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## ANCOVA Study of Psychotherapy Treatment of Internet Pornography Addiction in Heterosexual Men

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ANCOVA STUDY OF PSYCHOTHERAPY TREATMENT OF INTERNET PORNOGRAPHY

ADDICTION IN HETEROSEXUAL MEN

By Saudia Twine

The Internet, pornography, and compulsivity have become a major problem within the past decade. Together, they create a very dangerous cocktail. The Internet is a significant aspect of everyday life, where 70% of Americans have Internet access thus providing an avenue of contact with others nearby and around the globe (Kalman, 2008). However, its usage and convenience may come with a price for some.

The introduction of the Internet has expanded the consumption of pornographic materials. Internet pornography has seen a surge in pornographic websites from 28,000 to 4.2 million from 1998 through 2007; and is now reported as being the most common source of pornography exposure (Ayres & Haddock, 2009; Beaver & Paul, 2011; Kalman, 2008; Luder, Pittet, Berchtold, Akre, Michaud & Suris, 2011; Paul & Shim, 2008). Internet pornography makes up nearly 20% of the annual total of U.S. pornography revenues (Kalman, 2008). Pornography has been labeled as the sexual revolution of the millennial age and has been suggested as reversing trends toward normalization among the population (Beaver & Paul, 2011; Philaretou, Mahfouz & Allen, 2005; White & Kimball, 2009). Sexual websites are visited by one third of all Internet users with 40 million adults regularly visiting pornographic websites (Ayers & Haddock, 2009; Beaver & Paul, 2011; White & Kimball, 2009).

INTERNET PORNOGRAPHY EPIDEMIC

Digital technologies have lowered the barriers to production and allowed virtually anyone with access to a video camera and an Internet connection to become a participant in the world of pornography. This accessibility has widened the sphere of pornographic representation and opened it up to the world (Garlick, 2010). As the number one searched topic on the Internet, 20-33% of online users (172 million Americans) use the Internet for sexual purposes (Ayers & Haddock, 2009; Beaver & Paul, 2011). With an annual growth rate of over 9.2% (Ayres & Haddock, 2009), Internet pornography welcomes all ages, gender, education and income levels (Green, Carnes, Carnes & Weinman, 2012).

The anonymity, affordability and accessibility (the triple-A effect) of the Internet opens a portal of information with no boundaries (Beaver & Paul, 2011; Gardner, 2001; Green et al., 2012; Hertlein & Stevenson, 2010; Jones & Hertlein, 2012; Kalman, 2008; Wetterneck, Burgess, Short, Smith & Cervantes, 2012). With nearly 50% of all Internet use related to sexually oriented websites, the Internet pornography business was reported as a 13 billion dollar industry in 2005, and in 2006, world pornography revenue was estimated at 97 billion dollars which is more than popular and heavily trafficked Internet engines of Microsoft, Google, Amazon, eBay, Yahoo, Apple and Netflix combined (Hilton & Watts, 2011; Kalman, 2008; Paul & Shim, 2008; Wetterneck et al., 2012; White & Kimball, 2009).

The surge in Internet pornography usage lies within the pornographic images representation once it is accessed via the Internet. Researchers have argued that pornography changes when it is viewed on a computer because the technology through its enticing real time similarity excites and embodies new forms of pleasure (Garlick, 2010). Sixty six percent of male

Internet users aged 18-34 consume online pornography at least once a month (Popovic, 2011). Males are more likely to view erotic material online and offline; and they have been reported to go online at an earlier age to view sexual materials (Beaver & Paul, 2011; Corley & Hook, 2012). Researchers have found that 20% of males admit to using their work computers for sexual reasons (Corley & Hook, 2012; Kalman, 2008; White & Kimball, 2009).

### OPERATIONAL DEFINITION

Terminology for Internet pornography is varied. The lack of consensus in the terminology for Internet pornography is partly due to the debate in labeling behavior patterns which contributes to the lack of an official diagnosis from the mental health world as seen by other disorders included within the Diagnostic Statistic Manual (Briken, Habermann, Berner & Hill, 2007; Green et al., 2012; Grubbs, Sessom, Wheeler & Volk, 2010; Jones & Hertlein, 2012; Twohig & Crosby, 2010). To understand the variations and degrees resultant of Internet pornography use, additional terminology must be defined.

*Impulsivity* is understood as an action toward engaging in pleasurable activities with little forethought. Sexual *compulsivity* is the insistent, repetitive and intrusive urge to engage in sexual behaviors. It tends to be associated with the idea of removing a negative feeling and likened to compelling, nagging or distracting feelings that one must engage in a certain behavior (Paul & Shim, 2008; Wetterneck et al., 2012). Researchers use online sexual activity and cybersex interchangeably as terminology for Internet pornography. *Online sexual activity and cybersex* includes viewing and downloading visually oriented media such as pornography. For the purposes of this proposal Internet pornography will be the terminology of use.

### ADDICTION

Addiction is when a person compulsively uses sex to alter his or her mood to produce pleasure and/or to provide escape from internal discomfort and is employed in a pattern characterized by recurrent failure to control the behavior and continuation of the behavior despite significant negative consequences (Green et al., 2012; King, 2009; Kwee, Dominguez & Ferrell, 2007; Miner, Coleman, Center, Ross & Simon-Rosser, 2007; Twohig & Crosby, 2010). Addicts access a quick fix that allows for immediate gratification (Kalman, 2008; Paul & Shim, 2008). The triple-A effect on cyber sex plays a role in hooking an individual because the Internet creates a sense of timelessness, real-time sexual behavior and diminishes inhibition (Corley & Hook, 2012; Gardner, 2001; Grubbs et al., 2010; White & Kimball, 2009). Internet pornography is labeled as being the primary reason why many preexisting problems with other forms of pornography have been exacerbated within the past decade and why many individuals who would not have normally been involved with pornographic material prior to the advent of the Internet, have been drawn into problematic pornography consumption that with its convenience makes it easy for latent desires to be realized in cyberspace (Kalman, 2008). This effect leads to six significant features of the Internet's role in Internet pornography addiction: imposing, inexpensive, integral, interactive, intoxicating and isolating (Kalman).

Defined as an out of control or self-gratifying sexual behavior, addiction causes distress or impairment of social functioning as well as the loss of control over one's ability to make choices about one's sexual behavior. This dysfunctional habit becomes unconscious (Roller, 2004; Schaeffer, 2009). The addict feels unable to control and includes accompanying feelings of

powerlessness, emptiness, hopelessness, depression, shame and guilt following the completion of the sexual experience (Green et al., 2012; Landau, Garrett & Webb, 2008; Philaretou, Mahfouz & Allen, 2005; White & Kimball, 2009). More than half of male Internet pornography users indicate their pornography use is problematic in at least one major area of life with the greatest implications evidenced in their psychological, spiritual, behavioral and social domains (Wetterneck et al., 2012). If left unattended, the addiction eventually causes severe distress and despair for the individual and/or his or her partner.

Although a definitive universal definition has been adopted by mental health professionals across the globe, researchers have outlined the criteria for Internet pornography addiction to include: (1) maladaptive preoccupation with use, obsessive thinking about the behavior, opportunities and fantasies (2) loss of control and an inability to stop the behavior despite negative consequences caused by the behavior (3) tolerance, in that it takes more of the behavior or greater risk associated with the behavior to achieve satisfaction or relief (4) unsuccessful attempts to control or stop the behavior (5) withdrawal symptoms such as increasing anxiety or irritability when attempting to cut back or stop the behavior (6) use of behavior to escape from problems or dysphoric mood (7) excessive use for periods of time longer than planned (8) interference with social, relational, occupational or other important areas of functioning (9) severe consequences due to sexual behavior (10) an ongoing desire or effort to limit sexual behavior (11) sexual obsession and fantasy as a primary coping strategy (12) increasing amounts of sexual experience because the current level of activity is no longer sufficient (Briken et al., 2007; Grubbs et al., 2010; Jones & Hertlein, 2012; Paul & Shim, 2008; Plant & Plant, 2003; Wetterneck et al., 2012).

The sexually addicted/compulsive individual spends more time online engaged in sexual behaviors than do non-addicted/compulsive individuals thus averaging more than 11 hours per week (Corley & Hook, 2012; Gardner, 2001). Hours of Internet pornography use per week was found to be related to both impulsivity and compulsivity (Wetterneck et al., 2012). Addicts use pornography, fantasy and masturbation to fulfill the rush without the intimacy of a relationship (Landau, Garrett, & Webb, 2008). These feelings of enjoyment during the cybersex pursuit lead to the increased likelihood of return visits to a pornographic website and eventually changes in the user's behavior such as intention to subscribe and increased Internet time (Philaretou et al., 2005). Internet pornographic compulsion originates in delusional and faulty thought processes rooted in the user's belief system (Philaretou et al.).

### NEUROBIOLOGICAL CHANGE

Addiction causes a chemical changes in the brain, anatomical and pathological changes (Hilton & Watts, 2011). Addiction occurs when pleasure/reward pathways are commandeered by drugs or by natural processes essential and inherent to survival, such as food and sex (Hilton & Watts, 2011; Landau et al., 2008). High activity is associated with a bias toward choosing immediate rewards (Landau et al., 2008). The addiction cycle is pleasurable at first, and physiological reinforcement maintains the behaviors. The pleasurable physiological responses initiate sexual behavior, and the physiological and psychological reinforcement that results from the behavior maintains the cycle (Wetterneck et al., 2012). Impaired functioning of the frontal cortex impairs the addict's ability to objectively judge the danger and negative impact of his or her sexual behavior, thus giving in to impulses and sexual cravings by looking for immediate stimulation and gratification (Landau et al., 2008).

## NEGATIVE CONSEQUENCES

Internet pornography addiction results in individual, relational, physical, and psychological destructive and negative effects. Internet pornography has destructive effects to an individual's work, finances, legal trouble, psychological distress, intimacy and relationships: a reduction in the emotional connection with a spouse, sexual dysfunction, creating problems with trust, sex, openness, depression, anxiety, decreased sexual satisfaction with partner's sexual performance, affection and physical appearance, and risky sexual behavior (Ayers & Haddock, 2009; Beaver & Paul, 2011; Green et al., 2012; Kalman, 2008; Laaser & Gregoire, 2003; Landau et al., 2008; Luder et al., 2011; Paul & Shim, 2008; Popovic, 2011; Twohig & Crosby, 2010; Wetterneck et al., 2012; White & Kimball, 2009). Additionally, negative effects of pornography consumption include users being at risk for developing maladaptive attitudes, and callousness towards women, trivialization and acceptance of rape myths, aggression, increased risk for developing sexually deviant tendencies, distorted perceptions about sexuality, increased appetite for more deviant and bizarre types of pornography, committing sexual offenses or being a victim of cyber stalking, online sexual assault, identity theft or cloning, cyber gender harassment, morphing, domestic violence and devaluation of the importance of monogamy (Ayers & Haddock, 2009; Corley & Hook, 2012; Kalman, 2008).

The impact of pornography consumption in romantic relationships due to its frequent habitual use has negatively impacted partners, relationships and family (Ayers & Haddock, 2009; Landau et al., 2008; Popovic, 2011). For individuals living with a partner, or married with children, consuming pornography consumption also decreases time spent with children, and increased risk for children to be exposed to pornography and separation or divorce from one's spouse (Ayers & Haddock, 2009; Hertlein & Stevenson, 2010; Kalman, 2008; Landau et al., 2008; White & Kimball, 2009). In addition, significant factors in engaging in compulsive pornography use have resulted in user's fear of intimacy, anxiety, low self-esteem and obsessive-compulsiveness (Popovic, 2011).

## TREATMENT

Effective treatment is needed for those who have the courage and desire to change their destructive addictive behavior. Therapists need to be prepared to treat such individuals. With the increase of Internet pornographic users and growth of the Internet, therapists will be increasingly called upon to help clients address pornography related issues (Ayers & Haddock, 2009). With such alarming numbers of Internet pornography use, the potential of developing Internet pornography addiction or at the very least overindulging in its consumption and use is staggering (Ayers & Haddock, 2009). These problematic and addictive behaviors have the potential to be one of the greatest triggers for relapse. If they are not addressed, it will greatly increase relapse (Landau et al., 2008). Cognitive Behavioral Therapy (CBT) and Acceptance Commitment Therapy (ACT) are two forms of therapy based upon their theoretical foundation of addressing one's perception of their experiences, thought process and resulting behavior. They may be helpful in treating the compulsive behavior of Internet pornography addicts.

## Cognitive Behavioral Therapy

Cognitive-Behavioral Therapy (CBT), when used appropriately can prepare the ground for longer-lasting change in clients suffering from Internet pornography addiction (Fjerkenstad, 2012; Twohig & Crosby, 2010). Like other forms of compulsion, cybersex compulsion can be treated with cognitive behavior techniques, which teach patients how to identify and solve the problem as well as how to learn coping skills to prevent its relapse. Treatment often includes the addition of support groups with similarly affected individuals, as this is recommended as a valuable source for social, emotional, and psychological support (Jones & Hertlein, 2012; Philaretou et al., 2005). Change in cognition can have a significant influence on emotional and behavioral functioning (Gabbard, 2009).

CBT responds to the cognitive representations of the environment rather than responding directly to the environment itself. Schematic content is evident in the beliefs, attitudes, and assumptions held by the individual. Because schematic content takes the form of propositions that are abstracted from daily experience, schemas guide one's interpretation of life experiences (Gabbard, 2009). These cognitive representations - thoughts, interpretations, beliefs and attitudes- can be monitored, evaluated, and modified.

CBT aims to modify dysfunctional thinking at the cognitive level of processing automatic thoughts, which may contain irrational beliefs. Cognitive behavior therapy is successful in addressing schema formation as it considers the various psychological possibilities attributing to one's problems (Briere & Scott, 2006; Gabbard, 2009). Because automatic thoughts and images may not be readily apparent, therapists teach clients to identify and correct their cognitive errors (Gabbard, 2009). CBT seeks to find the answer as to what caused clients to think, feel, and behave the way they do. For the person addicted to Internet pornography, this form of therapy allows the therapist and the addict to discover the reasoning behind the experience, which contributes to the behavior. Once understanding of the event is discovered, it is corrected thus ultimately changing the individuals' thought processes and their behavior.

## Acceptance Commitment Therapy

Research has discovered that the treatment of problematic Internet pornography use with acceptance commitment therapy (ACT) decreased associated distress and improved quality of life (Wetterneck et al., 2012). ACT, which specifically targets experiential avoidance, has been found to significantly reduce experiential avoidance and Internet pornography viewing time (Wetterneck et al., 2012). To date, ACT has been helpful in the treatment of controlling habits, such as nicotine smoking cessation, polysubstance abuse, marijuana dependence, and reversal in the treatment of trichotillomania and skin picking. ACT is a process-based intervention and recognizes the shared processes that support many forms of pathology (Twohig & Crosby, 2010).

Research is minimal for the use of randomized, no controlled trials with ACT as treatment for Internet pornography addiction (Twohig & Crosby, 2010). ACT targets seven particular processes that aim to decrease the effects of many inner experiences on overt behavior and increase the effects of other inner experiences on one's actions (Twohig & Crosby, 2010): acceptance (willingness to experience inner experiences and not work to regulate them when useful), defusion (experiencing inner experiences as they are without additional verbal functions), self as context (experiencing oneself as the context in which inner experiences occur

and not being defined by inner experiences), being present (noticing inner and outer experiences as they occur, nonjudgmental), values (areas of life that are important that one is willing to work toward improving) and committed action (moving in the valued direction). Overall, the focus on the six processes fosters psychological flexibility, where the ability to move in a meaningful direction without particular regard for any inner experience (Twohig & Crosby, 2010). Inner experiences are targeted through addressing the aforementioned.

ACT is a type of psychotherapy that falls under the CBT umbrella, because it focuses on processes and targets inner experiences (thoughts, feelings, and bodily sensations), utilizes behavior change strategies, targets problems as they are presently occurring and has an empirical focus (Wetterneck et al., 2012). By teaching the addict to address his or her inner experiences, the addict takes control as opposed to the behavior taking control to avoid the feeling the addict experiences from the recollection or avoidance of the experience. Treatment, that focuses on behavior change, which results from a struggle with inner experiences, provides direction for behavior change most applicable to Internet pornography viewing (Twohig & Crosby, 2010).

## RESEARCH QUESTIONS AND HYPOTHESIS

### *Research Questions*

Will heterosexual men with Internet pornography addiction decrease in Internet pornography viewing after undergoing psychotherapy treatment?

Will Cognitive Behavioral Therapy or Acceptance Commitment Therapy provide the greatest decrease in Internet pornography addictive behaviors in heterosexual men?

### *Hypothesis*

Hypothesis Treatment of ACT or CBT therapy will not co-vary with Internet pornography addiction in heterosexual men.

Null Hypothesis Treatment of ACT or CBT therapy will positively co-vary with Internet pornography addiction in heterosexual men.

## METHOD

### Setting and Participants

Investigators will recruit participants through the New Life Counseling Agency located in Detroit, Michigan. The agency receives clients based on referrals from the Department of Human Services, prior clients and local advertising within the Metro Detroit community. The sample will consist of 75 heterosexual males who have been contacted via the agency for the presenting problem of addiction to Internet pornography. The sample will consist of heterosexual males between the age of 25-45 who are residents of the local Metro Detroit community and its surrounding suburbs. Participants who meet the criteria for addiction to Internet pornography will be asked to participate in the study. Participants will be asked whether they would participate even if treatment were delayed. Only those who agree will be included in the study; all others will be given a referral to another therapist/agency for treatment of their addiction.

Respondents who meet the study's requirements will be asked to participate in the study. Participants in the study must willfully view pornography for seven or more hours on a weekly

basis; Internet pornography pertains to only adult heterosexual sex; and possess at least five of the criteria (listed below) for Internet pornography addiction for at least six consecutive months: (1) maladaptive preoccupation with use, obsessive thinking about the behavior, opportunities, and fantasies, (2) loss of control and an inability to stop the behavior despite negative consequences caused by the behavior, (3) tolerance, in that it takes more of the behavior or greater risk associated with the behavior to achieve satisfaction or relief, (4) unsuccessful attempts to control or stop the behavior, (5) withdrawal symptoms such as increasing anxiety or irritability when attempting to cut back or stop the behavior, (6) use of behavior to escape from problems or dysphoric mood, (7) excessive use for periods of time longer than planned, (8) interference with social, relational, occupational or other important areas of functioning, (9) severe consequences due to sexual behavior, (10) an ongoing desire or effort to limit sexual behavior, (11) sexual obsession and fantasy as a primary coping strategy, and (12) increasing amounts of sexual experience because the current level of activity is no longer sufficient.

### Procedure

Prior to implement the study, the investigator will submit all material required to the institutional review board (IRB) in order to obtain permission to conduct the study. Once the informed consent form is approved by the IRB, the investigator will begin the preliminary steps to begin the study. Participants will be instructed that confidentiality will be upheld. No information received by participants will be used outside of research purposes. Each participant will complete a consent form, which explains the purpose of the study, and the possible benefits and harms that might result from inclusion in the study. Participants will be informed that they are not required to participate and that it is their right to withdraw from the study at anytime without penalty. Participants will be informed that in order to be included in the study they will be expected to sign the consent form. No treatment will begin without a signed consent form from the participant.

In order to obtain participants for the study, the agency will send out a mailer to all previous and current male counselees. The mailer will detail the study and its purpose and ask those interested to contact the agency for consideration to participate in the study. Using a script, initial phone calls will be administered by trained staffers explaining the study in detail. Respondents who meet the requirements for Internet pornography addiction asked during the initial phone consultation will be invited to the agency to complete assessments to determine qualification to participate in the study. Respondents will complete pretest assessments to determine co-occurring disorders and to determine the severity of the Internet pornography addiction. Any respondents who have co-occurring disorders will be referred to other clinicians to treat their co-morbidity and addiction. Participants for the study will consist of heterosexual men who report excessive Internet pornography use (seven or more hours of viewing per week) and who have met at least five items for the criteria for Internet pornography addiction. The study will exclude those addicted to homosexual and child Internet pornography addicts.

The study will consist of an eight week pretest/posttest random control group design. Participants will receive a pretest (week 1), posttest (week 9), and three-month follow-up (week 13). Treatment providers will consist of three (3) male doctoral level counseling students. The treatment providers have received extensive training in either the CBT or ACT therapies. Treatment providers will receive their treatment group through randomization of drawing numbers. Providers will follow a treatment manual to conduct group CBT or ACT therapy.



Although both therapies provide CBT structure, ACT therapy focuses on changing the feeling (by addressing experiential avoidance) which in turn will control habits; whereas CBT concentrates on changing the automatic thought processes which in turn will change the behavior.

To help ensure completion of the study, participants will receive dinner at the prior to each week's treatment session and a \$25 restaurant gift card upon completion of follow-up assessments. For eight weeks, the treatment group will receive 1.5-hr weekly therapy for the treatment of Internet pornography addiction. Participants will be placed in either the control group or treatment (ACT or CBT) group by the use of grouping participants into blocks. Wait-list control participants will be promised treatment in nine weeks at which time therapy will begin for these participants at that time.

### Instruments

#### Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales

Created by Janssen, the SIS/SES scales measure the propensity for sexual inhibition and excitation in men. This scale focuses on sexual response patterns rather than values, attitudes, and behavioral tendencies. Inhibition items were written to reflect situations in which existing sexual arousal is lost due to introduction of some intro- or interpersonal threat (related to negative consequences or performance). Excitation items were written to include stimuli including social interactions. This 45-item scale has three factors/scales: excitation (SES), inhibition-1 (SIS1) and inhibitions-2 (SES2). The SIS/SES has strong reliability with alphas for SES ( $\alpha=.89$ ), SIS1 ( $\alpha=.78$ ), and SIS2 ( $\alpha=.69$ ). The SIS/SES has demonstrated convergent and discriminant validity with significant correlations with a number of other valid measures (Janssen et al., 2002).

#### Sexual Addiction Screening Test – Revised (SAST-R)

To restrict the study to heterosexual males suffering from problematic addictive Internet pornography use, the SAST-R scale will be used. The SAST-R Internet scale is a 45-item self-report scale that relates to different problematic cybersex behaviors depending on the gender and sexual orientation of the individual and detects potential cases of sexual addiction. The scale taps into sexual behaviors greatly facilitated by Internet use (fantasy, pornography, trading, and preoccupied isolation). The scale consisting of four subscales which measures the general constructs of sexual addiction: preoccupation, loss of control, relationship disturbance, and affective disturbance. Internal consistency of the scale is strong with  $\alpha= .792$  (Green et al., 2012).

#### Cyber-Pornography Use Inventory (CPUI)

The CPUI scale assesses cybersex behavior among participants. Patterned after the Internet Sex Screening Test, the assessment primary focus is to target areas related to Internet pornography. The measure is designed with attention to addictive behaviors characterized by one's inability to stop the behavior, significant negative effects resulting from the problematic behavior and a general obsession with the behavior (Grubbs et al., 2010). This 40-item scale has

three factors: addictive patterns, guilt regarding online pornography use, and online sexual behavior-social. The CPUI self-report inventory reported strong reliability with alpha reporting: addictive patterns (.89), guilt regarding online pornography use (.83), and online sexual behavior-social (.84) (Grubbs et al., 2010).

### The Acceptance and Action Questionnaire-II (AAQ-II)

This 10-item scale will be used to measure experiential avoidance. Scores on the AAQ-II range from 10-70 with lower scores indicating a higher level of experiential avoidance. The AAQ-II has an internal consistency of  $\alpha=.83$  and test-retest reliability at  $r=.80$  over a three month period (Wetterneck et al., 2012).

### Demographic Questionnaire

This questionnaire will consist of questions asking demographics regarding the participant's age, gender, ethnicity, socioeconomic status, education, occupation, age when pornography was first viewed, religious affiliation, relationship status, and qualifying information: experience of any negative consequences for Internet pornography addiction, longest period viewing Internet pornography at one setting, longest timeframe without viewing pornography, location(s) where pornography is viewed, viewing of pornography alone or with other(s), time thinking about pornography, number of attempts to try to stop or control the behavior, any experiencing of withdrawal symptoms, is the viewing a method of escape, does it interfere with important areas of functioning, consequences of the negative behavior, change in sexual relations with partner, and change in sexual desires.

## DESIGN

This is a one-way between groups analysis of covariance (ANCOVA), pretest/posttest design. The three groups will be randomly assigned to either the intervention, CBT therapy (n = 25), ACT therapy (n = 25), or the wait-list control group (n=25), (total participants, N = 75). Internet pornography addiction is a covariate. The independent variable has three levels: ACT and CBT therapy with the dependent variable being measured are the scores on Internet pornography addiction (CPUI scale). The ANCOVA test is conducted in order to assess any group differences or covariances between treatment and Internet pornography addiction.

## ASSUMPTIONS

Assumptions for the ANCOVA study will be screened to test for violation. Normal distribution (homogeneity) is accounted for by including random assignment to the study's design. Measurement of the covariate's reliability is accounted for by the inclusion of the study's instruments, which will measure the participants Internet pornography addiction. As previously discussed, all measures included in the study have reported high reliability, thus minimizing violation of this assumption. In order to insure that the covariate ( $X_c$ ) is not influenced by the teaching intervention, the study's design has included a pretest and posttest. The pretest will measure the participants' level of Internet pornography addiction. It will be measured prior to the implantation of the treatment, thus not influencing the treatment among the

participants. This test will ensure that the covariate is not influenced by the treatment. To test whether the confounds between the A and  $X_c$  is weak to moderate, the study will include statistical analysis of a one way between subjects ANOVA, which will provide information about any confound between the covariate ( $X_c$ ) and the intervention (A). This test will assess any differences in the outcome variable (Y) means across the intervention (A) groups without the covariate ( $X_c$ ) (Warner, 2008). Lastly, to assess possible treatment by covariate interactions for the covariate, a Generalized Linear Model test will be ran using SPSS program. This will evidence whether there is treatment by the covariate or the A x  $X_c$  interaction. The investigator is expecting that this test will not be statistically significant (Warner, 2008).

## VALIDITY

### Internal Validity

To control for threats to internal validity, the use of a wait-list control group rules out history, maturation, testing, and statistical regression as plausible alternatives for an explanation of results. The use of the wait-list control group allows the researcher to discern whether changes in the treatment conditions were any greater than changes without the treatment. Random assignment of participants controls for selection bias by minimizing difference in group composition (Kazdin, 2003). Instrumentation may be a plausible alternative for changes in participants due to the repeated testing at pretest, posttest, and follow-up.

Due to the length of the study, it is possible for attrition to occur amongst the group members. This is a threat to internal validity as it changes the composition of the groups as it may be a differential loss of subjects between groups or the number of participants could be similar, but the characteristics of the participants who dropped out differ between groups (Kazdin, 2003). Due to the similar nature in the two treatment conditions (ACT and CBT), diffusion/imitation of treatment is also viewed as a plausible alternative for results. Yet, researches have instituted a manual for treatment providers to follow to reduce the possibility of this occurring.

### External Validity

The researcher expects the study to apply to other groups of men, settings and geographical areas. However, external validity is threatened when the study's sample consists of women. Female addiction to Internet pornography is due to their preference for a long-term sexual strategy, resulting in a generally less intense interest in explicit sexual content, such as chat rooms (Corley et al., 2012; Green et al., 2012; Paul & Shim, 2008); or include a different demographic by believing that viewing pornography is normal or a deviant behavior (Beaver & Paul, 2011; Twohig & Crosby, 2010; White & Kimball, 2009). Women are an underrepresented population and have not been extensively studied; especially with regard to Internet pornography as the nature of the addiction is vastly different from that of men.

Reactivity of experimental arrangements, novelty effects are not likely to be a problem for generalizability. Multiple treatment interference is not likely to be a threat to external validity as the researcher has taken precaution to administer a treatment manual to the treatment providers, so they understand the treatment that they are to provide to their treatment group. Test

sensitization may pose as a threat because the study is repeatedly testing participants to assess change in their addiction.

Reactivity of assessment could present to be a problem for external validity; however, the wait-list group would help to minimize this alternative. Timing of measurement is not likely to be a plausible threat to external validity, because the results are also measured again at posttest (week 9) and the three-month follow-up (week 16). Stimulus characteristics and settings also do not pose as a threat to external validity, as the features of the study with which the intervention is administered is not associated with the setting, experimenters, interviewers, or any other factors that may be related to the experimental arrangement.

### Construct Validity

Cues of the experimental situation are not considered to be a threat to construct validity as extraneous cues are not associated with the intervention, which could explain findings. On the other hand, group differences across experimental and control groups may pose as a threat to construct validity, as group members may perceive they are receiving attention from treatment providers as they help group members process content from therapy which would prove to help group members receive breakthrough and understanding in therapy.

However, to alleviate this potential, treatment providers have been instructed via their treatment manual to be systematic with all group members so as to reduce such variance. To examine the basis for the effects of construct validity, the inclusion of the control group who received testing at the same time intervals of the treatment groups helps to minimize the possibility of receiving a threat based on attention and contact with the participants (group members) (Kazdin, 2003). In addition, measures of processes of treatment changes in cognition and behaviors are obtained in the study through the use of the AAQ-II assessment measured at pretest, posttest, and follow-up. However, this may only prove to be beneficial for the group which receives ACT treatment, as it focuses on decreasing experiential avoidance. Participants in the CBT group did not receive an assessment to measure cognitive and behavioral change according to CBT theoretical framework.

Single operations and narrow stimulus sampling may cause to be a potential threat to construct validity, as confound of treatment with therapist can raise ambiguity, thus possibly rendering a change based on the combination of the treatment with a particular therapist. However, the use of two therapists in the study will reduce this plausibility, if results are obtained in both treatment groups, thus showing that replication of similar effects across groups is not due to a particular therapist (Kazdin, 2003).

In addition, the wide range in the ages, socioeconomic status, race, and education widen the range of stimuli and limitations thus applying to both external and construct validity. The generalization across these conditions can influence plausibility. The study's range is not narrow, thus broadening generalizability.

Experimenter expectancies are also a potential threat to construct validity, as the treatment provider's expectancies, beliefs, and desires about the results on how the participants perform could affect changes in-group members. In addition, the unintentional expectancy effects by the treatment providers: change in tone, posture, facial expressions, delivery of instructs, and adherence to prescribed procedures could influence how the participants respond to treatment and the treatment providers. While there are more parsimonious interpretations than expectancies, this still could pose as a threat to construct validity, as it may provide plausible

rival interpretation of the effects otherwise attributed to the experimental manipulation (Kazdin, 2003).

## STATISTICAL CONCLUSION VALIDITY

### Statistical Analysis and Consideration

The recommendation of three groups ( $k = 3$ ) is the alpha level set at .05, the  $df_{\text{between}} = 2$ , and the level of power set at .80, partial eta set at partial  $\eta^2 = .15$ . The number of participants per group to obtain this level of power would be  $n = 19$  (Warner, 2008). Thus the three treatment groups (CBT, ACT and wait-list control group) will need to have a minimum of 19 participants each for a total of  $N = 57$ . This researcher will have  $n = 25$  per each treatment group, for a total of  $N = 75$  participants for the study, in order to obtain reasonably narrow confidence intervals for each estimated group mean, thus increasing chances of detecting an effect between groups means.

A one-way repeated ANCOVA will be used to analyze the covariance between the wait-list control and treatment groups. This design will statistically control (or partial out) the participant characteristics through the use of a pretest. The inclusion of the covariate in the ANCOVA is an effective error variance suppressor and can improve statistical power (Warner, 2008). The within-group design will retest the same participants on each condition of the three-levels of the single independent variable and the outcome variable, thus analyzing pretest-posttest data, reducing error variance due to individual differences among participants, to try to correct for nonequivalence of participant characteristics in the analysis of data from true experiments, and to provide a way to assess whether mean outcome scores differ across treatment groups when the statistical adjustment is made to control for different participant characteristics across groups (Warner, 2008).

Statistical tests to be conducted will include an F-ratio, which will limit the risk of Type I error. It provides a single omnibus test of the hypothesis that the means of all  $k$  populations are equal (Kazdin, 2003). The one-way ANOVA will enable the researcher to see whether  $Y$  differed across levels of the independent variable (CBT, ACT, and wait-list control group). Additional statistical tests will include a Bonferroni-Correction. The study consists of  $k = 3$  different significance tests, in order for the overall 'experiment-wise' risk of Type I error for the entire set of  $k = 3$  to be limited to .05. This allows for a more conservative alpha level and is a drawback of using this test (Warner, 2008). GLM analysis will be conducted to test for possible violation of the assumption that there is no treatment by covariate interaction. Performing a Tukey's HSD test will be conducted for multiple comparisons of differences between means for all possible pairs of means. This will determine whether the CBT, ACT and wait-list control groups will differ significantly. As well, it guards against type I error. If the study is a success, experimental groups will provide the statistical significance by indicating reduced pornography addictive behaviors by the treatment conditions.

### Alpha

Alpha for this study will be set at  $\alpha = .05$ . Alpha is acceptable at this level within social science experiments (Kazdin, 2003). Strong statistical significance is mostly obtained by acquiring a large number of participants (Kazdin, 2003). The minimum requirement of

participants in this experiment is 19 persons per group. However, to increase statistical significance, 25 persons per group will be used. Studies comparing two or more treatments have little power to detect real differences, therefore, the number of participants is increased yet still a sufficient size not to compromise effects of group therapy treatment. This may constitute as a threat to statistical conclusion validity as sample size is small, but relaxing the alpha level is not feasible as it will reduce the probability of incurring a type- II error but increase the probability of incurring a type-I error.

### Power

Power for the study has been set at .80. The relatively small sample size may affect power. While attempts have been made to increase the sample size, researchers are also cognizant of not compromising group treatment content and processing amongst group members. While increasing sample size is the best method to increase power, it is not possible within the confines of this study. In addition, the ANCOVA design will take advantage of the use of a pretest. Researchers are mindful that the use of pretests/repeated measures also reduces the error term in evaluating effect size, thus increasing power (Kazdin, 2003). The use of pretests reduces the threat to statistical conclusion validity as the pretest measure in this ANCOVA study looks at the participants results at post-treatment (thus the covariate), thus recognizing that the effects size error term is altered.

### Effect Size

Effect size for comparison of at least two treatments ranges between .40-.60. Minimal variation will result in evidence of a strong effect size. The levels of the independent variable differ from very high to very low. However, the ACT and CBT treatment are similar in level of treatment. This can possibly limit the ability to show the greatest difference between these groups. Yet, the inclusion of a wait-list control group will give researchers ability to detect any between-group differences after treatment has been completed (Kazdin, 2003). Another measure to minimize threats to statistical conclusion validity is to influence the effect size obtained in the study by reducing variability in the procedures. The inclusion and administration of a treatment manual to the treatment providers limits the treatment providers' variability in treatment, leaving differences attributed to only the type of treatment and not delivery of treatment. As well, since the treatments are of the same theoretical background, there is similarity in procedures and goals.

Plausible threats to statistical conclusion validity include subject heterogeneity. The study is conducted within a metropolitan area where participants may include residents of various surrounding suburbs or residents of the major city; as well, the age difference in the participants (25-45) marks different generations. Other factors to consider are differences in education, socioeconomic status level, race and ethnicity and marital status may vary among participants.

The reliability of the measures has been strong. Although the CPUI measure was intended to measure cybersex behavior among participants, the assessment's primary focus is to target areas related to Internet pornography among religious participants. The measure was designed with attention to address Internet pornography use and addiction within a religious population (Grubbs et al., 2010). This study was not designed with an inclusion or focus on religious participants. Thus statistical conclusion validity may be compromised with an

unreliability of this measure. Due to the limited nature in testing measures, which strictly measures Internet pornography use, this is the only measure included within the study to assess participant's addiction. The reliability and validity of the CPUI measure is strong, thus indicating it is structurally sound and not poorly designed. This study will assess whether it can extend to non-religious populations and participants over age 23.

## CONCLUSION

### Clinical and Social Significance

The Internet has become a staple in the mainstream of communicating whether personally or professionally. It is a required piece of equipment in the work place, school, and home. The very nature of pornography has been established as being addictive (White & Kimball, 2009). For those who are vulnerable to developing addictive behaviors to viewing Internet pornography, the use of the computer is a temptation that is difficult to manage. Therapy is needed to help addicts to overcome its seduction and consumption. Accountability is important: daily accountability, encouragement for success (Laaser & Gregoire, 2003). The addict of Internet pornography has a disadvantage unlike the recovering alcohol or drug addict. While these individuals can avoid bars and drug houses/dealers, the Internet pornography addict needs to become accountable when using the Internet so as not to be swayed by its temptation, once recovery has been in place.

The relevance of this study will provide mental health professionals with substantiated empirical support of the effectiveness and efficacy of CBT and ACT treatment of Internet pornography addicts. Both forms of treatment have similar foundational aspects which center upon changes in thought and emotional processes. However, this study will give further insight as to which treatment is best at reducing Internet pornography addictive behaviors as well as relapse.

Treatment will give the addict the tools and education needed to manage and overcome this addiction. It would prove to prepare therapists to treat Internet pornography as this sexual behavior is on the rise. Due to its growing pandemic, therapists who specialize in this type of addiction will become better equipped to be aware of the addiction, understand the addiction and its vulnerabilities, prioritize the addiction, recognize, and be better equipped to provide recovery services (Jones & Hertlein, 2012; White & Kimball, 2009). Treatment will equip these types of addicts with the needed help to overcome this problematic behavior. The results will not only help the individual but their interpersonal and work relationships. Treatment can address core issues of loneliness, depression, trust, relationship difficulties, anxiety, inadequate relational sexuality development, isolation, maladaptive cognitive schemas and behaviors, experiential avoidance and trauma (Courtois, 2010; Gabbard, 2009; Green et al., 2012; White & Kimball, 2009). Its result can produce healthier individuals mentally and sexually, thus in turn producing healthier societies.

### Limitations

It is important to evidence significant results. Thus the small sample size is a limitation of this study. Greater statistical results become evident when the sample size increases. However, researchers need to be mindful to keep the integrity of treatment for participants

without sacrificing therapy in lieu of statistically significant results. Also, this study only included male participants. While the Internet pornographic materials are mostly viewed by men, women are also vulnerable to becoming addicts as well (Corley et al., 2012). Without compromising testing, it would be helpful to assess changes in cognitions and behaviors as a result of manipulating the independent variable (CBT). This study did not include an assessment to measure that type of change.

### Directions for Future Research

Lastly, although a three-month follow-up enables the investigator to identify lasting effects, it would be beneficial if future research included longitudinal studies, which assessed long term effects or assessed relapse, for whatever reason it occurs. Future studies could compare treatment of Internet pornography addiction to treatment of Alcohol Anonymous and Narcotics Anonymous. Replication of the study to expand generalizability across geographic settings and ethnicities, and the inclusion of women in the study would further substantiate treatment for this addictive behavior so that programs are instituted in communities and agencies across the nation.



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