pornography use.

It is evident that pornography consumption and the concerns surrounding potential harmful effects of pornography use will not be going away. Technological advancements will only continue to make pornographic material more available to a larger number of individuals. Criminal justice professionals, researchers, psychologists, and psychiatrists who are tasked with addressing some of the problematic outcomes of pornography use can only be as effective as the tools that are provided to them. Scholars continue to disagree whether concerns around the negative effects of pornography use are overblown, but one thing they do not disagree about, is the need for improvements in how researchers assess problematic pornography consumption. The instrument developed in the current study provides an initial step towards providing such a tool. Future research should continue to refine this instrument through validating the factor structure in diverse samples, conducting additional tests of reliability and validity, and developing norms among these diverse samples. The development of this instrument will not answer any questions regarding whether or not pornography use causes sexual coercion, relationship issues, or risky sexual behavior, but it can equip researchers with the tools necessary to begin the long journey of attempting to answer these questions.

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- Marshall, E. A.,** Miller, H. A., Cortoni, F. A., & Helmus, L. (2020). The Static-99R is not valid for women: Predictive validity in 739 females who have sexually offended. *Sexual Abuse*. Advance online publication. doi:<https://doi.org/10.1777/1079063220940303>
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