

DYSREGULATED SEXUALITY, SEXUAL DESIRE AND SEXUAL AROUSAL
REGULATION

by

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Abstract

The studies described in this dissertation examined the relationships among dysregulated sexuality, heightened sexual desire and sexual arousal regulation. Study one addressed the association between dysregulated sexuality, commonly referred to as sexual compulsivity, sexual addiction or sexual impulsivity, and sexual desire. A sample of 14,396 men and women, some of who had sought treatment for sexual compulsivity, addiction or impulsivity, completed an online survey comprised of various sexuality measures. Male and female treatment groups scored significantly higher on dysregulated sexuality and sexual desire, and for all groups, dysregulated sexuality was associated with increased sexual desire. Exploratory factor analysis revealed that in both male and female participants, regardless of treatment status, dysregulated sexuality and sexual desire variables loaded onto a single underlying factor. The final stage of analyses showed that sexual desire can account for the relationship between dysregulated sexuality and risky sexual behavior. The results suggest that dysregulated sexuality, as currently conceptualized, may simply be an indicator of heightened sexual desire and the distress associated with managing a high degree of sexual thoughts, feelings and needs.

The objectives of study two were to examine the effectiveness of emotional reappraisal in regulating male sexual arousal, and to evaluate the relationships between sexual arousal regulation, and sexual desire and dysregulated sexuality. Participants completed a series of online sexuality questionnaires, and were subsequently assessed for their success at regulating sexual arousal in the laboratory. Results showed that the ability to regulate emotion crosses emotional domains; those men best able to regulate

sexual arousal were also the most skilled at regulating their level amusement to humorous stimuli. Participants, on average, were somewhat able to regulate their physiological and cognitive sexual arousal, although there was a wide range of regulation success. While some were very adept at regulating their sexual arousal, others became more sexually aroused while trying to regulate. Age, sexual experience and sexual compulsivity were unrelated to sexual arousal regulation. Conversely, sexual excitation, inhibition and desire correlated with sexual arousal regulation success. Increased sexual excitation and desire were associated with poorer regulatory performance while propensity for sexual inhibition was related to regulatory success.

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Co-authorship Statement

The ideas presented in this dissertation are those of the authour, developed under the supervision of and in consultation with my co-supervisors Kalina Christoff and Boris Gorzalka. The two studies were primarily conceptualized, designed and implemented by the authour. Dr. Gorzalka provided input on various aspects of human sexuality and was responsible for reviewing and editing the manuscripts submitted for publication. Dr. Christoff provided assistance with paradigm development for the laboratory study. Dr. Bruno Zumbo offered his expertise on multivariate statistical analyses, specifically factor analysis.

Chapter 1

An Introduction to Dysregulated Sexuality and Its Relationships to Sexual Desire and Sexual Arousal Regulation

1.1 Introduction

Self-control of sexual behaviours is essential for successful navigation of the social world. Imposed social and legal sanctions dictate the appropriateness of sexual behaviours, the contexts within which they may occur, and the amount of time and resources considered reasonable to devote to those behaviours. Individuals are expected to manage their sexual behaviours within the framework of those sanctions, and if they cannot or do not, there can be serious legal, social and health consequences.

It is assumed that individuals have varying levels of control over their sexuality (i.e., sexual thoughts, feelings and behaviours), with the extreme ends of the spectrum capturing those individuals who are unable to relinquish control and those who have little or no control. As behaviour that falls outside the bounds of cultural norms is often pathologized, particularly when accompanied by distress or detriment to well-being of self or others, it is not surprising that individuals at the opposite ends of the spectrum have drawn the attention of the psychological and psychiatric communities. There is a substantial body of literature dedicated to disorders of overcontrolled sexual response and the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV-TR) includes many of those disorders within its diagnostic system (American Psychiatric Association, 2000). Conversely, the study of dysregulated sexuality, commonly referred to as sexual compulsivity, sexual addiction or sexual impulsivity, has only started to gain

momentum in the last couple of decades. Much confusion surrounds its conceptualization and the way it should be labelled.

One possible contributor to dysregulated sexuality that has not been systematically addressed is sexual arousal dysregulation, or an individual's inability to regulate his or her own sexual arousal. It is not clear if dysregulated sexuality is, in part, a consequence of heightened sexual desire, sexual arousal regulation failure, or some combination of the two. Although there is some impetus to explore the role of sexual arousal dysregulation and its relationships with dysregulated sexuality and heightened sexual desire (Bancroft & Vukadinovic, 2004; Dodge, Reece, Cole, & Sandford, 2004), no empirical examination has yet been undertaken. This investigation represents the first systematic exploration of heightened sexual desire and dysregulated sexual arousal as contributors to dysregulated sexuality.

1.2 Problematic Sexual Behaviours

Much of the literature on dysregulated sexuality has focused upon its relationship with risky sexual behaviours (RSB). Risky sexual behaviours, typically operationalized as including multiple causal partners and a high frequency of unprotected sex (i.e., no condom), are those that increase the chance of exposure to sexually transmitted infections (STI). The study of RSB has been largely motivated by the HIV/AIDS epidemic and its enormous social and economic costs. Because of this, RSB research has predominantly focused on gay males. Much less is known about sexual risk taking in heterosexual populations and no research has specifically addressed RSB in homosexual females.

Given that lesbian sexual relationships do not involve the penetration of one partner with the genitals of the other, unprotected sex may be less risky for gay women.

Dysregulated sexuality is among the variables that have been linked with RSB. It is associated with a greater number of sexual partners in samples of homosexual men (Kalichman & Rompa, 1995; Miner, Coleman, Center, Ross, & Rosser, 2007), men and women seeking treatment at an STI clinic (Kalichman & Cain, 2004), HIV-positive men and women (Kalichman & Rompa, 2001) and people living in high density urban centres (Kalichman & Rompa, 1995). In those studies, as well as a study of female and male college students (Dodge et al., 2004), dysregulated sexuality was also related to higher rates of unprotected sexual intercourse. Dysregulated sexuality is also associated with total number of HIV-positive, HIV-negative or unknown serostatus partners in samples of HIV-positive men and women (Benotsch, Kalichman, & Pinkerton, 2001) and HIV-positive methamphetamine-using gay and bisexual men (Semple, Zians, Grant, & Patterson, 2006). In addition, individuals who score higher on a measure of dysregulated sexuality are more likely to have been diagnosed with STIs (Benotsch et al., 2001; Semple et al., 2006).

Clinicians working in the area report that dysregulated sexuality can also manifest itself in various other ways such as: compulsive masturbation, protracted promiscuity, and phone sex, pornography and/or cyber sex dependence (Anthony & Hollander, 1993; Black, 1998, 2000; Carnes & Adams, 2002; Carnes, 1983; Coleman, 1991, 1992, 2003; Fong, 2006; Gerevich, Truer, Danics, & Herr, 2005; Gold & Heffner, 1998; Goodman, 1992, 1993, 1997; Kafka, 2000a; Kafka & Hennen, 1999; Kafka & Prentky, 1992a; Krafft-Ebbing, 1997, 1999; Leedes, 2007; Mick & Hollander, 2006; Quadland, 1985;

Stein, Black, Shapira, & Spitzer, 2001; Tepper, Owens, Coleman, & Carnes, 2007; Travin, 1995). Typically, individuals seek treatment when dysregulated sexuality begins to cause significant distress, interferes with social or occupational functioning, or at their partners' insistence. Dysregulated sexuality often presents clinically with comorbid psychiatric illnesses, most commonly mood and anxiety disorders (Black, Kehrberg, Flumerfelt, & Schlosser, 1997; Kafka & Prentky, 1992a; Raymond, Coleman, & Miner, 2003). Treatment approaches for dysregulated sexuality include 12-step groups, psychotherapy, psychopharmacotherapy or some combination of the three (Bradford, 2001; Carnes & Adams, 2002; Coleman, 1991, 2003; CompCare, 1987; Fong, 2006; Goodman, 1992, 1993, 1997; Kafka, 1994, 2000b; Kafka & Prentky, 1992b; Quadland, 1985; Tepper et al., 2007).

In the forensic literature, the notion that dysregulated sexuality is associated with sexual offending has only recently been recognized. In their meta-analysis of sexual offender recidivism, Hanson and Morton-Bourgon (2004) found that sexual preoccupations was among the top predictors of sexual reoffence. Also, Kafka (2003) reported that sexual offenders, in particular those diagnosed with paraphilias, are more likely to exhibit dysregulated sexuality. Given these findings, it is likely that the role of dysregulated sexuality in sexual offending will become of more empirical and clinical interest.

1.3 Sexual Desire and Arousal

Everaerd, Laan, Both and Spiering (2001) assert that sexual desire is the “subjective experience of being attracted to or pushed towards objects or behaviours with

potentially rewarding effects” (p. 96). Sexual desire is the hope, need and expectation of sexual reward and satisfaction. In a similar way, Levine (2003) defines sexual desire as “the sum of forces that lean us toward and push us away from sexual behaviour” (p. 280). He suggests that sexual desire evolves over a person’s life cycle. Its intensity changes across the various epochs of a person’s life, typically increasing during adolescence and young adulthood, and then gradually declining beginning in middle age. An individual’s sexual desire usually manifests itself in a consistent or patterned way. For example, someone may be perceived to be very sexy or sexual. Conversely, another individual may not present as sexual whatsoever. The pattern, however, is not entirely rigid. Changes in social, health, or relationship status may affect sexual desire and the way it is expressed.

According to Levine (2003), sexual desire is comprised of three components. Sexual drive is the biologically determined appetite for sexual stimulation or behaviour. Sexual motivation is the psychological component of sexual desire. It is influenced by affective state, interpersonal dynamics (e.g., mutual affection), and social contexts (e.g., length of relationship). Sexual wish, or the cultural aspect of sexual desire, represents rules, meaning and values surrounding sexual expression. It is dictated by external forces but affects sexual expression through sexual motivation. The three components interact to determine sexual behaviour.

Whalen (1966) described sexual arousal as the current state of sexual excitement and described sexual arousability as the rate at which an individual approaches maximum arousal. Sexual arousability is the propensity for sexual arousal given a sufficient source of stimulation (Everaerd et al., 2001) and is likely modulated by a specific underlying neurophysiological mechanism (Bancroft, 1989, 1999). Heightened arousability implies

increased proclivity to respond strongly to sexual stimuli, which in turn should result in greater central and peripheral arousal. Sexual thoughts and an increased sexually appetitive state follow. In this way, sexual desire, sexual arousability and sexual arousal are directly linked.

1.4 Dysregulated Sexuality

A growing body of popular and academic literature has been devoted to elucidating the exact nature of poorly regulated sexuality (Allen & Hollander, 2006; Anthony & Hollander, 1993; Bancroft & Vukadinovic, 2004; Barth & Kinder, 1987; Benotsch, Kalichman, & Kelly, 1999; Benotsch et al., 2001; Black, 1998, 2000; Black et al., 1997; Bradford, 2001; Carnes & Adams, 2002; Carnes, 1983; Coleman, 1986, 1991; Dodge et al., 2004; Fong, 2006; Gailliot & Baumeister, 2007; Gerevich et al., 2005; Giles, 2006; Gold & Heffner, 1998; Kafka, 2000a, 2003; Kafka & Hennen, 1999, 2003; Kalichman & Cain, 2004; Kalichman, Greenberg, & Able, 1997b; Kalichman, Johnson, Adair et al., 1994; Kalichman & Rompa, 1995, 2001; Krafft-Ebbing, 1997, 1999; Langstrom & Hanson, 2006; Leedes, 2007; Levine & Troiden, 1988; Mick & Hollander, 2006; O'Donohue, 2004; Quadland, 1985; Raymond et al., 2003; Reece & Dodge, 2006; Rinehart & McCabe, 1997; Stein et al., 2001; Tepper et al., 2007; Travin, 1995; Wiederman, 2004). A large majority of this work has focused on conceptualizing and labelling the specific pattern of sexual cognitions and behaviours within a clinical framework. Three concepts or labels have been at the centre of an ongoing debate: *sexual compulsivity*; *sexual addiction*; and *sexual impulsivity*. They are often used interchangeably to describe individuals exhibiting dysregulated sexuality, without

consideration of potentially disparate clinical implications. All three have been met with scepticism, and the debate over nosology and nomenclature continues.

Of the three clinical labels assigned to dysregulated sexuality, sexual impulsivity has received the least support. This label was introduced in an effort to align dysregulated sexuality with DSM impulse-control disorders (Barth & Kinder, 1987). According to the DSM (DSM-IV-TR; American Psychiatric Association, 2000), the central feature of impulse-control disorders is a “failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or others...with increased tension or affective arousal before the act” (p. 663). This is not unlike the descriptions of individuals seeking help for undercontrolled and impulsive sexuality. Such individuals appear to repeatedly engage in sexual behaviours that could be detrimental to themselves or the people close to them (Barth & Kinder, 1987; Coleman, 1991, 1992). Also, many report experiencing tension prior to engaging in sexual behaviour, pleasure and relief during the act, and guilt and regret afterwards. As such, Rinehart and McCabe (1997) suggested that conceptualizing dysregulated sexuality as an impulse-control disorder may have considerable merit. However, they noted that no empirical evidence exists to support the idea that individuals exhibiting dysregulated sexuality lack impulse control. In addition, Bancroft and Vukadinovic (2004) stated that sexual impulsivity, although being consistent with DSM criteria for impulse-control disorders, “has little explanatory value beyond inferring a problem of [behavioural] self-control” (p. 225). Perhaps most problematic to the sexual impulsivity conceptualization is that its description does not differentiate it from the experiences of most sexually active individuals. Those individuals are likely to experience tension prior to sexual activity, pleasure and relief

during, and in some instances, guilt and remorse afterwards. Sexual activity can also be detrimental if it results in the transmission of an STI or unwanted pregnancy. Such negative consequences are not necessarily evidence of an impulse control disorder; they can be the result of poor planning, accident or an impulsive decision.

Sexual addiction, as a clinical entity, first became prominent in the 1980s following the publication of Carnes' *Out of the Shadows: Understanding Sexual Addiction* (1983). Since then, the idea that sexual behaviour can be addictive has drawn a considerable amount of both positive and negative attention. Advocates of the sexual addiction concept argue that, for the sex addict, the pleasant feelings associated with sexual behaviour ameliorate internal affective discomfort brought about by anxiety or depression (Carnes, 1983; Goodman, 1992). In this way, the addict becomes dependent on sex's powerful mood-altering effects to regulate affect.

The label sexual addiction implies similarity with the phenomenology of substance dependence. According to Goodman (1992, 1993, 1997), the same disease process lies at the foundation of both sexual addiction and substance dependence. Because of this, he drew parallels between the expression of substance dependence diagnosis, as outlined in the DSM, and sexual addiction.

Despite the apparent similarities between DSM substance dependence criteria and the descriptions provided by Goodman (1992, 1993, 1997) and Carnes (1983), sexual addiction as a construct appears to be of questionable value (Gold & Heffner, 1998). As Moser (1992) noted, a sexually active couple would be diagnosed as sexually addicted based on a DSM model of sexual addiction. Devoting more time to having sex than is intended, sexual preoccupation, impulsive sexual behaviour, a reduction in social and

recreational activities to make time for sex, and restlessness and irritability during periods of sexual inactivity are often typical of a sexually active couple. The diagnosis of sexual addiction, therefore, has dubious clinical validity. In addition, the validity of behavioural addictions, in general, is still being debated (Holden, 2001; Martin & Petry, 2005; Shaffer, LaPlante, LaBrie et al., 2004). Substance abuse alters neurochemistry, leading to tolerance with repeated consumption and withdrawal symptoms upon cessation. Critics of the behavioural addiction model argue that addictive behavioural patterns do not have this physiological effect. Proponents claim that repetitive behavioural patterns can also fundamentally alter neurochemistry in ways that produce tolerance and withdrawal (Shaffer et al., 2004). It is not clear, however, that the physiological changes experienced by so-called behavioural addicts are as powerful and persistent as those seen in individuals with substance dependency. Also, empirical support for the sexual addiction model is lacking. Given these criticisms, conceptualizing dysregulated sexuality as a behavioural addiction disorder may be premature.

In early descriptions of dysregulated sexuality, some suggested that it was best characterized as an obsessive-compulsive type disorder (Coleman, 1986; Quadland, 1985). Not surprisingly, therefore, the label sexual compulsivity, or compulsive sexual behaviour, was introduced. Since then, parallels have been drawn between sexual compulsivity and DSM obsessive-compulsive disorders (OCD; Anthony & Hollander, 1993; Black, 1998; Bradford, 2001; Coleman, 1991, 1992; Coleman, Miner, Ohlerking, & Raymond, 2001; Raymond et al., 2003; Travin, 1995). According to the DSM, OCD is characterized by obsessions (intrusive, uncontrollable thoughts) and/or compulsions (repetitive, uncontrollable behaviour). An individual diagnosed with OCD recognizes that

the obsessions or compulsions are excessive or unreasonable, and often the obsessions or compulsions interfere with normal daily life. Consequently, the individual often experiences significant distress associated with the disturbing and uncontrollable features of his or her illness.

People seeking treatment for sexual compulsivity describe problems that are consistent with the DSM OCD model (Black et al., 1997; Raymond et al., 2003). For example, they often report: (1) spending hours per day obsessing or fantasizing about sexual behaviour; (2) being unable to resist urges to pursue sexual activity; (3) devoting hours per day to sexual activity (e.g., masturbation, internet pornography and pursuing sexual partners); (4) continuing behaviour despite negative legal, social, personal, occupational or health repercussions; (5) experiencing building tension that can only be reduced with sexual activity; and (6) feelings of remorse and guilt after sexual activity. Based on the DSM OCD model, Coleman and colleagues constructed a sexual compulsivity measure, the *Compulsive Sexual Behavior Inventory* (Coleman et al., 2001; Miner et al., 2007). Their measure may prove to have clinical utility, and may provide empirical support for the DSM OCD model of sexual compulsivity, but it has only very recently been validated.

Although sexual compulsivity appears to fit well within the DSM OCD framework, there is one important criterion that distinguishes sexual compulsivity from OCD (Gold & Heffner, 1998). The DSM stipulates that pleasurable activities, such as sexual behaviour, cannot be included in OCD diagnosis (American Psychiatric Association, 1994, 2000). Although Gold and Heffner (1998) have noted that individuals seeking treatment for sexual compulsivity often report engaging in compulsive sexual

behaviours despite the fact that those behaviours produce little pleasure, there is currently no empirical data to support their clinical observations.

The most recent descriptions of sexual compulsivity have moved away from categorical psychiatric diagnoses altogether (Bancroft & Vukadinovic, 2004; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman & Rompa, 2001). As Kalichman and Cain (2004) have stated, sexual compulsivity "...is not synonymous with sexual addiction, hypersexuality, or other clinically defined categories....Rather, we define sexual compulsivity as a propensity to experience sexual disinhibition and under-controlled sexual impulses and behaviours as self-identified by the individuals" (p. 235). The core feature of sexual compulsivity is a distressing preoccupation with meeting sexual needs such that the individual's personal, social and occupational life is negatively affected (Coleman, 1991, 2003; Kalichman & Cain, 2004; Kalichman & Rompa, 2001; Tepper et al., 2007).

To assess sexual compulsivity as so defined, Kalichman and colleagues created a 10-item measure called the *Sexual Compulsivity Scale* (SCS; Kalichman et al., 1994; Kalichman & Rompa, 1995). The items (see Appendix II) appear to capture dysregulated sexuality in general, rather than aligning with the OCD model of sexual compulsivity. The SCS addresses undercontrolled or disrupting sexual cognitions, arousal and behaviour. Not surprisingly, scores on the SCS correlate highly with disinhibited sexual behaviours, including those that increase risk of HIV/AIDS transmission (Benotsch et al., 1999; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman, Greenberg, & Able, 1997a; Kalichman et al., 1997b; Kalichman & Rompa, 2001).

Much of the scepticism surrounding dysregulated sexuality, and its various conceptualizations, has been fuelled by concerns that statistically extreme or disinhibited sexual behaviour, in and of itself, is not a form of pathology (Giles, 2006; Gold & Heffner, 1998; Levine & Troiden, 1988; Wiederman, 2004). As Levin and Troiden (1988) cautioned, “The invention of sexual addiction or compulsion rests on culturally induced perceptions of what constitutes sexual impulse control” (pg. 351). The fear is that individuals who engage in statistically deviant high frequencies of sexual activity will be stigmatized. Because of that concern, a clear distinction has been made between those individuals who exhibit very frequent or disinhibited sexual behaviour and those who report a problematic lack of sexual self-control. Behaviourally, these groups may appear the same; what differentiates individuals who report dysregulated sexuality from those who merely exhibit high levels of sexual desire and activity is the subjective experience of distress related to an inability to regulate sexual thoughts, impulses and behaviours. Despite the costs and risks associated with dysregulated sexuality, such individuals are unable to resist sexual impulses; they lack sexual self-control. The distress associated with irresistible sexual impulses and undercontrolled sexuality, as experienced by the individual, is central to current conceptualizations of dysregulated sexuality.

Bancroft and Vukadinovic (2004) took a more sceptical approach to dysregulated sexuality and its various conceptualizations, cautioning that any single clinical label cannot capture the heterogeneous nature of dysregulated sexuality. They warned that the premature application of labels such as *compulsive* and *addiction* imply explanatory diagnostic value which has yet to be established. Bancroft and Vukadinovic suggested that what is being called sexual compulsivity and sexual addiction is better characterized

as unregulated sexual behaviour that is experienced as being ‘out of control’ by the individual. Help-seeking behaviour is motivated by disruptions in daily life and distress associated with the perceived loss of sexual control. As an alternative to the inadequate, clinically motivated definitions, Bancroft and Vukadinovic suggest that dysregulated sexuality, in part, results from a predisposition towards heightened sexual excitation coupled with a disinhibited sexual response.

Using the dual control model of sexual response (Bancroft, 1999), Bancroft and Vukadinovic (2004) tested their supposition with a sample of 31 members of a Sexual Addicts Anonymous group. In their words, the dual control model “postulates that the occurrence of sexual arousal depends on a balance between sexual excitation and inhibition of sexual response and that individuals vary in their propensity for both excitation and inhibition” (p. 226). A measure based on the dual control model was published in 2002, called the *Sexual Excitation and Sexual Inhibition Scales* (SES/SIS - see Appendix IV; Janssen, Vorst, Finn, & Bancroft, 2002a, 2002b). It consists of three scales, one measuring excitation (SES), one measuring “inhibition in response to threat of performance failure” (i.e., erectile difficulties; SIS1) and the other measuring “inhibition in response to threat of performance consequences” (SIS2; p. 118; Janssen et al., 2002a). Elevated scores on SES suggest a propensity to be easily sexually aroused, while high scores on SIS1 indicate a vulnerability to erectile dysfunction (Bancroft & Janssen, 2000) and low scores on SIS2 indicate sexual disinhibition and correlate with increased sexual risk-taking (Bancroft, Janssen, Carnes, Goodrich, & Long, 2004; Bancroft, Janssen, Strong et al., 2003).

Bancroft and Vukadinovic (2004) found preliminary evidence of lowered sexual response inhibition (SIS2) and increased sexual excitation (SES) in their small and heterogeneous sample of self-identified sex addicts. Sex addicts scored higher than controls on SES but did not significantly differ on SIS1 and SIS2 scores. Scores on SIS2 were lower for subjects whose primary form of sexual acting out was not masturbation (e.g., voyeurism, cruising, etc.; $N = 9$) as compared to compulsive masturbators ($N = 17$) and controls ($N = 339$). Bancroft and Vukadinovic concluded that sexual excitation and inhibition may jointly play important roles in dysregulated sexuality. Although they did not empirically test for it, they reported that many of the sex addicts described being in dissociative-like states when highly aroused or engaging in compulsive sexual activity. Bancroft and Vukadinovic suggested that this psychological state might interfere with self-regulation, thus representing a mechanism by which heightened arousal could contribute to dysregulated sexuality. Equally possible, high levels of dysregulated sexual arousal and resulting behaviour, once out of control, might lead individuals to experience dissociative-like symptoms. Some of the descriptions provided by Bancroft and Vukadinovic support this notion (e.g., "...an overpowering drive...nothing else under consideration"; "When I am sexually aroused, I click out."; "...eyes glazed, numbing...unfeeling...focusing in the pleasure."; p. 228).

Other evidence also suggests that a heightened proclivity for sexual arousal, driven by high sexual desire, may contribute to dysregulated sexuality. *Hypersexuality*, as a clinical construct, was first introduced in the literature during the 1970s (Brotherton, 1974; Orford, 1978). Since then, it has received meagre attention (Kaplan, 1995; Stein et al., 2001) with the exception of work by Kafka and Hennen (Kafka, 1997, 2000a, 2003;

Kafka & Hennen, 1999, 2003). Kafka's focus has been on the relationship between hypersexuality and paraphilic (PA) and paraphilic-related disorders (PRD). Kafka and Hennen define PRD as "socially sanctioned sexual fantasies, urges, and activities that increase in frequency or intensity so as to cause clinically significant distress or impairment in social, occupational, or other important areas of functioning" (p. 308; Kafka & Hennen, 2003). They asserted that PRD may be equivalent to sexual addiction and sexual compulsivity.

Kafka operationalized hypersexuality, or hypersexual desire, as a persistent total sexual outlet (TSO) of seven or more orgasms per week for at least six months, and after age 15 (Kafka, 1997). This was based on the work of Kinsey, Pomeroy and Martin (1948), who found that in the normal population, only three to eight percent of men report a TSO of seven or more. These proportions likely changed somewhat in the following decades although no data are available.

For hypersexual individuals, persistent high frequency sexual behaviour appears to be exhibited in both adolescence and adulthood (Atwood & Gagnon, 1987; Kinsey et al., 1948). Kafka and Hennen (2003) were careful to note that hypersexuality merely represents the high end of the sexual behaviour continuum and is not a pathological condition per se.

Empirical evidence reported by Kafka and Hennen (Kafka, 1997; Kafka & Hennen, 2003) indicates that the large majority of PA and PRD men can be characterized as hypersexual. Kafka (1997) reported that the mean TSO for PRD men was eight and that 72% of the combined PRD and PA sample reported a TSO greater than or equal to seven, for a minimum duration of six months after the age of 15. In a different sample of

PA and PRD men (Kafka & Hennen, 2003), 80.6% of the combined sample reported a hypersexual TSO greater than or equal to seven and 50.4% reported a hypersexual TSO greater than or equal to ten. Of the men seeking treatment for undercontrolled sexual behaviours, men with a TSO of seven or more reported the most sexual preoccupation, implying that elevated sexual behaviour (i.e., hypersexuality), driven by high sexual desire, may be synonymous with dysregulated sexuality. This is not a new idea; for example, Dodge et al. (2004) suggested that sexual compulsivity may represent nothing more than the extreme end of the sexual drive spectrum. Data from studies of safe and risky sexual behaviours using the SCS (Kalichman et al., 1994; Kaplan, 1995) lends partial support to this supposition. Scores on the SCS correlate with number of partners, number of single-occurrence partners (i.e., “one-night stands”), frequency of sexual behaviour, frequency of solo-sexual activity, and risky sexual behaviours (Benotsch et al., 2001; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman et al., 1997b; Kalichman & Rompa, 2001). In other words, the SCS relates to increased sexual activity of all types.

Pharmacological studies employing selective serotonin reuptake inhibitors (SSRIs) provide indirect evidence implicating sexual desire, sexual arousal dysregulation, and obsessive/compulsive features in dysregulated sexuality. Sertraline and fluoxetine hydrochloride have both been used successfully to reduce sexual compulsions and problematic sexual behaviours for paraphilics and non-paraphilics (Bradford, 2001; Emmanuel, Lydiard, & Ballenger, 1991; Greenberg, Bradford, Curry, & O'Rourke, 1996; Kafka, 1994, 2000b; Kafka & Prentky, 1992a; Zohar, Kaplan, & Benjamin, 1994). In those studies, subjects reported reductions in sexual fantasies, urges and behaviours,

particularly those that were problematic - either paraphilic or non-paraphilic. However, it is unclear if the pharmacological benefits were due to reduction in sexual desire, which is an oft-cited SSRI side effect (Meston & Gorzalka, 1992), increased ability to regulate sexual arousal, reductions in the obsessive-compulsive quality of sexual thoughts and feelings, or overall improved mood. SSRI treatment may result in any or all of these effects.

1.5 Voluntary Control of Sexual Arousal

Forensic practitioners working with sexual offenders largely depend upon the penile plethysmograph (PPG) to determine inappropriate sexual preference (i.e., preference for underaged sexual partners and/or sexual violence). Penile plethysmography testing, a measure of penile tumescence, operates on the assumption that the degree of erection is a valid peripheral indicator of level of central sexual arousal (Geer & Head, 1990). By presenting sexual stimuli that vary in content (e.g., age of target and degree of violence), corresponding changes in penile tumescence can be interpreted to indicate sexual preference. Inappropriate sexual preference is a strong predictor of sexual reoffence (Hanson & Morton-Bourgon, 2004) and therefore identifying it is an essential component of comprehensive offender management.

Despite the utility of the PPG, there continues to be concern that it is vulnerable to faking. A small body of research, borne of that concern, indicates that men have some voluntary control over sexual arousal, as assessed using the PPG (Abel, Blanchard, & Barlow, 1981; Adams, Motsinger, McAnulty, & Moore, 1992; Freund, 1963, 1965, 1967; Henson & Rubin, 1971; Laws & Rubin, 1969; Mahoney & Strassberg, 1991; McAnulty

& Adams, 1991; Quinsey & Bergersen, 1976; Quinsey & Carrigan, 1978). Early studies showed that arousal could be suppressed but sample sizes were small and it was possible that men were merely distracting themselves, looking away from the sexual stimuli or closing their eyes (Abel et al., 1981; Freund, 1963, 1965, 1967; Quinsey & Bergersen, 1976; Quinsey & Carrigan, 1978). In later studies, techniques such as embedded signal detection tasks (e.g., button pressing in response to an embedded flashing dot), tests for stimulus content memory, and ongoing descriptions of sexual stimuli during presentation were used to ensure participants were focused on the sexual stimuli (Henson & Rubin, 1971; Laws & Rubin, 1969; Mahoney & Strassberg, 1991; McAnulty & Adams, 1991). This allowed researchers to rule out distraction as a means of suppressing sexual response.

Results from the well-controlled suppression studies indicate that on average, men are able to somewhat regulate their sexual responses. For example, a third of the participants in a study by Mahoney and Strassberg (1991) were able to reduce their arousal by 50% or more, and patterns of arousal significantly differentiated effective from ineffective suppressors. At the end of testing, some participants reported that they tried to remain emotionally detached from the sexual stimuli, and in that way, reduce their sexual responses. In a similar study, McAnulty and Adams (1991) found that participants were able to, on average, suppress 28% of maximum erection. However, there was a wide range of regulation success, with one third of the sample able to suppress penile tumescence altogether, and one third unable to suppress whatsoever. For the suppress trials, participants self-reported twice as much of a reduction in cognitive arousal (50% of maximum) compared to physiological arousal (25% of maximum).

McAnulty and Adams (1991) posited that arousal regulation success was achieved when participants were able to suppress their physiological responses while still experiencing the stimuli as cognitively arousing. The process was described as “emotional distancing” (p. 574).

The evidence from PPG studies indicates that men, on average, have some control over their sexual arousal. There appears to be large variation in men’s suppression abilities, however, ranging from those that can entirely suppress sexual arousal to those that are completely unable. None of the faking studies examined factors differentiating effective from ineffective suppressors. Conceptually, suppression of physiological arousal and arousal regulation as discussed in the previous section seem linked; it may be possible that variability in, and the interaction between, sexual arousability and sexual arousal regulation may account for such differences. Heightened sexual responsivity in combination with an inability to regulate arousal, once sexually excited, would likely make it difficult or impossible to suppress physiological arousal, as measured with the PPG.

1.6 Sexual Arousal and Emotion

Various sexuality researchers and theorists assert that sexual arousal falls within the realm of the emotions (Everaerd, 1988; Everaerd et al., 2001; Frijda, 1986; Geer, Lapour, & Jackson, 1993; Janssen & Everaerd, 1993; Janssen, Everaerd, Spiering, & Janssen, 2000; Lambie & Marcel, 2002; Rosen & Beck, 1988). Others claim that sexual arousal is a motivational impulse (Baumeister & Heatherton, 1996; Hardy, 1964; Singer & Toates, 1987; Whalen, 1966) much like thirst, hunger and aggression (Gross, 1998,

1999). What fundamentally distinguishes sexual arousal from the primary emotions (i.e., happiness, sadness, anger, surprise, fear and disgust) and makes it somewhat difficult to contextualize within the framework of the emotions, are the accompanying physiological changes specific to sexual arousal. Sexual arousal, like the other emotions, may be associated with distinct facial expressions, changes in tone of voice and verbal expression, along with subjective and physiological changes (Gross, 1998). Unlike the primary emotions, sexual arousal is also typically accompanied by physiological indicators of sexual preparedness: erections in men and vaginal lubrication in women. Still, there are many parallels between sexual arousal and the emotions, and a convincing argument has been provided in support of sexual arousal as an emotional response. Importantly, similar regulatory processes appear to be effective in regulating the primary emotions and sexual arousal (Bancroft, 1999; Beaugerard, Levesque, & Bourgouin, 2001; Jackson, Malmstadt, Larson, & Davidson, 2000; Lévesque, Eugène, Joannette et al., 2003; Ochsner, Ray, Cooper et al., 2004).

Drawing largely upon the works of Frijda (1986), Ekman (1984), and Plutchik (1984), Everaerd (1988) provided a comprehensive and compelling argument in support of the notion that sexual arousal is an emotional response. As he noted, emotions have evolved to deal with fundamental life tasks, reproduction certainly being among these. They drive the motivational behaviours that serve essential adaptive functions and they determine the circumstances under which such behaviour occurs. Emotional responses, and ensuing behaviours, result from cognitive interpretation of the surrounding world. Both conscious and subconscious appraisal processes are involved when meaning is assigned to stimuli. In the case of sexual arousal, stimuli are matched to a flexible

cognitive template of what is sexually arousing for the individual, and when a match is made, a hedonic emotional response is elicited. Voluntary control of sexual arousal is possible when an individual can cognitively attend to a sexual stimulus while at the same time, quashing his or her emotional response to it.

A recent review of the literature on the cognitive control of emotion provides support for Everaerd's contention that sexual arousal is an emotional response. Emotions, as defined by Ochsner and Gross (2005), are positive or negative responses to external stimuli and/or internal mental images. They affect changes across experiential, behavioural, peripheral physiological systems (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000) and are distinguishable from moods in that they are elicited by specific objects or triggers. Emotions can be either learned responses to stimuli with acquired emotional value or unlearned responses to stimuli with intrinsic affective properties. Multiple appraisal processes are typically involved to determine the reward value of emotion-inducing stimuli (Scherer, Schorr, & Johnstone, 2001). According to this set of criteria, sexual arousal is an emotional response. It is induced by external sexual stimuli or cognitively generated fantasy, invokes physiological and cognitive changes, is reward-related and results in pleasure.

Based on the argument that sexual arousal is an emotional response, a series of studies have been conducted examining the cognitive processing of sexual stimuli (Conaglen, 2004; Geer & Bellard, 1996; Geer, Judice, & Jackson, 1994; Geer et al., 1993; Geer & Manguno-Mire, 1996; Geer & Melton, 1997; Janssen et al., 2000; Spiering, Everaerd, & Laan, 2004). Evidence has shown that sexual stimuli, like other emotional stimuli, are processed more slowly than non-emotional neutral stimuli. For example,

during lexical decision making tasks, response times are slower for sexual content words than non-emotional words (Geer & Manguno-Mire, 1996; Geer & Melton, 1997). This phenomenon has been labelled Sexual Content Induced Delay (SCID; Geer & Bellard, 1996; Geer et al., 1994). The slowing of responses to sexual stimuli has been interpreted as an indication of deeper semantic processing, typically evident during presentation of other emotionally charged stimuli. Spiering and colleagues (2004) proposed that the SCID effect is evidence of emotional regulatory control. Regulatory control serves an inhibitory function on sexual response, which would unfold otherwise (Everaerd et al., 2001).

Emotion regulation has been gaining increased attention in the literature (e.g., Beauregard, Levesque, & Bourgouin, 2001; Jackson, Malmstadt, Larson, & Davidson, 2000; Lambie & Marcel, 2002; Lévesque, Eugène, Joannette et al., 2003; Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner & Gross, 2005; Ochsner, Ray, Cooper et al., 2004; Parkinson & Totterdell, 1999; Pelletier, Bouthillier, Lévesque et al., 2003; Scherer et al., 2001) , largely driven by the work of Gross (Gross, 1998a, 1998b, 1999, 2002).

According to Gross, emotion regulation is the process by which an individual controls emotional experience and expression. Emotion regulation can occur during processing of emotional cues (evaluation phase) or after emotional response tendencies are activated (modulation). Either way, the emotional response will be altered. Regulation can be conscious or unconscious, and automatic or deliberate. When successful, regulation can affect change across experiential, physiological and behavioural domains.

According to Gross (2002), there are two effective emotion regulation strategies: reappraisal and suppression. Reappraisal involves reframing potentially emotional stimuli

in a non emotional way. This is done by detaching oneself from, or reappraising the meaning of, the emotion eliciting stimulus. A similar regulatory process was described by Lambie and Marcel (2002). They posited that an individual can control his or her emotional response by taking an objective point of view when confronted by an emotion evoking stimulus. Immersion in the stimulus is avoided while second-order awareness is maintained. Because the individual is able to reflect upon the situation by staying objectively detached, the emotional experience that would have otherwise unfolded is instead muted. Suppression, conversely, affects the behavioural expression of the emotion but does not change the emotional experience (Gross, 2002). For example, an individual may experience disappointment when he or she receives an unwanted gift, but may still respond positively to the benefactor. The emotion remains disappointment but the behaviour signifies joy. If that same individual had emotionally reappraised the event instead, he or she may have perceived the gift as a token of friendship. Disappointment about the gift itself would be avoided.

Compared to reappraisal, suppression is more cognitively taxing since the emotion experienced and the resultant behaviour are in opposition. Laboratory studies have shown that both reappraisal (Beauregard et al., 2001; Jackson et al., 2000; Lévesque et al., 2003; Ochsner et al., 2002; Ochsner et al., 2004) and suppression (Colby, Lanzetta, & Kleck, 1977; Gross, 1998a; Gross & Levenson, 1993, 1997) are effective in regulating emotional response. Of the two strategies, though, reappraisal seems to be far more effective in reducing emotional experience.

To date, only one published study has examined the effects of emotional reappraisal on sexual arousal. Using functional magnetic resonance imaging (fMRI),

Beauregard et al. (2001) investigated the neurophysiology underlying emotional regulation of sexual arousal. While in the MRI scanner, subjects viewed erotic and neutral film clips under two instruction sets. For arousal trials, subjects were instructed to respond normally to the sexual stimuli. For inhibition trials, subjects were instructed to imagine themselves as detached observers and distance themselves from the stimuli. Subjects were reminded to stay visually focused on the video stimuli during the entire scanning session. After each trial, subjects self-reported sexual arousal and primary emotions on a scale ranging from 0 (absence of any arousal) to 8 (strongest arousal in one's entire lifetime). Subjects self-reported significantly less sexual arousal during erotic-suppress trials (mean = 2, range = 1 – 4) than during erotic-experience trials (mean = 5, range = 3 – 8; $p < .005$). There were no self-reported differences for other emotions between conditions, for either the erotic or neutral films. Although no physiological measure of sexual arousal was used, the behavioural results suggest that sexual arousal can be regulated using emotional reappraisal. Increased activation in subcortical limbic and prefrontal regions was observed during suppress trials relative to neutral. Brain imaging studies of non-sexual emotion regulation have found similar results (Lévesque et al., 2003; Ochsner et al., 2002; Ochsner et al., 2004), suggesting that sexual arousal regulation, using reappraisal, relies on the same underlying neurophysiology as the regulation of other emotions.

Given that sexual arousal appears to be a type of emotional response, emotional regulation may play an important role in the inhibition of sexual thoughts, feelings and behaviours. Consider the following example: in the social world, people regularly encounter others who they find sexually attractive. For various reasons (social, legal and

otherwise), people are not free to pursue sexual activity with whomever they please, whenever they please. Sexual behaviour must be self-controlled; both emotional reappraisal and suppression are likely to be involved in that process. When an individual encounters a sexually attractive stranger, he or she may fantasize about sexual behaviour with that stranger (i.e., subjective immersion) or may merely note that the stranger is sexually appealing (i.e., objective reappraisal) and then move on. Fantasizing about sexual behaviour would likely increase sexual arousal which would, in turn, fuel more fantasies and sexual arousal would continue to intensify. Once aroused, the individual could suppress behavioural expression, in which case the arousal would possibly subside. Conversely, if the individual did not suppress and a high state of arousal persisted, sexual behaviour would be more likely to follow (either sexual approach behaviour or solo-sexual activity). In the context of dysregulated sexuality, persistent immersion or an inability to maintain objective detachment through reappraisal may explain why some individuals feel that they are unable to control sexual thoughts, feelings and behaviours. Thus sexual arousal dysregulation, as a specific emotional regulation deficit, may play an important role in dysregulated sexuality.

1.7 Summary and Objectives

From the evidence reviewed, it appears that dysregulated sexuality may significantly overlap with high sexual desire (Bancroft & Vukadinovic, 2004; Benotsch et al., 2001; Dodge et al., 2004; Kafka, 2000a; Kafka & Hennen, 1999, 2003; Kalichman & Cain, 2004; Kalichman & Rompa, 2001). Compared to an individual with low or moderate desire, somebody at the very high end of the sexual desire spectrum would

hypothetically be more attuned to sexual stimuli and more likely to become sexually aroused. He or she might spend more time ruminating over unmet sexual needs and obsessing about sexual behaviours than someone with lower sexual desire. A high level of sexual activity, either with a partner or alone, would be expected. Such an individual would, in all probability, score high on a measure of dysregulated sexuality (e.g., the SCS). To date, no research has directly tested the relationship between sexual desire and dysregulated sexuality using validated measures.

It is also possible that dysregulated sexuality is a consequence of dysregulated sexual arousal in conjunction with high sexual desire. Sexual arousal dysregulation would almost certainly co-occur with high sexual desire, although the two are likely different phenomena (Bancroft, 1999). Theoretically, a proclivity for heightened sexual arousability driven by high sexual desire would cause an individual to become easily and often aroused. Unable to regulate that arousal, the individual would continue to be aroused. Persistent high levels of sexual arousal would make it difficult for the individual to focus on normal daily activities. Quite likely, the individual would seek out a means to achieve sexual relief, thus alleviating sexual tension. If the pattern repeated itself in continual close temporal succession, the individual soon would begin to experience a subjective feeling of loss of control over sexual cognitions, feelings and subsequent behaviours. This type of individual would also likely score high on a measure of dysregulated sexuality (e.g., the SCS). These possible roles of high sexual desire and sexual arousal dysregulation in dysregulated sexuality have yet to be empirically addressed in the literature.

Two studies, described in chapters two and three of this dissertation, were designed to examine the relationships among dysregulated sexuality, heightened sexual desire and sexual arousal regulation. Study one addressed the association between heightened sexual desire and dysregulated sexuality. An online survey was created, which included measures of sexual desire and dysregulated sexuality, among other human sexuality questionnaires. Study two tackled the relationships between sexual arousal regulation, and sexual desire and dysregulated sexuality in a sample of men. It was expected that increased sexual desire and dysregulated sexuality would be associated with sexual arousal regulation failure. Male participants, who also completed the online survey, were tested for their ability to regulate self-reported and physiological sexual arousal using emotion reappraisal tactics. Regulation success was correlated with survey measure scores to determine the how sexual arousal regulation related to both sexual desire and dysregulated sexuality.

1.8 References

- Abel, G. G., Blanchard, E. D., & Barlow, D. H. (1981). Measurement of sexual arousal in several paraphilias: The effects of stimulus modality, instructional set and stimulus content on the objective. *Behavior Research and Therapy*, 19(1), 25-33.
- Adams, H. E., Motsinger, P., McAnulty, R. D., & Moore, A. L. (1992). Voluntary control of penile tumescence among homosexual and heterosexual subjects. *Archives of Sexual Behavior*, 21(1), 17-31.
- Allen, A., & Hollander, E. (2006). Sexual compulsions. In E. Hollander & D. J. Stein (Eds.), *Clinical manual of impulse control disorders* (pp. 87-114). Washington, DC: American Psychiatric Publishing.
- American Psychiatric Association. (1994). *The diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: Author.
- American Psychiatric Association. (2000). *The diagnostic and statistical manual of mental disorders (4th ed., text revision)*. Washington, DC: Author.
- Anthony, D. T., & Hollander, E. (1993). Sexual compulsions. In E. Hollander (Ed.), *Obsessive compulsive-related disorders* (pp. 139-150). Washington: American Psychiatric Press, Inc.
- Atwood, J. D., & Gagnon, J. (1987). Masturbatory behavior in college youth. *Journal of Sex Education and Therapy*, 13(2), 35-42.
- Bancroft, J. (1989). *Human sexuality and its problems*. Edinburgh: Churchill Livingstone.
- Bancroft, J. (1999). Central inhibition of sexual response in the male: A theoretical perspective. *Neuroscience and Biobehavioral Reviews*, 23(6), 763-784.

- Bancroft, J., & Janssen, E. (2000). The dual control model of male sexual response: A theoretical approach to centrally mediated erectile dysfunction. *Neuroscience and Biobehavioral Reviews*, 24(5), 571-579.
- Bancroft, J., Janssen, E., Carnes, L., Goodrich, D., & Long, J. S. (2004). Sexual activity and risk taking in young heterosexual men: The relevance of sexual arousability, mood, and sensation seeking. *Journal of Sex Research*, 41(2), 181-192.
- Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003). Sexual risk-taking in gay men: The relevance of sexual arousability, mood, and sensation seeking. *Archives of Sexual Behavior*, 32(6), 555-572.
- Bancroft, J., & Vukadinovic, Z. (2004). Sexual addiction, sexual compulsivity, sexual impulsivity, or what? Toward a theoretical model. *Journal of Sex Research*, 41(3), 225-234.
- Barth, R. J., & Kinder, B. N. (1987). The mislabelling of sexual impulsivity. *Journal of Sex and Marital Therapy*, 13(1), 15-23.
- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, 7(1), 1-15.
- Beauregard, M., Levesque, J., & Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *Journal of Neuroscience*, 21(18), 165RC:161-166.
- Benotsch, E. G., Kalichman, S. C., & Kelly, J. A. (1999). Sexual compulsivity and substance use in HIV seropositive men who have sex with men: Prevalence and predictors of high-risk behaviors. *Addictive Behaviors*, 24(6), 857-868.
- Benotsch, E. G., Kalichman, S. C., & Pinkerton, S. D. (2001). Sexual compulsivity in HIV-positive men and women: Prevalence, predictors, and consequences of high-

- risk behaviors. *Sexual Addiction and Compulsivity: Journal of Treatment and Prevention*, 8(2), 83-99.
- Best, S. J., Krueger, B., Hubbard, C., & Smith, A. (2001). An assessment of the generalizability of internet surveys. *Social Science Computer Review*, 19(2), 131-145.
- Black, D. W. (1998). Compulsive sexual behavior: A review. *Journal of Practical Psychiatry and Behavioral Health*, 4(2), 219-229.
- Black, D. W. (2000). The epidemiology and phenomenology of compulsive sexual behavior. *CNS Spectrums*, 5(2), 26-35.
- Black, D. W., Kehrberg, L. L. D., Flumerfelt, D. L., & Schlosser, S. S. (1997). Characteristics of 36 subjects reporting compulsive sexual behavior. *American Journal of Psychiatry*, 154(2), 243-249.
- Bradford, J. M. W. (2001). The neurobiology, neuropharmacology and pharmacological treatment of the paraphilias and compulsive sexual behavior. *Canadian Journal of Psychiatry*, 46(1), 26-34.
- Brotherton, J. (1974). Effect of oral cyproterone acetate on urinary and serum FSH and LH levels in adult males being treated for hypersexuality. *Journal of Reproduction and Fertility*, 36(1), 177-187.
- Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In R. Lewis & J. M. Haviland-Jones (Eds.), *The handbook of emotion*, 2nd. Edition (pp. 173-191). New York: Guilford Press.
- Carnes, P. J., & Adams, K. M. (Eds.). (2002). *Clinical management of sex addiction*. New York: Brunner/Routledge.

- Carnes, P. J. (1983). *Out of the shadows: Understanding sexual addiction*. Minneapolis, MN: CompCare.
- Colby, C. Z., Lanzetta, J. T., & Kleck, R. E. (1977). Effects of expression of pain on autonomic and pain tolerance responses to subject-controlled pain. *Psychophysiology*, 14(6), 537-540.
- Coleman, E. (1986). Sexual compulsion vs. sexual addiction: The debate continues. *SIECUS Report*, 14(6), 7-11.
- Coleman, E. (1991). Compulsive sexual behavior: New concepts and treatment. *Journal of Psychology and Human Sexuality*, 4(2), 37-52.
- Coleman, E. (1992). Is your patient suffering from compulsive sexual behaviors? *Psychiatric Annals*, 22(6), 320-325.
- Coleman, E. (2003). Compulsive sexual behavior: What to call it, how to treat it? *SIECUS Report*, 31(5), 12-16.
- Coleman, E., Miner, M. H., Ohlerking, F., & Raymond, N. C. (2001). Compulsive Sexual Behavior Inventory: A preliminary study of reliability and validity. *Journal of Sex and Marital Therapy*, 27(4), 325-332.
- CompCare. (1987). *Hope and recovery: A twelve step guide for healing from compulsive sexual behavior*. Minneapolis, MN: Author.
- Conaglen, H. M. (2004). Sexual content induced delay: A reexamination investigating relation to sexual desire. *Archives of Sexual Behavior*, 33(4), 369-367.
- Dodge, B., Reece, M., Cole, S. L., & Sandford, T. G. M. (2004). Sexual compulsivity among heterosexual college students. *Journal of Sex Research*, 41(4), 343-350.

- Ekman, P. (1984). Expression and the nature of emotion. In K. R. Scherer & P. Ekman (Eds.), *Approches to emotion* (pp. 353-364). Hillsdale, NJ: Lawrence Erlbaum.
- Emmanuel, N. P., Lydiard, R. B., & Ballenger, J. C. (1991). Fluoxetine treatment of voyeurism. *American Journal of Psychiatry*, 148(7), 950.
- Everaerd, W. (1989). Commentary on sex research: Sex as an emotion. *Journal of Psychology and Human Sexuality*, 1(2), 3-15.
- Everaerd, W., Laan, E., Both, S., & Spiering, M. (2001). Sexual motivation and desire. In W. Everaerd, E. Laan & S. Both (Eds.), *Sexual appetite, desire and motivation: Energetics of the sexual system* (pp. 95-110). Amsterdam: Royal Netherlands Academy of the Arts and Sciences.
- Fong, T. W. (2006). Understanding and managing compulsive sexual behaviors. *Psychiatry*, 3(11), 51-57.
- Freund, K. (1963). A laboratory method for diagnosing homo- and hetero-erotic interest in the male. *Behavior Research and Therapy*, 1(1), 85-93.
- Freund, K. (1965). Diagnosing heterosexual pedophilia by means of a test for sexual interest. *Behavior Research and Therapy*, 3(4), 229-234.
- Freund, K. (1967). Diagnosing homo- and heterosexuality and erotic age preference by means of psychophysiological test. *Behavior Research and Therapy*, 5(3), 209-228.
- Frijda, N. H. (1986). *The emotions*. New York: Cambridge University Press.
- Gailliot, M. T., & Baumeister, R. F. (2007). Self-regulation and sexual restraint: Dispositionally and temporarily poor self-regulatory abilities contribute to failures

- at restraining sexual behavior. *Personality and Social Psychology Bulletin*, 33(2), 173-186.
- Geer, J. H., & Bellard, H. (1996). Sexual content induced delays in lexical decisions: Gender and context effects. *Archives of Sexual Behavior*, 25(4), 379-395.
- Geer, J. H., & Head, S. (1990). The sexual response system. In J. T. Cacioppo & L. G. Tassinary (Eds.), *Principles of psychophysiology: Physical, social, and inferential elements* (pp. 599-630). New York, NY: Cambridge University Press.
- Geer, J. H., Judice, S., & Jackson, S. (1994). Reading times for erotic material: The pause to reflect. *The Journal of General Psychology*, 121(4), 345-352.
- Geer, J. H., Lapour, K. J., & Jackson, S. R. (1993). The information processing approach to human sexuality. In N. Birbaumer & A. Öhman (Eds.), *The structure of emotion: Psychophysiological, cognitive and clinical aspects* (pp. 139-155). Toronto: Hogrefe & Huber.
- Geer, J. H., & Manguno-Mire, G. M. (1996). Gender differences in cognitive processes in sexuality. *Annual Review of Sex Research*, 7, 211-245.
- Geer, J. H., & Melton, J. S. (1997). Sexual content-induced delay with double-entendre words. *Archives of Sexual Behavior*, 26(3), 295-316.
- Gerevich, J., Truer, T., Danics, Z., & Herr, J. (2005). Diagnostic and psychodynamic aspects of sexual addiction appearing as a non-paraphilic form of compulsive sexual behaviour. *Journal of Substance Abuse*, 10(4), 253-259.
- Giles, J. (2006). No such thing as excessive levels of sexual behavior. *Archives of Sexual Behavior*, 35(6), 641-642.

- Gold, S. N., & Heffner, C. L. (1998). Sexual addiction: Many conceptions, minimal data. *Clinical Psychology Review, 18*(3), 367-381.
- Goodman, A. (1992). Sexual addiction: Designation and treatment. *Journal of Sex and Marital Therapy, 18*(4), 303-314.
- Goodman, A. (1993). Diagnosis and treatment of sexual addiction. *Journal of Sex and Marital Therapy, 19*(3), 225-242.
- Goodman, A. (1997). Sexual addiction: Diagnosis, etiology and treatment. In J. H. Lowenstein, R. B. Millman, P. Ruiz & J. G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 340-354). Baltimore: Williams & Wilkins.
- Greenberg, D. M., Bradford, J. M., Curry, S., & O'Rourke, A. (1996). A comparison of treatment of paraphilias with three serotonin reuptake inhibitors: A retrospective study. *Bulletin of the American Academy of Psychiatry and the Law, 24*(4), 525-532.
- Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*(1), 224-237.
- Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299.
- Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition and Emotion, 13*(5), 551-573.
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology, 39*(3), 281-291.

- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, 64(6), 970-986.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*, 106(1), 95-103.
- Hanson, R. K., & Morton-Bourgon, K. (2004). *Predictors of sexual recidivism: An updated meta-analysis*. Ottawa, Canada: Public Safety and Emergency Preparedness Canada.
- Hardy, K. R. (1964). An appetitional theory of sexual motivation. *Psychological Review*, 71, 1-18.
- Henson, D. E., & Rubin, H. B. (1971). Voluntary control of eroticism. *Journal of Applied Behavior Analysis*, 4(1), 37-44.
- Holden, C. (2001). 'Behavioral' addictions: Do they exist? *Science*, 294(5544), 980-982.
- Jackson, D. C., Malmstadt, J. R., Larson, C. L., & Davidson, R. J. (2000). Suppression and enhancement of emotional responses to unpleasant pictures. *Psychophysiology*, 37(4), 515-522.
- Janssen, E., & Everaerd, W. (1993). Determinants of male sexual arousal. *Annual Review of Sex Research*, 4, 211-245.
- Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research*, 37(1), 8-23.

- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002a). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring sexual inhibition and excitation proneness in men. *Journal of Sex Research*, 39(2), 114-126.
- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002b). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: II. Predicting psychophysiological response patterns. *Journal of Sex Research*, 39(2), 127-132.
- Kafka, M. P. (1994). Sertraline pharmacotherapy for paraphilias and paraphilia-related disorders: An open trial. *Annals of Clinical Psychiatry*, 6(3), 189-195.
- Kafka, M. P. (1997). Hypersexual desire in males: An operational definition and clinical implications for males with paraphilias and paraphilia-related disorders. *Archives of Sexual Behavior*, 26(5), 505-526.
- Kafka, M. P. (2000a). The paraphilia-related disorders: Nonparaphilic hypersexuality and sexual compulsivity/addiction. In S. R. Lieblum & R. C. Rosen (Eds.), *Principles and practice of sex therapy* (3rd ed., Vol., pp. 471-503). New York: Guilford.
- Kafka, M. P. (2000b). Psychopharmacologic treatments for nonparaphilic compulsive sexual behaviors. *CNS Spectrums*, 5, 49-59.
- Kafka, M. P. (2003). Sex offending and sexual appetite: The clinical and theoretical relevance of hypersexual desire. *Journal of Offender Therapy and Comparative Criminology*, 47(4), 439-451.
- Kafka, M. P., & Hennen, J. (1999). The paraphilia-related disorders: An empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. *Journal Of Sex and Marital Therapy*, 25(4), 305-319.

- Kafka, M. P., & Hennen, J. (2003). Hypersexual desire in males: Are males with paraphilias different from males with paraphilia-related disorders? *Sexual Abuse: A Journal of Research and Treatment*, 15(4), 307-321.
- Kafka, M. P., & Prentky, R. (1992a). A comparative study of nonparaphilic sexual addictions and paraphilias in men. *Journal of Clinical Psychiatry*, 53(10), 345-350.
- Kafka, M. P., & Prentky, R. (1992b). Fluoxetine treatment of nonparaphilic sexual addictions and paraphilias in men. *Journal of Clinical Psychiatry*, 53(10), 351–358.
- Kalichman, S. C., & Cain, D. (2004). The relationship between indicators of sexual compulsivity and high risk sexual practices among men and women receiving services from a sexually transmitted infection clinic. *Journal of Sex Research*, 41(3), 235-241.
- Kalichman, S. C., Greenberg, J., & Able, G. G. (1997a). HIV-seropositive men who engage in high-risk sexual behavior: Psychological characteristics and implications for prevention. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Greenberg, J., & Able, G. G. (1997b). Sexual compulsivity among HIV positive men who engage in high-risk sexual behavior with multiple partners: An exploratory study. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Johnson, J. R., Adair, V., Rompa, D., Multhauf, K., & Kelly, J. A. (1994). Sexual sensation seeking: Scale development and predicting AIDS-risk behavior among homosexually active men. *Journal of Personality Assessment*, 62(3), 385-397.

- Kalichman, S. C., & Rompa, D. (1995). Sexual sensation seeking and sexual compulsivity scales: Reliability, validity, and predicting HIV risk behavior. *Journal of Personality Assessment*, 65(3), 586-601.
- Kalichman, S. C., & Rompa, D. (2001). The sexual compulsivity scale: Further development and use with HIV-positive persons. *Journal of Personality Assessment*, 76(3), 379-395.
- Kaplan, H. S. (1995). *The sexual desire disorders: Dysfunctional regulation of sexual motivation*. New York: Brunner/Mazel.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: Saunders.
- Krafft-Ebbing, R. V. (1997). *Psychopathia sexualis* (D. Falls, Trans.). London: Velvet Publications (Original work published 1886-1901).
- Krafft-Ebbing, R. V. (1999). *Psychopathia sexualis* (B. King, Trans.). Burbank: Bloat (Original work published 1886-1901).
- Lambie, J. A., & Marcel, A. J. (2002). Consciousness and the varieties of emotion experience: A theoretical framework. *Psychological Review*, 109(2), 219-259.
- Langstrom, N., & Hanson, K. (2006). High rated of sexual behavior in the general population: Correlates and predictors. *Archives of Sexual Behavior*, 35(1), 37-52.
- Laws, D. R., & Rubin, H. B. (1969). Instructional control of an autonomic sexual response. *Journal of Applied Behavior Analysis*, 2(2), 93-99.
- Leedes, R. (2007). Compulsive or other problematic sexual behavior. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 365-381). Westport, CT: Praeger.

- Lévesque, J., Eugène, F., Joannette, Y., Paquette, V., Mensour, B., Beaudoin, G., et al. (2003). Neural circuitry underlying voluntary suppression of sadness. *Biological Psychiatry*, 53(6), 502-510.
- Levine, M. P., & Troiden, R. R. (1988). The myth of sexual compulsivity. *Journal of Sex Research*, 25(3), 347-363.
- Levine, S. B. (2003). The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*, 32(3), 279-285.
- Mahoney, J. M., & Strassberg, D. S. (1991). Voluntary control of male sexual arousal. *Archives of Sexual Behavior*, 20(1), 1-16.
- Martin, P. R., & Petry, N. M. (2005). Are non-substance-related addictions really addictions? *American Journal on Addictions*, 14(1), 1-7.
- McAnulty, R. D., & Adams, H. E. (1991). Voluntary control of penile tumescence: Effect of an incentive and a signal detection task. *Journal of Sex Research*, 28(4), 557-577.
- Meston, C. M., & Gorzalka, B. B. (1992). Psychoactive drugs and human sexual behavior: The role of serotonergic activity. *Journal of Psychoactive Drugs*, 24(1), 1-40.
- Mick, T. M., & Hollander, E. (2006). Impulsive-compulsive sexual behavior. *CNS Spectrums*, 11(12), 944-955.
- Miner, M. H., Coleman, E., Center, B. A., Ross, M., & Rosser, B. R. S. (2007). The Compulsive Sexual Behavior Inventory: Psychometric properties. *Archives of Sexual Behavior*, 36(4), 579-587.
- Moser, C. (1992). A response to Aviel Goodman's 'sexual addiction: Designation and treatment'. *Journal of Sex and Marital Therapy*, 19(3), 220-224.

- O'Donohue, G. B. (2004). *Sex addiction, sexual compulsivity, and sexual impulsivity: A model for improving diagnosis and treatment of out-of-control sexual behaviors*. Fielding Graduate Institute.
- Ochsner, K. N., Bunge, S. A., Gross, J. J., & Gabrieli, J. D. E. (2002). Rethinking feelings: An fMRI study of the cognitive regulation of emotion. *Journal of Cognitive Neurosciences*, 14(8), 1215-1229.
- Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, 9(5), 242-249.
- Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D. E., et al. (2004). For better or for worse: Neural systems supporting the cognitive down- and up-regulation of negative emotions. *Neuroimage*, 23(2), 483-499.
- Orford, J. (1978). Hypersexuality: Implications for a theory of dependence. *British Journal of Addiction*, 73(3), 299-310.
- Parkinson, B., & Totterdell, P. (1999). Classifying affect-regulation strategies. *Cognition and Emotion*, 13(3), 277-303.
- Pelletier, M., Bouthillier, A., Lévesque, J., Carrier, S., Breault, C., Paquette, V., et al. (2003). Separate neural circuits for primary emotions? Brain activity during self-induced sadness and happiness in professional actors. *Neuroreport*, 14(8), 1111-1116.
- Plutchik, R. (1984). Emotions: A general psychoevolutionary approach. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion*. Hillsdale: Lawrence Erlbaum Associates.

- Quadland, M. C. (1985). Compulsive sexual behavior: Definition of a problem and an approach to treatment. *Journal of Sex and Marital Therapy*, 11(2), 121-132.
- Quinsey, V. L., & Bergersen, S. G. (1976). Instructional control of penile circumference in assessments of sexual preference. *Behavior Therapy*, 7(4), 489-493.
- Quinsey, V. L., & Carrigan, W. F. (1978). Penile responses to visual stimuli: Instructional control with and without auditory sexual fantasy correlates. *Criminal Justice and Behavior*, 5(4), 333-341.
- Raymond, N. C., Coleman, E., & Miner, M. H. (2003). Psychiatric comorbidity and compulsive/impulsive traits in compulsive sexual behavior. *Comprehensive Psychiatry*, 44(5), 370-380.
- Reece, M., & Dodge, B. M. (2006). Sexual compulsivity: Issues and challenges. In R. D. McAnulty & M. M. Burnette (Eds.), *Sex and sexuality; vol. 2: Sexual function and dysfunction* (pp. 213-231). Westport, CT: Praeger.
- Reynolds, R. A., Woods, R., & Baker, J. D. (Eds.). (2007). *Handbook of research on electronic surveys and measurements*. Hershey, PA: Idea Group Reference.
- Rinehart, N. L., & McCabe, M. P. (1997). Hypersexuality: Psychopathology or normal variant of sexuality? *Sexual and Marital Therapy*, 12(1), 45-60.
- Rosen, R. C., & Beck, J. G. (1988). *Patterns of sexual arousal*. New York: Guilford Press.
- Scherer, K. R., Schorr, A., & Johnstone, T. (2001). *Appraisal processes in emotion: Theory, methods and research*. Oxford: Oxford University Press.

- Semple, S. J., Zians, J., Grant, I., & Patterson, T. L. (2006). Sexual compulsivity in a sample of HIV-positive methamphetamine-using gay and bisexual men. *AIDS and Behavior, 10*(5), 587-598.
- Shaffer, H. J., LaPlante, D. A., LaBrie, R. A., Kidman, R. C., Donato, A. N., & Stanton, M. V. (2004). Toward a syndrome model of addiction: Multiple expressions, common etiology. *Harvard Review of Psychiatry, 12*(6), 367 - 374.
- Singer, B., & Toates, F. M. (1987). Sexual motivation. *Journal of Sex Research, 23*(4), 481-501.
- Spiering, M., Everaerd, W., & Laan, E. (2004). Conscious processing of sexual information: Mechanisms of appraisal. *Archives of Sexual Behavior, 33*(4), 369-380.
- Stein, D. J., Black, D. W., Shapira, N. A., & Spitzer, R. L. (2001). Hypersexual disorder and preoccupation with internet pornography. *American Journal of Psychiatry, 158*(10), 1590-1594.
- Tepper, M. S., Owens, A. F., Coleman, E., & Carnes, P. (2007). Current controversies in sexual health: Sexual addiction and compulsion. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 349-363). Westport, CT: Praeger/Greenwood.
- Toates, F. (1986). *Motivational systems*. Cambridge: Cambridge University Press.
- Travin, S. (1995). Compulsive sexual behaviors. *The Psychiatric Clinics of North America, 18*(1), 155-169.
- Whalen, R. E. (1966). Sexual motivation. *Psychological Review, 73*(2), 151-163.

- Wiederman, M. W. (2004). Self-control and sexual behavior. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory and application* (pp. 525-536). New York: Guilford Press.
- Zohar, J., Kaplan, Z., & Benjamin, J. (1994). Compulsive exhibitionism successfully treated with fluvoxamine: A controlled case study. *Journal of Clinical Psychiatry*, 55(3), 86-88.

Chapter 2

Dysregulated sexuality and heightened sexual desire: Distinct constructs? ¹

2.1 Introduction

Dysregulated, or out of control, sexuality (i.e., sexual thoughts, feelings and behaviours) is increasingly gaining attention in both popular and academic literature. Interest has risen substantially, as it has been implicated in sexual offending (Bradford, 2001; Kafka, 2003) and the spread of sexually transmitted infections – in particular HIV/AIDS (Benotsch, Kalichman, & Kelly, 1999; Benotsch, Kalichman, & Pinkerton, 2001; Dodge, Reece, Cole, & Sandford, 2004; Kalichman & Cain, 2004; Kalichman, Greenberg, & Able, 1997a; Kalichman, Greenberg, & Able, 1997b; Semple, Zians, Grant, & Patterson, 2006). In addition, clinician reports indicate that a significant number of individuals are seeking treatment for the distress associated with the difficulty of managing their sexual thoughts, feelings and behaviours (Anthony & Hollander, 1993; Black, 1998, 2000; Carnes, 1983; Coleman, 1991, 1992; Gold & Heffner, 1998; Goodman, 1992; Kafka, 1997, 2000; Kaplan, 1995; Leedes, 2007; Mick & Hollander, 2006; Raymond, Coleman, & Miner, 2003; Stein, Black, Shapira, & Spitzer, 2001; Tepper, Owens, Coleman, & Carnes, 2007; Travin, 1995; Wiederman, 2004). Although disorders of overcontrolled sexuality are now well established and officially recognized in the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV-TR; American Psychiatric Association, 2000), the exact nature of undercontrolled

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sexuality is still not fully understood. At the centre of an ongoing debate is the way the phenomenon should be conceptualized and labelled, if at all. Despite the lack of clarity in nosology, nomenclature and etiology, there is some interest in seeing dysregulated sexuality recognized as a distinct disorder in the upcoming fifth edition of the DSM.

Two fundamental issues regarding dysregulated sexuality have yet to be settled. First, clinicians and researchers have approached the phenomenon from different clinical traditions. This has resulted in three conceptualizations, with corresponding labels: *sexual compulsivity*, *sexual addiction* and *sexual impulsivity*. These have often been used interchangeably to describe a single set of symptoms, without consideration of potentially disparate clinical implications. A concerted effort has been made to reconcile the three perspectives; however, that literature is largely based on clinical practice and theory, and not empirical study (Barth & Kinder, 1987; Black, 1998; Carnes, 1983; Coleman, 1986, 2003; Gold & Heffner, 1998; Mick & Hollander, 2006; O'Donohue, 2004; Tepper et al., 2007). It is likely that dysregulated sexuality has multiple underlying etiologies and therefore each clinical perspective may offer some explanatory value (Bancroft & Vukadinovic, 2004).

Of the three perspectives, sexual impulsivity, which was introduced in attempt to align dysregulated sexuality with other DSM impulse control disorders (Barth & Kinder, 1987), has received the least support. Sexual impulsivity, as it has been conceptualized, fails to differentiate disordered thoughts and behaviour from that which is expected of many sexually active individuals. Tension preceding sexual activity, pleasure and relief during, and guilt or remorse afterwards may all accompany a sexual experience. Additionally, sexual activity may be detrimental should it result in the transmission of a

sexually transmitted disease or an unwanted pregnancy. Such outcomes may be the result of poor planning, accident or an impulsive decision but are not necessarily indicative of an impulse control disorder. Also problematic, as pointed out by Bancroft and Vukadinovic (2004), is that sexual impulsivity “has little explanatory value beyond inferring a problem of [behavioural] self-control” (p. 225).

Sexual addiction, as a clinical entity, has drawn a considerable amount of attention, largely from clinicians who subscribe to the 12-step addiction treatment model. Advocates of the concept argue that sexual behaviour, for the sex addict, provides feelings of pleasure that assuage internal affective discomfort (Carnes, 1983; Goodman, 1992). Sex becomes a powerful mood-altering experience, relieving the individual from feelings of anxiety or depression, and sex addicts become dependent on sexual behaviour to regulate affect. Goodman (1992, 1993, 1997) suggested that the same disease process underlies both sexual and substance addiction, describing sexual addiction within the pre-existing structure of DSM substance dependency diagnosis. Like sexual impulsivity, however, sexual addiction, as a construct, may be of dubious value (Gold & Heffner, 1998). Moser (1993) argued that a DSM-based model of sexual addiction is faulty because a sexually active couple could be diagnosed as sexually addicted. Failure to resist sexual impulses, sexual preoccupation, spending more time having sex than is intended, reduction in social and recreational activities to make time for sex, and irritability and restlessness during periods of little sexual activity can all be characteristic of a sexually active couple. As yet, there is no empirical support for the sexual addiction model. Further, the legitimacy of behavioural addictions, in general, is still being debated (e.g., Holden, 2001; Martin & Petry, 2005; Shaffer, LaPlante, LaBrie et al., 2004). With these

criticisms in mind, conceptualizing dysregulated sexuality as a behavioural addiction disorder may be premature.

Current consensus indicates that sexual compulsivity, also referred to as compulsive sexual behaviour, may be the best way to conceptualize most cases of dysregulated sexuality. Sexual compulsivity is characterized by sexual thoughts, fantasies and desires that are intense, recurrent, distressing and interfere with daily functioning (Coleman, 1991, 2003; Tepper et al., 2007). Related sexual behaviour is experienced by the sexually compulsive individual to be excessive and out of control. Preoccupation with meeting one's sexual needs may culminate in repetitive or rigid behaviours, negatively affecting the individual's personal, social and occupational life (Kalichman & Cain, 2004). Kalichman and Cain (2004) describe sexual compulsivity as "a propensity to experience sexual disinhibition and under-controlled sexual impulses and behaviours as self-identified by the individuals" (p. 235). They are careful to avoid characterizing sexual compulsivity as a clinical disorder, despite the fact that sexual compulsivity was originally conceptualized to parallel DSM obsessive-compulsive disorders (Anthony & Hollander, 1993; Black, 1998; Bradford, 2001; Coleman, 1991, 1992; Coleman, Miner, Ohlerking, & Raymond, 2001; Raymond et al., 2003; Travin, 1995). Research has shown that sexual compulsivity is associated with those sexual behaviours that are considered most risky (e.g. multiple partners and unprotected sex; Dodge et al., 2004; Kalichman, Johnson, Adair et al., 1994; Kalichman & Rompa, 1995, 2001).

The second fundamental issue surrounding dysregulated sexuality that needs to be addressed is the nature of the association between dysregulated sexuality and sexual desire. Sexual desire is best understood and defined within the framework of Levine's

multidimensional model (Levine, 1987, 2003). According to Levine, sexual desire consists of three components: (1) biological-based sexual drive; (2) motivation, or the psychological aspect; and (3) sexual wish, dictated by socio-cultural context. Elevated sexual desire and resulting sexual thoughts, feelings and behaviours, in the context of current social and cultural standards, have not been sufficiently differentiated from dysregulated sexuality. It may be that the concept of dysregulated sexuality merely captures the high end of the sexual desire spectrum (Dodge et al., 2004) and the socially proscribed negative judgement that often accompanies uncontrolled expression of that desire. Because of this, dysregulated sexuality, as a clinical disorder, has been met with substantial scepticism. It was the goal of our study to address this second issue and in so doing, elucidate the relationship between dysregulated sexuality and elevated sexual desire.

Based on previous evidence, it seems likely that substantially heightened sexual desire may be related to dysregulated sexuality. Kafka proposed that dysregulated sexuality manifests itself as paraphilias (PA) and paraphilia-related disorders (PRD; Kafka, 2000). He and Hennen define PRD as “socially sanctioned sexual fantasies, urges, and activities that increase in frequency or intensity so as to cause clinically significant distress or impairment in social, occupational, or other important areas of functioning” (p. 308; Kafka & Hennen, 2003). They suggested that PRD may be synonymous with other conceptualizations of dysregulated sexuality such as sexual addiction and sexual compulsivity. Citing the work of Kinsey, Pomeroy and Martin (1948), Kafka operationally defined hypersexual desire, or *hypersexuality*, as a persistent total sexual outlet (TSO) of seven or more orgasms per week for at least six months, and after age 15

(Kafka, 1997). A TSO of seven was chosen based on evidence that in the general population, sexually appetitive behaviours occur on a continuum and only three to eight percent of men report a TSO of seven or more (Kinsey et al., 1948). Empirical evidence reported by Kafka and Hennen (Kafka, 1997; Kafka & Hennen, 2003) indicates that the large majority of PA and PRD men can be characterized as hypersexual.

Others have also reported a possible link between dysregulated sexuality and heightened sexual desire. Bancroft and Vukadinovic (2004) found preliminary evidence of significantly increased sexual excitation and lowered sexual response inhibition in a small and heterogeneous sample of self-identified sex addicts. A small body of research on risky sexual behaviour (RSB), or sexual behaviours that increase risk of exposure to sexually transmitted infections (STI), has shown that sexual compulsivity is related to number of partners, number of single-occurrence partners (i.e., “one-night stands”) and frequency of unprotected sex (Benotsch et al., 2001; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman et al., 1997a; Kalichman et al., 1997b; Kalichman & Rompa, 2001; Semple et al., 2006). Sexual compulsivity also correlates with frequency of non risky partnered sexual behaviour and frequency of solitary sexual activity. In other words, sexual compulsivity seems to be related to increased sexual activity of all types, not just those that are risky. Dodge and colleagues (2004) note that sexual compulsivity may represent nothing more than the extreme end of the sexual desire spectrum. To the best of our knowledge, no attempt has been made to differentiate dysregulated sexuality, in any of its conceptualizations, from elevated sexual desire.

Based on previous evidence suggesting heightened sexual desire may not be distinguishable from dysregulated sexuality, and using the sexual compulsivity model of dysregulated sexuality, we formulated the following hypotheses:

1. Individuals who have sought treatment for sexual compulsivity, addiction and impulsivity compared to those that have not, will score significantly higher on a measure of sexual compulsivity. However, they will also score higher on measures of sexual desire.
2. Sexual compulsivity will positively correlate with measures of sexual desire. The pattern of correlations observed will be the same for men and women, and for individuals who have sought treatment for sexual compulsivity, addiction and impulsivity.
3. Exploratory factor analysis, including sexual compulsivity and desire variables, will reveal a one factor solution, reflecting a single underlying construct.
4. Sexual compulsivity will not correlate more strongly with risky sexual behaviours than will measures of sexual desire, and sexual desire will account for the relationship between sexual compulsivity and risky sexual behaviours.

To address our hypotheses, we designed a comprehensive internet-based survey comprised of a battery of human sexuality measures. New internet-based survey technology makes it possible to collect data from large and geographically diverse samples at relatively low cost (Best, Krueger, Hubbard, & Smith, 2001; Reynolds, Woods, & Baker, 2007). Web based versions of traditional pencil-and-paper measures appear to perform equivalently, and validity is maintained (Dixon & Turner, 2007; Meyerson & Tryon, 2003; Roberts, 2007). That said, we are cognizant that internet

survey samples are not typically representative, and therefore generalizing findings to the population is to be done with caution.

Our goal during construction of the online survey was to include a sufficient set of appropriate self-report measures to address our hypotheses, while maintaining a feasible survey length. Among the measures, we included several questionnaires that either directly or indirectly assessed sexual desire. These covered all four domains in which sexual desire could manifest itself: sexual thoughts, feelings and behaviours, and physiological sexual response. We also included a measure of socially desirable responding. Not surprisingly, given the private nature of human sexuality, there is some evidence that social desirability may be related to reduced disclosure on sexuality self-report measures (Meston, Heiman, Trapnell, & Paulhus, 1998). Meston et al. (1998) found that impression management, in particular, negatively correlated with various aspects of self-reported sexuality for both men and women. With this finding in mind, we wanted to insure that socially desirable responding was neither elevated in our sample nor related to underreporting on the sexuality measures.

2.2 Method

2.2.1 Procedure

Various tactics were used to recruit participants. Locally, advertisements with pull tabs were posted around the University of British Columbia (UBC) campus and the Greater Vancouver Regional District. The study was also advertised on the UBC Department of Psychology Subject Pool Psychology Research Participation System. To capture a more geographically varied sample, web based communication and advertising

were utilized. Study advertisements were distributed through email lists and via email ‘snowballing’. In addition, advertisements were posted on various web pages, forums, blogs and social networking sites. The study URL and a brief study description were also published in parts of Europe and Asia, and across much of North America, in the syndicated newspaper sex advice column *Savage Love*.

The online survey, which was approved by the UBC Behavioural Research Ethics Board (BREB), took approximately 45 minutes to complete. To encourage participation, the advertisements and online consent form explained that participants would be provided with their scores once they completed the final survey questionnaire. Updated study averages and means from past research were also provided for comparison, as well as brief descriptions of the measures and the meaning of the scores. Eligible UBC psychology undergraduate students also received one course credit for participating.

The survey included: an online consent form, a demographics and general information questionnaire, 6 sexuality measures, a measure of socially desirable responding, and a results and debriefing page. Other than the Demographics and General Information Form (DGIF) which always appeared first, the order of the measures was randomized. Data were saved upon completion of each measure which insured that partial data were available for those participants who did not complete the entire survey. The survey was posted online in November of 2006 and data collection continued until August, 2007.

The online consent form ‘accept’ button was clicked 21,000 times. A total of 16,462 unique subject numbers were assigned to participants who completed the DGIF. A team of research assistants scrutinized the survey data for repeat entries and invalid

responses; 306 (1.8%) cases were removed. Responses were considered invalid if the software made errors when saving. Despite the inclusionary criteria outlined in the online consent form indicating that participants must be at least 18 years old, 162 (1.0%) underage individuals participated. Their data were excluded from analyses due to BREB policies. Also, data from 87 (0.5%) participants who indicated that their sex was 'other' were also excluded as none of the survey questionnaires had been validated for that population. Another 963 (5.5%) cases were then removed for participants who did not proceed through any measures after completing the DGIF. Since most of the variables used in data analysis captured sexual thoughts, feelings and behaviours related to partnered sexual activity, the data from 548 (3.3%) participants who reported no history of any partnered sexual activity, and whose data still remained, were removed. The final sample size was 14,396. Of these participants, 11,219 (77.9%) completed all survey questionnaires.

2.2.2 Measures

2.2.2.1 Demographics and General Information Form (DGIF). The DGIF was adapted from measures used in online sexuality studies at Indiana University's Kinsey Institute (<http://www.kinseyinstitute.org/research/surveylinks.html>). It consists of 22 items which cover general demographics (e.g. age, ethnicity, language, location, birthplace, education, socio economic status and religion) as well as some basic sexuality variables. Those variables include: sexual identity, target of sexual attraction, sexual experience with men and women, sexual preference, sex of current partner, sexual relationship type (exclusive, non-exclusive and no sexual relationship), marital status,

length of current relationship, and treatment for sexual compulsivity, addiction or impulsivity.

2.2.2.2 Sexual Compulsivity Scale (SCS). The SCS (Kalichman et al., 1994; Kalichman & Rompa, 1995, 2001) is a measure of sexual preoccupation and difficulty managing sexual thoughts and behaviours. In designing a measure to assess sexual compulsivity, Kalichman and colleagues adapted items from a self-help guide used by self-identified sex addicts (CompCare, 1987). The SCS is psychometrically sound and is the only measure of sexual compulsivity that has been both well validated and widely used. The items can be found in Table 2.1. Responses for each of the 10 SCS items range from 1 (*not at all like me*) to 4 (*very much like me*). To score the SCS, responses for the 10 item are summed and then divided by 10. The SCS has good internal consistency with alpha coefficients ranging from .82 – .95 (Dodge et al., 2004; Kalichman et al., 1994; Kalichman & Rompa, 1995, 2001). The SCS also appears to have good concurrent and discriminant validity.

2.2.2.3 Sexual Excitation /Sexual Inhibition Scales (SES/SIS). The SES/SIS (Janssen, Vorst, Finn, & Bancroft, 2002a, 2002b) is a 45-item measure that assesses the strength of the sexual excitation and inhibition systems. Janssen, Bancroft and colleagues created items describing situations that would increase sexual arousal and penile response, or that were sexually threatening, and tested them on a sample of 408 male undergraduates. Principal axis factor extraction and varimax rotation revealed a 45-item 10 factor solution with three higher level factors. The three higher level factors were labelled: (1) propensity for sexual excitation (SES; range 20 – 80); (b) propensity for sexual inhibition due to threat of performance failure (SIS1; range 14 – 56);

Table 2.1 The Sexual Compulsivity Scale (Kalichman & Rompa, 1995)

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

and propensity for sexual inhibition due to threat of performance consequences (SIS2; range 11 – 44). Internal consistency for the three subscales is good (Cronbach's alphas = .88, .82, and .66). Responses for each item range from 1 (*strongly agree*) to 4 (*strongly disagree*). During analysis, all items are reversed such that 1 becomes *strongly disagree* and 4 becomes *strongly agree*. Scores on the SES/SIS appear to be normally distributed in men (so far, approximately 2,500 have been tested; Bancroft & Vukadinovic, 2004) and test-retest reliability coefficients for the three scales indicate that scores are stable over time (Janssen et al., 2002a).

Recently, a female version of the SES/SIS was validated with a sample of 1,067 undergraduate women (Carpenter, Janssen, Graham, Vorst, & Wicherts, in press). The measure is based heavily on the male version, with items reworded to reflect female physiology and sexual response. Although men and women score differently on their respective SES/SIS scales, the overall factor structure appears to be similar. The female version has similar convergent and discriminant validity, and test-retest reliability to the male version.

During analysis, we only included scores from the SES and SIS2 scales as inhibition due to fear of performance failure, as captured by SIS1, is related to sexual dysfunction and not theoretically linked with dysregulated sexuality.

2.2.2.4 Sexual Desire Inventory-2 (SDI-2). The SDI-2 (Spector, Carey, & Steinberg, 1996) is a 14-item test of interest in sexual activity. To create the SDI, twenty sexual desire items were piloted on a sample of 197 female and 117 male undergraduate students. The results of Maximum Likelihood Exploratory Factor Analysis indicated a weak four factor structure: general sexual desire, masturbation, erotica and attraction.

Single item analysis showed that responses to some items were significantly skewed. Because of this, the scale was revised. The revised 14-item version was tested on a sample of 249 female and 131 male undergraduates. Factor analysis revealed a two-factor structure: dyadic sexual desire (SDI2-DSD) and solitary sexual desire (SDI2-SSD). Cronbach's alphas for the two factors are .86 and .96, respectively.

2.2.2.5 The Sexual Outlet Inventory (SOI). The SOI (Kafka, 1994, 1997; Kafka & Prentky, 1992a, 1992b) measures incidence and frequency of sexual behaviours, fantasies and urges. The questionnaire consists of 15 items that make up four components: sexual behaviours, total sexual outlet (TSO), sexual desire and average amount of time per day devoted to sexual behaviours, fantasies or urges. With exception of the three TSO items, the SOI was a redundant measure for the purposes of our study and therefore all other items were excluded. The first of the TSO items assesses average number of orgasms experienced per week during the six months preceding testing. The second TSO item measures average number of orgasms prevented, both voluntarily and otherwise, during the same time period. The third TSO item measures lifetime maximum TSO per week since the age of 15. As we were interested in current sexual behaviours and not in prevented orgasms or lifetime maximum TSO, we chose only to include the first TSO item. Kafka claims that TSO is an indicator of sexual desire and that a TSO of seven or more is indicative of hypersexuality (Kafka, 1997).

2.2.2.6 Survey of Sexual Behaviours (SSB). The SSB was adapted from the sexual behaviours survey used by Dodge et al. (Dodge et al., 2004). The survey consisted of 11 items which addressed solitary sexual activity, and risky and non risky partnered sexual activity (oral, vaginal and anal intercourse), over the preceding three

months. Hours spent viewing or reading pornography per week, on average, and weekly average frequency of masturbation made up the two solitary sexual activity items. The risky sexual behaviour (RSB) items measured number of partners and frequency of unprotected sex for each partnered sexual activity. Unprotected sex (i.e., no condom) is considered risky as it carries increased risk of STI transmission. Two RSB scores were created: summed number of partners across the three types of partnered sexual activity (oral, vaginal and anal intercourse) and summed total incidence of unprotected vaginal and anal intercourse.

2.2.2.7 Derogatis Sexual Functioning Inventory (DSFI). The DSFI (Derogatis & Melisaratos, 1979) is a multidimensional self report measure of current sexual functioning. The DSFI was originally created and validated as a tool for clinicians, although it has also been widely used in research. It consists of 10 subtests, some with multiple components, representing 10 domains of sexual functioning: information, experience, drive, attitudes, psychological symptoms, affects, gender role definition, fantasy, body image and sexual satisfaction. Detailed reliability and validity information is provided in the original 1979 publication. To address our hypotheses, we used four of the DSFI sub tests: drive, psychological symptoms, affects and satisfaction. Internal consistency for each of the chosen four scales is good, with Cronbach's alphas ranging from .60 to .90 (Derogatis & Melisaratos, 1979).

The sexual drive subtest is made up of seven items. The first four items address frequency of intercourse, masturbation, fantasies, and kissing and petting. They can be summed to produce a rudimentary index of sexual drive. The other three items assess ideal frequency of intercourse, age of first sexual interest and age of first sexual

intercourse. Because other survey measures and items either capture sexual drive better or measure current level of sexual activity, the first four items of the sexual drive subtest were not included in analyses. Two of the last three items (ideal frequency of sexual intercourse and age of first sexual interest) contributed unique information about sexual desire and were therefore included.

General psychopathology is captured by the psychological symptoms subtest. Because the DSFI was intended for clinical use with clients reporting sexual dysfunction, Derogatis and Melisaratos (1979) felt it was necessary that the DSFI measure general psychological functioning. As such, they included an abridged version of the Symptom Checklist – 90 – Revised (Derogatis, 1977) called the Brief Symptom Inventory. Scores from the 53 items are summed and divided by 53 to create a General Severity Index (GSI), otherwise referred to as the psychological symptoms subtest. In the initial validation study, elevated scores on the GSI, which are indicative of increased psychological distress, were related to a variety of sexual dysfunctions in both men and women (e.g., erectile dysfunction, anorgasmia and premature ejaculation).

The sixth section of the DSFI measures affect. According to Derogatis and Melisaratos (1979), a wide range of negative emotions typically accompany sexual dysfunction. The DSFI affect sub test provides a list of 40 positive and negative affective states. The individual being assessed must indicate to what extent he or she has experienced each state (e.g., ashamed, excited, angry, etc.), from never to always, over the preceding two weeks. Positive and negative total scores are summed, and the difference between the two is reported. Higher scores on the affect subtest indicate more positive affect.

The DSFI sexual satisfaction sub test is comprised of two components. The first 10 items, endorsed as either true or false, ask about specific elements of satisfaction (e.g., *usually, I am satisfied with sexual partner, I feel I do not have sex frequently enough, often, I worry about my sexual performance*, etc.). After negative items are reverse keyed, the number of items endorsed as ‘true’ are summed to produce a score ranging from 0 to 10 with greater scores indication greater satisfaction. The second component of the sexual satisfaction sub test is the Global Sexual Satisfaction Index, which is derived from a single item. The item requires the individual being assessed to rate his or her overall sexual satisfaction on a scale from 0 (*could not be worse*) to 8 (*could not be better*).

2.2.2.8 Balanced Inventory of Desirable Responding (BIDR). The BIDR (Paulhus, 1984, 1988, 1991) is a 40-item self-report questionnaire that measures two constructs: “self-deceptive positivity” (honest but positively biased responses; pp. 36; Paulhus, 1991) and impression management (intentional self-presentation to assessor or audience; Paulhus, 1991). Self-deception, which is not necessarily intentional, is reflected in an inflated estimation of one’s positive cognitive attributes and overconfidence in one’s cognitive abilities (judgments and rationality). Impression management is the intentional and systematic over-report on desirable behaviour items and under-report on undesirable behaviour items. For impression management, the claims are overt, and therefore any misrepresentation is intentional. The responses to BIDR items vary along a 7-point Likert scale from 1 (*not true*) to 7 (*very true*). To score the BIDR, negatively keyed items are reversed and one point is given for each extreme response (6 or 7). The BIDR yields two subscales: impression management (IM: items 1 to 20) and self-deception enhancement (SDE; items 21 – 40). For each subscale, the minimum score is 0

and the maximum score is 20. Only individuals who are consistently giving exaggerated responses will get high scores. Both the IM and SDE subscales have good internal consistency with alphas ranging from .75 to .86, and .68 to .80, respectively. Means from normative studies range from 4.3 to 11.9 for the IM subscale and 6.8 to 7.6 for SD subscale (Paulhus, 1991).

2.3 Results

Before undertaking the main analyses, we wanted to insure that our sample had not responded in a socially desirable manner. Social desirability scores are shown in Table 2.2, along with those from the original normative samples (Paulhus, 1991). Men's mean score on the BIDR IM subscale was significantly greater than that reported for the undergraduate male normative sample, $t(5133) = 5.33, p < .001$, although it was also significantly lower than that of the normative sample when instructed to present favourably, $t(5133) = 26.38, p < .001$. To insure that elevated male IM scores were not related to underreporting on the sexuality measures, men's scores for the IM subscale were correlated with scores on the sexuality variables. All correlations were small ($r < .1$; Cohen, 1992), positive and significant, implying that, if anything, increased impression management was related to greater disclosure on sexuality measures. Women's mean score on the IM subscale was not significantly different from that of the undergraduate female normative sample, $t(6707) = 1.60, p = .055$, but was significantly lower than the present favourably normative mean score, $t(6707) = 34.98, p < .001$. Mean SDE scores for men and women were significantly lower than those reported for the normative samples, $t(5135) = 16.59, p < .001$; $t(6411) = 16.67, p < .001$. The overall pattern of

Table 2.2 Means and Standard Deviations of Women and Men for the Balanced Inventory of Desirable Responding

	Women			Men		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
BIDR Impression Management						
This Study	6258	5.2	2.5	4953	5.3	2.5
Paulhus, 1988	251	4.9	3.2	182	4.3	3.2
Paulhus, 1988: <i>Present Favourably</i>	251	10.9	4.2	182	10.5	4.1
BIDR Self Deception Enhancement						
This Study	6261	4.0	2.6	4955	4.1	2.7
Paulhus, 1988	251	6.8	3.1	182	7.5	3.2
Paulhus, 1988: <i>Present Favourably</i>	251	7.8	3.9	182	9.0	3.9

BIDR subscale scores suggests that the sample was not responding in a socially desirable manner to a degree that compromised the data.

There were more women ($n = 7938$) than men ($n = 6458$) in the final sample, $\chi^2(1) = 152.2, p < .001$, but more men ($n = 107$) than women ($n = 69$) reported having sought treatment for sexual compulsivity, addiction or impulsivity, $\chi^2(1) = 18.3, p < .001$. When compared, men and women's scores on all sexuality measures of primary interest were significantly different (see Table 2.3). Therefore men and women were treated as distinct groups. Men and women who had sought treatment for sexual compulsivity, addiction or impulsivity were also treated as distinct groups. Demographic information for the four groups can be found in Tables 2.4 and 2.5.

To analyze age and relationship length differences among the four groups, we used 2 X 2 factorial analysis of variance. There were significant main effects for sex, $F(1, 14380) = 51.40, p < .001$, and having sought treatment, $F(1, 14380) = 44.91, p < .001$, on participant age, with male participants and those who reported seeking treatment being older than female participants and those who had not sought treatment, respectively. The interaction between sex and treatment was not significant. There were also significant main effects for sex, $F(1, 14383) = 37.05, p < .001$, and having sought treatment, $F(1, 14383) = 4.68, p < .05$, on relationship length, with men and participants who had sought treatment reporting longer relationships. Unlike age, however, the interaction between sex and having sought treatment was also significant, $F(1, 14383) = 7.47, p < .01$.

Next, we calculated chi-squares to evaluate group differences in categorical demographic variable distributions (see Tables 2.4 and 2.5). Post-hoc pairwise chi-squares were computed to identify which elements within each set of proportions

Table 2.3 Descriptive Statistics of Women and Men for Sexuality Measures

		<i>n</i>	Min-Max	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	Cohen's <i>d</i>
SDI2-DSD	Women	7078	0-62	39.59	9.85	27.18*	12731	0.48
	Men	5755	0-62	44.06	8.75			
SDI2-SSD	Women	7079	0-23	12.25	6.12	21.58*	12829	0.38
	Men	5757	0-23	14.38	5.07			
SCS	Women	7251	1-4	1.43	0.42	28.25*	11287	0.51
	Men	5834	1-4	1.66	0.51			
SES	Women	6846	20-80	55.78	8.14	18.82*	12395	0.34
	Men	5695	20-80	58.42	7.54			
SIS2	Women	6709	11-44	31.06	4.88	40.28*	12254	0.73
	Men	5547	11-43	27.52	4.79			

Note. SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCS = sexual compulsivity; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences; * $p < .001$.

Table 2.4 Demographic Information for Female Participants

	Non Treatment (<i>n</i> = 7864)	Treatment (<i>n</i> = 69)	Statistic
Age	<i>M</i> = 27.2, <i>SD</i> = 7.4 Range: 18 – 94	<i>M</i> = 30.5, <i>SD</i> = 10.7 Range: 18 – 69	<i>t</i> (68) = 2.61, <i>p</i> = .011
Current Relationship Length (Months)	<i>M</i> = 34.6, <i>SD</i> = 52.0 Range: 0 – 606	<i>M</i> = 31.7, <i>SD</i> = 42.9 Range: 0 – 221	<i>t</i> (7931) = 0.47, <i>p</i> = .642
Ethnic Identity			
Caucasian	83.5% (6563)	88.4% (61)	
Aboriginal	0.7% (52)	1.4% (1)	
Asian	6.3% (497)	4.3% (3)	
East Indian	0.7% (53)	0.0% (0)	$\chi^2(7) = 4.18$, <i>p</i> = .759
African	0.9% (72)	0.0% (0)	
Middle Eastern	0.8% (59)	1.4% (1)	
Latin American	5.4% (141)	0.0% (0)	
Other	5.4% (427)	4.3% (3)	

Table 2.4 (continued)

	Non Treatment (<i>n</i> = 7864)	Treatment (<i>n</i> = 69)	Statistic
Sex Of People Found Most Sexually Attractive			
Only Male	41.9% (3295)	27.5% (19)	$\chi^2(4) = 6.68,$ $p = .154$
Only Female	1.8% (142)	2.9% (2)	
Mainly Male	44.4% (3490)	52.2% (36)	
Mainly Female	3.6% (282)	4.3% (3)	
Equally Male or Female	8.3% (656)	13.0% (9)	
Sexual Identity			
Heterosexual	74.1% (5829)	56.5% (39)	$\chi^2(6) = 54.42,$ $p < .001$
Bisexual	17.2% (1355)	34.8% (24)	
Homosexual	2.2% (175)	1.4% (1)	
Queer	3.8% (296)	5.8% (4)	
Transgendered	0.1% (5)	0.0% (0)	
Intersexed	0.0% (2)	1.4% (1)	
Other	2.6% (203)	0.0% (0)	
Sexual Experience			
With One Sex	49.8% (3917)	27.5% (19)	$\chi^2(1) = 13.57,$ $p < .001$
With Both Sexes	50.2% (3948)	72.5% (50)	

Table 2.4 (continued)

	Non Treatment (<i>n</i> = 7864)	Treatment (<i>n</i> = 69)	Statistic
Relationship Type			
Exclusive	64.3% (5054)	62.3% (43)	$\chi^2(2) = 2.28,$ $p = .320$
Non-Exclusive	13.0% (1023)	18.8% (13)	
No Sexual Relationship	22.7% (1788)	18.8% (13)	
Marital Status			
Single	56.7% (4460)	50.7% (35)	$\chi^2(4) = 7.44,$ $p = .115$
Cohabiting	19.5% (1531)	18.8% (13)	
Married	17.7% (1395)	23.2% (16)	
Divorced	5.9% (465)	5.8% (4)	
Widowed	0.2% (14)	1.4% (1)	
Current Residence			
Canada	32.8% (2573)	26.9% (18)	
United States	60.1% (4714)	70.1% (47)	
China	0.2% (12)	1.5% (1)	
Southeast Asia	0.2% (12)	0.0% (0)	
South Asia	0.0% (3)	0.0% (0)	

Table 2.4 (continued)

	Non Treatment (<i>n</i> = 7864)	Treatment (<i>n</i> = 69)	Statistic
Current Residence			
Asia Other	0.4% (30)	0.0% (0)	$\chi^2(11) = 16.86,$ $p = .155$
Middle East	0.1% (11)	0.0% (0)	
Africa	0.2% (13)	0.0% (0)	
Oceania	1.1% (88)	0.0% (0)	
Latin America	0.3% (23)	0.0% (0)	
Western Europe	4.4% (349)	1.5% (1)	
Eastern Europe and Russia	0.2% (18)	0.0% (0)	
Undergraduate Student			
Yes	30.3% (2384)	30.9% (21)	$\chi^2(1) = 0.01,$ $p = .920$
No	69.7% (5478)	69.1% (47)	
Socio Economic Status			
Extremely Low	1.1% (84)	5.8% (4)	$\chi^2(4) = 32.05,$ $p < .001$
Low	12.2% (925)	18.8% (13)	
Moderate	64.3% (4887)	40.6% (28)	
High	21.5% (1637)	30.4% (21)	
Extremely High	1.0% (73)	4.3% (3)	

Table 2.4 (continued)

	Non Treatment (<i>n</i> = 7864)	Treatment (<i>n</i> = 69)	Statistic
Member of a Religion			
Yes	23.3% (1774)	29.0% (20)	$\chi^2(1)=1.22,$ $p = .269$
No	76.7% (5831)	71.0% (49)	
Importance of Religion			
Not At All Important	48.4% (3678)	44.9% (31)	$\chi^2(4) = 1.05,$ $p = .903$
Slightly Important	23.6% (1792)	24.6% (17)	
Somewhat Important	16.8% (1280)	15.9% (11)	
Quite Important	8.5% (643)	10.1% (7)	
Extremely Important	2.8% (213)	4.3% (3)	
Education			
Middle School	0.4% (34)	4.3% (3)	$\chi^2(7) = 26.18,$ $p < .001$
High School	31.3% (2380)	27.5 (19)%	
Undergraduate Degree	37.1% (2823)	34.8% (24)	
Post Secondary Diploma	5.5% (422)	5.8% (4)	
Professional Degree	6.2% (468)	5.8% (4)	
Masters Degree	16.4% (1245)	14.5% (10)	
PhD	3.1% (232)	7.2% (5)	

Table 2.5 Demographic Information for Male Participants

	Non Treatment (<i>n</i> = 6344)	Treatment (<i>n</i> = 107)	Statistic
Age	<i>M</i> = 30.8 <i>SD</i> = 9.5 Range: 18 – 92	<i>M</i> = 36.3, <i>SD</i> = 10.0 Range: 19 – 70	<i>t</i> (6449) = 5.86, <i>p</i> < .001
Current Relationship Length (Months)	<i>M</i> = 51.8, <i>SD</i> = 79.6 Range: 0 – 1257	<i>M</i> = 76.9, <i>SD</i> = 106.5 Range: 0 – 672	<i>t</i> (108) = 2.43, <i>p</i> = .017
Ethnic Identity			
Caucasian	87.3% (5543)	88.8% (95)	$\chi^2(7) = 2.99$, <i>p</i> = .886
Aboriginal	0.4% (28)	0.0% (0)	
Asian	4.2% (268)	2.8% (3)	
East Indian	1.1% (67)	0.9% (1)	
African	0.6% (41)	0.0% (0)	
Middle Eastern	0.6% (40)	0.0% (0)	
Latin American	2.2% (140)	2.8% (3)	
Other	3.5% (220)	3.5% (5)	

Table 2.5 (continued)

	Non Treatment (<i>n</i> = 6344)	Treatment (<i>n</i> = 107)	Statistic
Sex Of People Found Most Sexually Attractive			
Only Female	68.4% (4343)	63.6% (68)	$\chi^2(4) = 5.65,$ $p = .227$
Only Male	9.4% (595)	14.0% (15)	
Mainly Female	17.2% (1093)	20.6% (22)	
Mainly Male	3.4% (217)	0.9% (1)	
Equally Female or Male	1.6% (100)	0.9% (1)	
Sexual Identity			
Heterosexual	79.4% (5041)	69.2% (74)	$\chi^2(6) = 39.10,$ $p < .001$
Bisexual	7.2% (455)	14.0% (15)	
Homosexual	10.4% (660)	13.1% (14)	
Queer	1.5% (93)	0.9% (1)	
Transgendered	0.3% (20)	0.9% (1)	
Intersexed	0.0% (1)	0.9% (1)	
Other	1.2% (78)	0.9% (1)	
Sexual Experience			
With One Sex	66.6% (4227)	46.7% (50)	$\chi^2(1) = 18.56,$ $p < .001$
With Both Sexes	33.4% (2121)	53.3% (57)	

Table 2.5 (continued)

	Non Treatment (<i>n</i> = 6344)	Treatment (<i>n</i> = 107)	Statistic
Relationship Type			
Exclusive	60.6% (3847)	64.5% (69)	$\chi^2(2) = 2.76,$ $p = .251$
Non-Exclusive	14.0% (886)	16.8% (18)	
No Sexual Relationship	25.4% (1614)	18.7% (20)	
Marital Status			
Single	52.2% (3309)	34.6% (37)	$\chi^2(4) = 26.50,$ $p < .001$
Cohabiting	15.5% (981)	14.0% (15)	
Married	26.1% (1654)	37.4% (40)	
Divorced	6.0% (383)	12.1% (13)	
Widowed	0.3% (18)	1.9% (2)	
Current Residence			
Canada	17.3% (1719)	22.5% (24)	
United States	63.0% (3979)	69.2% (74)	
China	0.4% (28)	0.0% (0)	
Southeast Asia	0.3% (17)	0.0% (0)	
South Asia	0.1% (9)	0.9% (1)	

Table 2.5 (continued)

	Non Treatment (<i>n</i> = 6344)	Treatment (<i>n</i> = 107)	Statistic
Current Residence			
Asia Other	0.5% (34)	0.9% (1)	$\chi^2(11) = 20.21,$ $p = .047$
Middle East	0.2% (12)	0.9% (1)	
Africa	0.2% (10)	0.0% (0)	
Oceania	1.7% (107)	0.0% (0)	
Latin America	0.6% (36)	0.9% (1)	
Western Europe	5.4% (341)	2.8% (3)	
Eastern Europe and Russia	0.3% (21)	1.9% (2)	
Undergraduate Student			
Yes	20.5% (1302)	16.8% (18)	$\chi^2(1) = 0.88,$ $p = .347$
No	79.5% (5043)	83.1% (89)	
Socio Economic Status			
Extremely Low	0.8% (48)	1.0% (1)	$\chi^2(4) = 1.70,$ $p = .791$
Low	9.6% (595)	12.7% (13)	
Moderate	61.0% (3765)	57.8% (59)	
High	26.6% (1645)	25.5% (26)	
Extremely High	2.0% (124)	2.9% (3)	

Table 2.5 (continued)

	Non Treatment (<i>n</i> = 6344)	Treatment (<i>n</i> = 107)	Statistic
Member of a Religion			
Yes	40.2% (2481)	60.8% (62)	$\chi^2(1) = 10.85,$ $p = .001$
No	59.8% (3696)	39.2% (40)	
Importance of Religion			
Not At All Important	54.6% (3373)	39.3% (40)	$\chi^2(4) = 26.44,$ $p < .001$
Slightly Important	21.4% (1319)	23.5% (24)	
Somewhat Important	13.9% (861)	14.7% (15)	
Quite Important	7.4% (456)	12.7% (13)	
Extremely Important	2.7% (167)	9.8% (10)	
Education			
Middle School	0.6% (36)	3.9% (4)	$\chi^2(7) = 24.04,$ $p = .001$
High School	27.5% (1699)	18.6% (19)	
Undergraduate Degree	36.9% (2277)	38.2% (39)	
Post Secondary Diploma	6.0% (372)	2.9% (3)	
Professional Degree	8.8% (543)	10.8% (11)	
Masters Degree	15.3% (947)	18.6% (19)	
PhD	4.9% (303)	6.9% (7)	

accounted for significant differences in distributions on each demographic variable (Cox & Key, 1993). Participants were predominantly Caucasian with no significant difference in the proportion of ethnicities represented in the non treatment and treatment groups. The greatest proportion of female participants reported being sexually attracted mainly to men but also somewhat to women. The proportions of people found most sexually attractive were not significantly different when treatment and non treatment groups were compared. Most male participants indicated that they were only sexually attracted to women and the proportions represented were not significantly different for treatment and non treatment groups. When asked about their sexual identity, a greater proportion of non treatment women identified as heterosexual when compared to women in the treatment group. The pattern was similar for male participants. Male and female participants who had sought treatment were more likely to have had sexual experiences with both sexes than the non treatment groups. Most participants, regardless of sex or treatment status, were in exclusive sexual relationships. There was no significant difference in the proportion of relationship types reported when treatment and non treatment groups were compared. However, significantly more men and women who had sought treatment were married than those in the two non treatment groups. The large majority of participants were non undergraduates, of moderate SES and from North America. Male participants who had sought treatment were more likely to be from North America than their non treatment counterparts. The distribution of SES for female participants who had sought treatment was more varied than those who had not. Female participants were not typically members of religions and religion was not of importance to them. Treatment seeking male participants were more likely to be members of a religion and were also

significantly more likely to report that religion was important to them; the opposite pattern was true for non treatment seeking men. The majority of male and female participants reported having undergraduate degrees, although a greater proportion of the two treatment seeking groups had higher levels of education than the non treatment seeking groups.

To address the first hypothesis, a series of independent samples *t*-tests were calculated to compare non treatment and treatment groups on the various sexuality measures. Descriptive statistics for men and women, along with the *t*-test results, can be found in Tables 2.6 and 2.7. For each comparison, Levene's test for equality of variances was first executed (Tabachnick & Fidell, 1996). If the assumption of homogeneity of variance was violated, the *t* value for unequal variances is reported along with the alternate degrees of freedom. Since the sample sizes for non treatment groups were large, and therefore statistical power potentially produced significance for differences that had little meaning, effect sizes (Cohen's *d*) were calculated to quantify the true magnitude of group differences. We used Cohen's suggested cutoffs of 0.2, 0.5 and 0.8 to be indicative of *t* value effect sizes that are small, medium and large, respectively (Cohen, 1992).

Compared to non treatment seeking women, those who had sought treatment scored greater on dyadic sexual desire, solitary sexual desire, sexual compulsivity and sexual excitation, and lower on sexual inhibition due to fear of performance consequences. They also reported being younger at age of first sexual interest, having more psychological symptoms, lower affect, and less sexual satisfaction. Effect sizes ranged from small to large; the effect size for sexual compulsivity ($d = 1.05$) was the only one to exceed 0.8. There were no significant differences between the groups in average

Table 2.6 Sexuality Measure Descriptive Statistics for Non Treatment and Treatment Seeking

Women		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Average Frequency Of Masturbating Per Week	NT	2.80	3.40	1.11	7069	.269	ns
	T	3.29	4.91				
Average Hours Spent Per Week Viewing Pornography	NT	1.17	5.00	0.79	7068	.429	ns
	T	1.69	3.12				
Total Partnered Sexual Activity In The Preceding 3 Months	NT	49.20	476.00	0.16	7040	.873	ns
	T	59.10	102.59				
Average Weekly TSO	NT	5.56	8.92	3.13	60	.123	ns
	T	9.21	18.17				
SDI2-DSD	NT	39.57	9.86	2.28*	7072	.022	0.31
	T	42.46	8.60				
SDI2-SSD	NT	12.24	6.12	2.05*	7073	.040	0.27
	T	13.85	5.80				
SCS	NT	1.42	0.42	6.77***	61	< .001	1.05
	T	2.04	0.72				
SES	NT	55.74	8.14	4.13***	6840	< .001	0.54
	T	60.14	8.18				

SIS2	NT	31.07	4.87	2.85***	6703	.004	0.35
	T	29.26	5.54				
DSFI – Ideal Weekly Frequency of Intercourse	NT	4.73	5.00	1.06	65	.294	<i>ns</i>
	T	5.66	7.07				
DSFI – Age Of First Sexual Interest	NT	12.50	3.63	4.04***	65	< .001	0.53
	T	10.47	4.03				
DSFI – Psychological Symptoms	NT	0.58	0.49	3.20***	60	.002	0.49
	T	0.91	0.80				
DSFI – Affects	NT	1.27	1.02	4.49***	6923	< .001	0.55
	T	0.68	1.15				
DSFI – Sexual Satisfaction	NT	7.45	2.01	3.34***	6199	.001	0.45
	T	6.51	2.11				
DSFI – Global Sexual Satisfaction Index	NT	5.67	1.64	2.37*	43	.022	0.40
	T	4.93	2.05				

Note. NT = Subjects who have not sought treatment for sexual compulsivity, addiction or impulsivity (No Treatment); T = Subjects who have sought treatment for sexual compulsivity, addiction or impulsivity (Treatment); SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCS = sexual compulsivity; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences; *ns* = Non significant; * $p < .05$; ** $p < .01$; *** $p < .005$.

Table 2.7 Sexuality Measure Descriptive Statistics for Non Treatment and Treatment Seeking

Men							
		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Average Frequency Of Masturbating Per Week	NT	5.33	4.54	1.63	89	.107	<i>ns</i>
	T	6.71	7.97				
Average Hours Spent Per Week Viewing Pornography	NT	3.69	4.87	2.37*	88	.041	0.29
	T	6.83	7.58				
Total Partnered Sexual Activity In The Preceding 3 Months	NT	44.44	100.90	0.85	5590	.395	<i>ns</i>
	T	35.27	34.67				
Average Weekly TSO	NT	7.68	8.90	0.65	5819	.516	<i>ns</i>
	T	8.31	10.95				
SDI2-DSD	NT	44.02	8.74	2.94***	5750	.003	0.32
	T	46.85	9.16				
SDI2-SSD	NT	14.36	5.08	2.84**	5752	.005	0.33
	T	15.94	4.59				
SCS	NT	1.65	0.49	9.33***	91	< .001	1.18
	T	2.43	0.80				
SES	NT	58.38	7.53	3.29***	5690	.001	0.35
	T	61.03	7.81				

SIS2	NT	27.54	4.80	2.23*	5542	.024	0.26
	T	26.37	4.31				
DSFI – Ideal Weekly Frequency of Intercourse	NT	5.56	4.62	2.01*	5825	.044	0.21
	T	6.54	4.59				
DSFI – Age Of First Sexual Interest	NT	11.75	2.69	4.46***	5833	< .001	0.45
	T	10.49	2.88				
DSFI – Psychological Symptoms	NT	0.52	0.46	0.15	5563	.877	<i>ns</i>
	T	0.52	0.42				
DSFI – Affects	NT	1.31	1.00	1.14	5443	.256	<i>ns</i>
	T	1.20	1.10				
DSFI – Sexual Satisfaction	NT	7.42	1.99	2.41*	4923	.016	0.27
	T	6.91	1.83				
DSFI – Global Sexual Satisfaction Index	NT	5.36	1.81	2.21*	4078	.027	0.26
	T	4.87	1.97				

Note. NT = Subjects who have not sought treatment for sexual compulsivity, addiction or impulsivity (No Treatment); T = Subjects who have sought treatment for sexual compulsivity, addiction or impulsivity (Treatment); SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCS = sexual compulsivity; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences; *ns* = Non significant; * $p < .05$; ** $p < .01$; *** $p < .005$.

frequency of masturbation, hours spent viewing pornography, partnered sexual activity, total sexual outlet, sexual experiences and ideal frequency of intercourse.

Treatment seeking men, compared to non treatment seeking men, also scored greater on dyadic sexual desire, solitary sexual desire, sexual compulsivity and sexual excitation, and lower on sexual inhibition due to fear of performance consequences. They reported spending more time viewing pornography, a greater ideal weekly frequency of intercourse and less sexual satisfaction. Effect sizes for the male group differences also ranged from small to large with the effect for sexual compulsivity ($d = 1.18$) being the only to exceed the 0.8 cutoff. There were no significant group differences for frequency of masturbation, total partnered sexual activity, total sexual outlet, psychological symptoms and affects.

To test our second hypothesis, we quantified the relationships among sexual compulsivity, sexual desire and sexual inhibition variables with Pearson correlation coefficients. As markers of sexual desire, we included sexual excitation (SES), dyadic sexual desire (SDI2-DSD), solitary sexual desire (SDI2-SSD) and average weekly total sexual outlet (TSO). Before correlations were calculated, the skew for each variable was examined as skew can attenuate correlation coefficients (Calkins, 1974; Dunlap, Burke, & Greer, 1995). The distribution of sexual compulsivity scores was the only one to be substantially skewed ($S = 1.62$, $SE = .021$). Because sexual compulsivity is purportedly uncommon in the general population, we had predicted that the vast majority of participants would score low on the measure, thus creating a positively skewed distribution. An inverse transformation reduced skew to an acceptable level ($S = 0.26$, $SE = .021$). The transformed sexual compulsivity scores were used for subsequent analyses.

The scatterplots for each correlation were examined to insure that relationships were linear. To identify the effect size of correlations, we adhered to Cohen's (1992) recommendation that coefficients of 0.1, 0.3 and 0.5 indicate the lower bounds of small, medium and large effect sizes. Correlation results are presented in Tables 2.8 and 2.9.

The pattern of correlations was the same for non treatment men and women. Sexual compulsivity was positively and significantly related to all markers of sexual desire (i.e., dyadic sexual desire, solitary sexual desire, average weekly total sexual outlet and sexual excitation). Effect sizes ranged from small to medium. Sexual inhibition was negatively and significantly correlated with all markers of sexual desire, as well as sexual compulsivity. The weakest correlations were those between weekly total sexual outlet and the other variables; all correlation effect sizes were small. The markers of sexual desire all correlated significantly with each other. The correlation between dyadic sexual desire and sexual excitation was the only to exceed 0.5, indicating a large effect size. Age did not significantly correlate with most sexuality variables across the four groups; correlations that did reach significance were of small effect size.

In the male and female treatment groups, the pattern of correlations was similar to that for the non treatment participants; however, nearly half the correlations did not reach significance, particularly those for sexual inhibition and solitary sexual desire. This is likely an issue of insufficient power, due to the smaller groups, in conjunction with small effect sizes (Cohen, 1992).

To assess our third hypothesis, we used Exploratory Factor Analysis (EFA) to determine how many underlying latent variables could account for the scores on and relationships among the markers of sexual desire and sexual compulsivity. Based on the

Table 2.8 Correlations among Measures of Sexual Excitation, Desire, Inhibition and Compulsivity for Non Treatment and Treatment Seeking Women

		Age	SCSTrans	SDI2-DSD	SDI2-SSD	Average Weekly TSO	SES
SCSTrans	NT	-.013 $p = .268$					
	T	-.137 $p = .292$					
SDI2-DSD	NT	-.050*** $p < .001$	.445*** $p < .001$				
	T	-.341** $p = .008$	.307* $p = .018$				
SDI2-SSD	NT	.078*** $p < .001$	.310*** $p < .001$	.349*** $p < .001$			
	T	-.211 $p = .106$	.167 $p = .207$	.250 $p = .052$			
Average Weekly TSO	NT	.025 $p = .037$	.135*** $p < .001$	.172*** $p < .001$	.156*** $p < .001$		
	T	-.177 $p = .177$	.281* $p = .031$	.245 $p = .059$	.306* $p = .017$		
SES	NT	.060** $p < .001$	.452*** $p < .001$	.599*** $p < .001$	.421*** $p < .001$	.127*** $p < .001$	
	T	-.261* $p = .046$	.416** $p = .001$	.425** $p = .001$	.131 $p = .326$	.276* $p = .037$	

SIS2	NT	-.002 $p = .901$	-.253*** $p < .001$	-.228*** $p < .001$	-.177*** $p < .001$	-.109*** $p < .001$	-.247*** $p < .001$
	T	.064 $p = .628$	-.304* $p = .023$	-.141 $p = .291$	-.148 $p = .267$	-.048 $p = .725$	-.315* $p = .015$

Note. NT = Subjects who have not sought treatment for sexual compulsivity, addiction or impulsivity (No Treatment); T = Subjects who have sought treatment for sexual compulsivity, addiction or impulsivity (Treatment); SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCSTrans = sexual compulsivity transformed; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences * $p < .05$; ** $p < .01$; *** $p < .005$.

Table 2.9 Correlations among Measures of Sexual Excitation, Desire, Inhibition and Compulsivity for Non Treatment and Treatment Seeking Men

		Age	SCSTrans	SDI2-DSD	SDI2-SSD	Average Weekly TSO	SES
SCSTrans	NT	.042** $p = .001$					
	T	-.058 $p = .582$					
SDI2-DSD	NT	-.021 $p = .119$	.381*** $p < .001$				
	T	-.124 $p = .262$	.395*** $p < .001$				
SDI2-SSD	NT	.025 $p = .063$	.223*** $p < .001$	.283*** $p < .001$			
	T	.192 $p = .080$	.277* $p = .012$	.142 $p = .199$			
Average Weekly TSO	NT	-.042** $p = .002$	.109*** $p < .001$	.141*** $p < .001$	.169*** $p < .001$		
	T	-.005 $p = .965$	.072 $p = .514$	.222* $p = .046$	-.046 $p = .684$		
SES	NT	.057*** $p < .001$	.351*** $p < .001$	.521*** $p < .001$	.343*** $p < .001$	.076*** $p < .001$	
	T	.017 $p = .873$	.382*** $p < .001$	.486*** $p < .001$	.355** $p = .001$	.105 $p = .347$	

SIS2	NT	.078*** $p < .001$	-.141*** $p < .001$	-.227*** $p < .001$	-.091*** $p < .001$	-.106*** $p < .001$	-.181*** $p < .001$
	T	-.073 $p = .500$	-.141 $p = .203$	-.250* $p = .024$	-.207 $p = .064$	-.130 $p = .248$	-.150 $p = .162$

Note. NT = Subjects who have not sought treatment for sexual compulsivity, addiction or impulsivity (No Treatment); T = Subjects who have sought treatment for sexual compulsivity, addiction or impulsivity (Treatment); SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCSTrans = sexual compulsivity transformed; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences * $p < .05$; ** $p < .01$; *** $p < .005$.

size of the intercorrelations for both men and women, the variables that seemed to be the best indicators of sexual desire were dyadic sexual desire (SDI2-DSD), solitary sexual desire (SDI2-SSD) and sexual excitation (SES). They also appeared to best discriminate the treatment from non treatment groups in the group comparisons. Therefore, they were entered in the EFA along with the transformed sexual compulsivity variable. Average weekly total sexual outlet (TSO), which we had expected to be at least moderately related to other markers of sexual desire, only correlated weakly with these. For that reason, TSO was not included in the EFA. The transformed scores for sexual compulsivity were selected rather than the untransformed scores, as EFA is based on correlations among input variables and skew can attenuate those correlations (Tabachnick & Fidell, 1996). From the possible extraction methods available, we chose principal components as it is extracts maximum variance from the input variables with each resultant factor (Tabachnick & Fidell, 1996), is less sensitive to deviations from multivariate normality and is less likely to produce improper solutions (Brown, 2006). We had predicted a one factor solution; however, it was possible that EFA would extract two factors with sexual desire variables loading on one factor and sexual compulsivity on the other. In this case we expected that the factors would be correlated as previous analyses had already indicated that sexual compulsivity and sexual desire variables were positively related. Therefore, we allowed for oblique rotation should the EFA produce a two factor solution. The Kaiser-Guttman rule was employed for factor identification; eigenvalues greater than one identified the emergence of a factor (Brown, 2006). We examined resulting scree plots to confirm factor structure using the recommendations of Cattell (1966).

The analyses produced a one factor solution for all four groups, indicating that a single underlying latent variable, or factor, could account for scores on and the relationships among sexual compulsivity and the markers of sexual desire. Eigenvalues and the associated scree plots can be found in Tables 2.10 and Figure 2.1, respectively. The factor loadings indicate that all variables load substantially on the single resultant factor (see Table 2.11). Loadings of greater than .71 are considered excellent, .63 very good, .55 good, .45 fair and .32 poor (Comrey & Lee, 1992). With exception of one loading that was very good (i.e. sexual compulsivity in non treatment men), all loadings for sexual excitation, dyadic sexual desire and sexual compulsivity were excellent across the four groups. The loadings for solitary sexual desire ranged from poor to very good.

The final stage of analysis, and test of the fourth hypothesis, addressed the relationships among sexual desire, sexual compulsivity and risky sexual behaviours (RSB). Subjects who were not sexually active were excluded from analyses. We also assumed that participants in exclusive relationships were not at any risk. It is possible that the partner of a participant reporting an exclusive sexual relationship in which condoms were not used could have had sex outside the relationship, thus increasing risk within the primary relationship, but there was no way to determine if that was the case. Therefore, participants in exclusive sexual relationships were not included in RSB analyses. The RSB descriptive statistics for the final male and female RSB analysis sub groups can be found in Table 2.12. Men reported a greater number of partners than did women, $t(1234) = 3.48, p = .001$, but men and women did not significantly differ in instances of unprotected sex, $t(1169) = 1.87, p = .062$.

Table 2.10. Exploratory Factor Analysis Eigenvalues

Component	Non Treatment Women <i>N</i> = 6526	Non Treatment Men <i>N</i> = 5302	Treatment Women <i>N</i> = 56	Treatment Men <i>N</i> = 81
1	2.296	2.062	2.014	1.996
2	.720	.798	.873	.844
3	.593	.668	.639	.618
4	.391	.472	.474	.542

Note. Extraction method: Principal Components Analysis. Eigenvalues of 1 or more indicate the emergence of a factor.

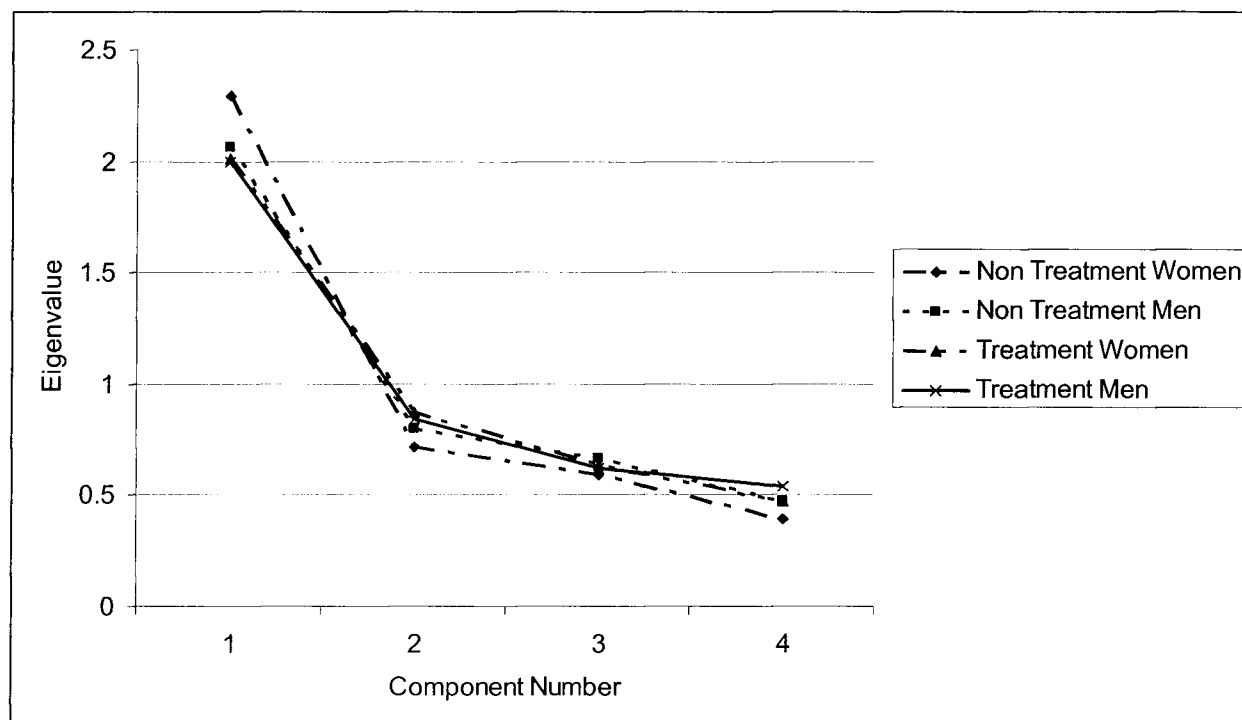
Figure 2.1 Exploratory Factor Analysis Scree Plots

Table 2.11 Exploratory Factor Analyses Factor Loadings

	Non Treatment Women <i>N</i> = 6526	Non Treatment Men <i>N</i> = 5302	Treatment Women <i>N</i> = 56	Treatment Men <i>N</i> = 137
SCSTrans	.721	.667	.726	.733
SDI2-DSD	.807	.786	.751	.727
SDI2-SSD	.652	.601	.437	.564
SES	.837	.799	.780	.794

Note. Extraction method: Principal Components Analysis; SDI2-DSD = dyadic sexual desire; SDI2-SSD = solitary sexual desire; SCSTrans = sexual compulsivity transformed; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences.

Table 2.12 Risky Sexual Behaviours for Men and Women In Non Exclusive Sexual Relationships

	Women				Men			
	<i>N</i>	Range	<i>M</i>	<i>SD</i>	<i>N</i>	Range	<i>M</i>	<i>SD</i>
Number Of Partners In The Preceding 3 Months	927	1-214	6.00	10.49	759	1-250	8.34	16.47
Number Of Instances Of Unprotected Sex	923	0-606	15.79	39.30	758	0-1019	20.93	66.96

We predicted that many people included in RSB analysis groups would avoid putting themselves at sexual risk. This appeared to be the case as the distributions of RSB scores were positively skewed. Since the final stage of analysis was also correlation based, and we wanted to again avoid attenuated correlation coefficients, we normalized the positively skewed RSB distributions using $\log(10)$ transforms (Tabachnick & Fidell, 1996). Skew coefficients for untransformed and transformed distributions can be found in Table 2.13.

Based on the previous results, sexual excitation and dyadic sexual desire seemed to be the best markers of partnered sexual desire and were therefore used in the RSB analysis. The correlations between sexual compulsivity, sexual excitation, dyadic sexual desire and the two RSB variables can be found in Table 2.14. Effect sizes for significant correlations were all small. For both men and women, only dyadic sexual desire correlated with number of instances of unprotected sex; sexual excitation and sexual compulsivity did not. Because of this, they could not be compared. Dyadic sexual desire, sexual excitation and sexual compulsivity each correlated significantly with number of partners in both female and male groups. Since sexual compulsivity was unrelated to instances of unprotected sex, only number of partners was included as an indicator of RSB for the next step in analysis.

Two methods were used to determine if sexual desire could account for the correlation between sexual compulsivity and RSB. First, using the procedure outlined in Meng, Rosenthal and Rubin (1992), we compared the strength of the correlations between each of sexual desire and sexual compulsivity, and number of partners. The

Table 2.13 Skew Statistics for Transformed and Non Transformed RSB Variables

	Women		Men	
	<i>S</i>	<i>SE</i>	<i>S</i>	<i>SE</i>
Number Of Partners In The Preceding 3 Months	11.582	.080	8.782	.089
Number Of Partners In The Preceding 3 Months - Transformed	.999	.080	.920	.089
Number Of Instances Of Unprotected Sex - Transformed	9.012	.080	10.388	.089
Number Of Instances Of Unprotected Sex - Transformed	.009	.097	.104	.105

Table 2.14 Correlations between Transformed Risky Sexual Behaviour Scores and Measures of Sexual Desire, Inhibition and Compulsivity

		SCSTrans	SDI2-DSD	SES
Number Of Partners In The Preceding 3 Months – Transformed	Women	.183***	.164***	.118***
		$p < .001$	$p < .001$	$p < .001$
	Men	.161***	.239***	.132***
		$p < .001$	$p < .001$	$p < .001$
Number Of Instances Of Unprotected Sex – Transformed	Women	-.021	.087*	.029
		$p = .611$	$p = .032$	$p = .481$
	Men	.083	.180***	.077
		$p = .058$	$p < .001$	$p = .078$

Note. SCSTrans = sexual compulsivity transformed; SDI2-DSD = dyadic sexual desire; SES = sexual excitation; * $p < .05$; ** $p < .01$; *** $p < .005$.

correlations between each of sexual compulsivity and sexual excitation, and number of partners did not significantly differ for women, $Z = 1.90$, $p = .057$, 2-tailed, or men, $Z = 0.68$, $p = .497$, 2-tailed. For men, the strength of the correlation between dyadic sexual desire and number of partners exceeded that of sexual compulsivity with number of partners, $Z = 2.19$, $p = .029$. For women, there was no significant difference, $Z = 0.55$, $p = .582$, 2-tailed. Second, we controlled for the effects of sexual desire on the relationship between sexual compulsivity and RSB. To do so, we calculated second order partial correlations for sexual compulsivity and number of partners, partialing out the effects sexual excitation and dyadic sexual desire. For men, the partial correlation dropped below significance, indicating that sexual desire accounts for the relationship between sexual compulsivity and number of partners. In other words, the relationship between sexual compulsivity and number of partners was spurious. For women, the partial correlation was of smaller magnitude than the uncontrolled bivariate correlation between sexual compulsivity and number of partners, although it did remain significant. This indicates that sexual excitation and dyadic sexual desire may contribute to the association between sexual compulsivity and number of sexual partners.

2.4 Discussion

To the best of our knowledge, this is the first time that scores on the Sexual Compulsivity Scale have been reported for individuals who have sought treatment for sexual compulsivity, addiction or impulsivity. We hypothesized that those men and women who had sought treatment compared to those who had not, would score higher on the SCS and other sexuality measures. The data confirmed our prediction. The largest

difference between treatment and non treatment groups was on the SCS. This is not surprising, as the fundamental difference between the treatment and non treatment groups, regardless of scores on the various measures, is treatment seeking behaviour. Certain elements of the SCS capture distress and problems associated with managing sexual thoughts, feelings and behaviours. If that distress becomes unmanageable, treatment seeking behaviour would be expected. As Kalichman and Cain (2004) cautioned, though, high scores on the SCS are not indicative of a clinical disorder.

The treatment seeking and non treatment groups also differed on other sexuality measures. As we had predicted in our first hypothesis, male and female treatment groups scored higher on sexual excitation, dyadic sexual desire and solitary sexual desire. These results concur with previous research showing that those who seek treatment for dysregulated sexuality exhibit heightened sexual desire (Bancroft & Vukadinovic, 2004; Kafka, 1997; Kafka & Hennen, 1999, 2003). In addition, demographic data from the treatment and non treatment groups implies that treatment seekers may be more sexualized. They were more likely to have non sex specific sexual preference, to identify as bisexual and to have had sexual experience with both men and women. There was also a greater proportion of men in the treatment group than in the non treatment group. Based on our sex comparisons and findings from past research, men, in general, score higher on sexual desire (e.g., Giargiari, Mahaffey, Craighead, & Hutchison, 2005; Regan & Atkins, 2006). Theoretically, individuals with strong sexual desire should be more attuned to sexual stimuli and more likely to become sexually aroused. They may spend more time thinking about sex and high levels of sexual activity, either with a partner or alone, may be pursued.

Results from the group comparisons imply that participants who sought treatment may be characterised as having heightened sexual desire but no corresponding increase in sexual outlet. Treatment group participants reported less sexual satisfaction and tended to be in longer relationships; sexual activity in relationships typically decreases with increasing relationship length (Call, Sprecher, & Schwarz, 1995). In addition, the treatment groups, compared to the non treatment groups, did not differ in average weekly TSO or frequency of partnered and solitary sexual activity. Since heightened sexual desire is conceptually equivalent to increased appetite for sexual activity, and participants who had sought treatment scored higher on measures of sexual desire, it would be assumed that they would also report higher levels of sexual activity. Although an individual may desire a high frequency of partnered sexual activity, a partner must be available and cooperative. In terms of solitary sexual activity, some individual's attitudes towards masturbation may still remain negative despite increased social acceptance of masturbation as a sexual outlet (Das, 2007; Laumann, Gagnon, Michael, & Michaels, 1994). For those participants who had sought treatment, it is possible that increased sexual needs, as a result of heightened sexual desire, were not being met either with or without a partner.

Treatment seekers in our sample scored lower on sexual inhibition due to threat of performance consequences. This indicates that when in situations where risk for unwanted pregnancy, STIs or legal repercussions is present, treatment seekers are more likely to remain sexually aroused. One of the things that may differentiate those who seek treatment from those who do not but also score high on sexual desire, is an inability to regulate sexual arousal. Descriptions of dysregulated sexuality found in the literature

substantiate this idea. The hallmarks of the construct, as it is currently understood, include uncontrollable sexual thoughts, fantasies urges, desires and impulses. Although the sexual inhibition measure we used does not directly assess for sexual arousal regulation, it may be related. The potential role of sexual arousal regulation in dysregulated sexuality warrants further exploration.

Interestingly, male treatment seekers in our sample were more likely to be members of organized religion and feel that religion was important to them. Since sexual behaviour is typically proscribed by organized religion and negative attitudes towards sexuality have been linked with increased religiosity (de Visser, Smith, Richters, & Rissel, 2007; Le Gall, Mullet, & Shafighi, 2002; Lefkowitz, Gillen, Shearer, & Boone, 2004), it may be that substantially increased sexual desire, especially in conjunction with any same sex sexual preference, is particularly distressing for those who subscribe to religious doctrine. Although our data does not address the issue, it is possible that a proportion of people who seek treatment for dysregulated sexuality experience increased distress due to socio-ethical and religious constraints on sexuality (Bancroft & Vukadinovic, 2004; Coleman, 1986). Conversely, distress and treatment seeking behaviour may not be as likely for individuals who do not experience such restrictions on sexual expression.

In this sample, participants who had sought treatment for sexual compulsivity, impulsivity or addiction seemed to experience heightened sexual desire and lower sexual inhibition in conjunction with unmet sexual needs or increased social constraint. For individuals at the high end of the sexual desire continuum, sexual thoughts and feelings may become powerful enough that they become intrusive. If regulation of those sexual

thoughts and feelings is unsuccessful, preoccupation, compulsions, obsessions and a loss of control may be experienced. Also, the mere act of trying to suppress those thoughts and feelings may increase arousal, leading to an ongoing cycle of attempted suppression followed by ever increasing arousal. This pattern has been described in work on general emotion suppression (Wegner, Shortt, Blake, & Page, 1990) and is characteristic of individuals prone to obsessional thinking (Wegner & Zanakos, 1994). For someone struggling with sexual preoccupations, compulsions and obsessions, distress may become unmanageable and treatment seeking behaviour could be expected. Given the salience of sexual desire, especially for those at the high end of the spectrum, unmet needs or social constraint upon sexuality may exacerbate the pattern of thoughts and feelings that could also potentially drive someone to seek therapeutic intervention. This does not preclude other reasons why sexual behaviour can appear to become compulsive, impulsive or addictive. For example, Bancroft and Vukadinovic (2004) suggested that sexual behaviours can take on an addictive-like quality when they become a means by which to ameliorate negative affective states.

Among the group comparisons were a two significant sex differences. Women who had sought treatment reported being younger at age of first sexual interest, while men who had sought treatment reported spending more time viewing pornography and a greater ideal weekly frequency of intercourse. Although our data do not clarify the source of these sex differences, they support the general impression of increased expression of sexuality in the treatment groups, possibly manifested differently in men and women.

Treatment seeking women scored higher on psychological symptoms and negative affects while their male counterparts did not. Given that previous studies have

linked dysregulated sexuality with increased depression, anxiety and other negative psychological sequelae (Bancroft & Vukadinovic, 2004; Black, Kehrberg, Flumerfelt, & Schlosser, 1997; Raymond et al., 2003), we expected that the both treatment groups would report more psychological symptoms and greater negative affect. This inconsistency between the sexes cannot be explained by abnormal scores on either subscale for any of the four groups. Average scores on the DSFI psychological symptoms and affects subscales from previous studies range from 0.44 to 0.82, and 0.72 to 1.72, respectively (Derogatis & Melisaratos, 1979; Meana & Nunnink, 2006). The scores for our two non treatment groups, as well as the men who had sought treatment, fall within those ranges. Only the scores for the treatment seeking women fall outside the ranges of scores reported previously. We propose that disparity in sexual permissiveness between the sexes can explain why only female treatment seekers reported increased psychological symptoms and negative affects. It has been established that women, on average, are less sexually permissive than men (Hendrick, Hendrick, & Reich, 2005; Le Gall et al., 2002; Oliver & Hyde, 1993). Higher scores on psychological symptoms and increased negative affects for female treatment seekers in our sample may be a consequence of dissonance caused by the juxtaposition of heightened sexual desire and decreased sexual permissiveness characteristic of women in general. This possible explanation, along with other questions brought about from our group comparisons, demand further study.

It should be noted that the TSO scores for our sample are substantially higher than those reported by Kinsey, Pomeroy and Martin (1948), which fell between one and three for the various age and sex sub groups. No TSO data for the general population have

been published since. The only recent TSO data available are from studies of hypersexuality in men seeking treatment for PRDs and PAs (Kafka, 1997; Kafka & Hennen, 2003). Control participants were not included in those studies. We suspect that high TSOs reported by our sample relative to those published by Kinsey and colleagues reflect a shift in sexual attitudes and recognition of sexual outlet as a culturally acceptable and healthy behaviour.

The second and third hypotheses directly addressed the relationship between dysregulated sexuality and sexual desire in men, women and male and female treatment groups. Sexual compulsivity, sexual excitation, dyadic sexual desire and solitary sexual desire were all significantly intercorrelated, confirming our prediction that dysregulated sexuality would be associated with heightened sexual desire in treatment and non treatment groups. Exploratory factor analysis produced a one factor solution for all four study groups, indicating that a single underlying latent variable or factor accounts for the scores on – and the relationships among – the sexual desire and sexual compulsivity variables. In other words, these data suggest that dysregulated sexuality, as it has been conceptualized and is measured by the SCS, is indistinguishable from measures of sexual desire.

There are two possible explanations for the EFA results. First, the SCS may be a poor measure of dysregulated sexuality. Many of the SCS items tap into thoughts, feelings and behaviours that would be expected of someone who exhibits very high sex desire rather than dysregulated sexuality (e.g., *my sexual appetite has gotten in the way of my relationships; I find myself thinking of sex while at work; and It has been difficult for me to find sex partners who desire having sex as much as I want to*). In other words,

measure specificity may be a problem despite face validity of most SCS items. However, the measure was based on self-reports from sex addicts and touches upon all the hallmarks of sexual compulsivity as it is currently conceptualized, and as such it should at least partially capture dysregulated sexuality when present. The recent validation of another sexual compulsivity measure substantiates this conclusion (Miner, Coleman, Center, Ross, & Rosser, 2007). The *Compulsive Sexual Behavior Inventory*, especially its control subscale, shares many themes with the SCS. Given that the only two validated measures of dysregulated sexuality highly overlap and both demonstrate good face validity, the SCS should be a valid measure of the construct.

The second explanation for the EFA results is that dysregulated sexuality overlaps with elevated sexual desire to such an extent that the two constructs are practically equivalent. If that is the case, the problem is not the inadequacy of the SCS, but instead is the way that dysregulated sexuality has been conceptualized. It may be that behaviours considered sexually compulsive such as protracted promiscuity, compulsive masturbation, pornography addiction and telephone sex dependence are merely a means of satisfying a very strong sexual appetite. Because those types of behaviour are considered inappropriate by social standards and can potentially interfere with daily functioning, there is a temptation to regard them as pathological.

Much of the previous research on dysregulated sexuality has evaluated its relationship with risky sexual behaviour. These studies have consistently shown that increased sexual compulsivity is associated with RSB (Benotsch et al., 1999; Benotsch et al., 2001; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman et al., 1997a; Kalichman et al., 1997b; Semple et al., 2006), although none of those studies controlled

for the effects of sexual desire. In our analyses, sexual compulsivity only correlated with one of the two markers of RSB: number of sexual partners in the past three months. On the other hand, the two sexual desire variables also correlated with both markers of RSB, and to a greater degree than sexual compulsivity. Increases in sexual desire were more strongly associated with RSB than sexual compulsivity. When we partialled out the effects of sexual desire from the relationship between sexual compulsivity and RSB, the correlation dropped below significance for men. In women, the association decreased although sexual compulsivity still weakly correlated with RSB. The RSB findings, in conjunction with the EFA results, indicate that sexual desire may account for the relationship between dysregulated sexuality and RSB established in previous research.

We acknowledge that our study design has some weaknesses, and therefore the findings should be interpreted with caution. The sample was not representative of the general population, despite its size. The large majority of participants were recruited through websites and print columns that would appeal to people who are likely younger, urban and more sexually liberal. Also, the question that we used to identify participants who had sought treatment for sexual compulsivity, impulsivity or addiction did not differentiate among those who had successfully completed treatment, those who did not, and those currently undergoing therapy. These three groups may have scored differently on the various measures, which could have affected the results of the comparisons with the non treatment groups and correlations within the group. Determining the specific treatment status will be important in future work on the nature of sexual dysregulation.

The overall goal of our study was to determine if dysregulated sexuality, as it is currently conceptualized and measured, and heightened sexual desire are distinct

constructs. We formulated four hypotheses which if confirmed, would provide converging evidence that the two constructs may not be distinguishable. The results supported the hypotheses and when taken together, they suggest that dysregulated sexuality, as it is currently conceptualized and measured, may simply be an indicator of elevated sexual desire and the distress associated with managing increased sexual thoughts, feelings and needs. This has implications for understanding the clinical presentation of dysregulated sexuality and may contribute to the debate on the merits of recognizing dysregulated sexuality as a clinical disorder. Finally, our findings may also influence future research on dysregulated sexuality and RSB. It could be beneficial to shift focus away from dysregulated sexuality and instead explore the role of mismanaged heightened sexual desire.

2.5 References

- American Psychiatric Association. (2000). *The diagnostic and statistical manual of mental disorders (4th ed., text revision)*. Washington, DC: Author.
- Anthony, D. T., & Hollander, E. (1993). Sexual compulsions. In E. Hollander (Ed.), *Obsessive compulsive-related disorders* (pp. 139-150). Washington: American Psychiatric Press, Inc.
- Bancroft, J., & Vukadinovic, Z. (2004). Sexual addiction, sexual compulsivity, sexual impulsivity, or what? Toward a theoretical model. *Journal of Sex Research, 41*(3), 225-234.
- Barth, R. J., & Kinder, B. N. (1987). The mislabelling of sexual impulsivity. *Journal of Sex and Marital Therapy, 13*(1), 15-23.
- Benotsch, E. G., Kalichman, S. C., & Kelly, J. A. (1999). Sexual compulsivity and substance use in HIV seropositive men who have sex with men: Prevalence and predictors of high-risk behaviors. *Addictive Behaviors, 24*(6), 857-868.
- Benotsch, E. G., Kalichman, S. C., & Pinkerton, S. D. (2001). Sexual compulsivity in HIV-positive men and women: Prevalence, predictors, and consequences of high-risk behaviors. *Sexual Addiction and Compulsivity: Journal of Treatment and Prevention, 8*(2), 83-99.
- Best, S. J., Krueger, B., Hubbard, C., & Smith, A. (2001). An assessment of the generalizability of internet surveys. *Social Science Computer Review, 19*(2), 131-145.
- Black, D. W. (1998). Compulsive sexual behavior: A review. *Journal of Practical Psychiatry and Behavioral Health, 4*(2), 219-229.

- Black, D. W. (2000). The epidemiology and phenomenology of compulsive sexual behavior. *CNS Spectrums*, 5(2), 26-35.
- Black, D. W., Kehrberg, L. L. D., Flumerfelt, D. L., & Schlosser, S. S. (1997). Characteristics of 36 subjects reporting compulsive sexual behavior. *American Journal of Psychiatry*, 154(2), 243-249.
- Bradford, J. M. W. (2001). The neurobiology, neuropharmacology and pharmacological treatment of the paraphilias and compulsive sexual behavior. *Canadian Journal of Psychiatry*, 46(1), 26-34.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford Press.
- Calkins, D. S. (1974). Some effects of non-normal distribution shape on the magnitude of the pearson product moment correlation coefficient. *Interamerican Journal of Psychology*, 8(3-4), 261-288.
- Call, V., Sprecher, S., & Schwarz, P. (1995). The incidence and frequency of marital sex in a national sample. *Journal of Marriage and the Family*, 57(3), 639-652.
- Carnes, P. J. (1983). *Out of the shadows: Understanding sexual addiction*. Minneapolis, MN: CompCare.
- Carpenter, D., Janssen, E., Graham, C., Vorst, H., & Wicherts, J. (in press). Women's scores on the Sexual Inhibition/Sexual Excitation Scales (SIS/SES): Gender similarities and differences. *Journal of Sex Research*.
- Cattell, R. B. (1966). The screens test for the number of factors. *Multivariate Behavioral Research*, 1(2), 245-276.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.

- Coleman, E. (1986). Sexual compulsion vs. Sexual addiction: The debate continues. *SIECUS Report*, 14(6), 7-11.
- Coleman, E. (1991). Compulsive sexual behavior: New concepts and treatment. *Journal of Psychology and Human Sexuality*, 4(2), 37-52.
- Coleman, E. (1992). Is your patient suffering from compulsive sexual behaviors? *Psychiatric Annals*, 22(6), 320-325.
- Coleman, E. (2003). Compulsive sexual behavior: What to call it, how to treat it? *SIECUS Report*, 31(5), 12-16.
- Coleman, E., Miner, M. H., Ohlerking, F., & Raymond, N. C. (2001). Compulsive Sexual Behavior Inventory: A preliminary study of reliability and validity. *Journal of Sex and Marital Therapy*, 27(4), 325-332.
- CompCare. (1987). *Hope and recovery: A twelve step guide for healing from compulsive sexual behavior*. Minneapolis, MN: Author.
- Comrey, A. L., & Lee, H. B. (1992). A first course in factor analysis (2nd ed.).
- Cox, M. K., & Key, C. H. (1993). Homogeneity of proportions post hoc pair-wise comparisons for the chi-square test of homogeneity of proportions. *Educational and Psychological Measurement*, 53(4), 952-962.
- Das, A. (2007). Masturbation in the United States. *Journal of Sex and Marital Therapy*, 33(4), 301-317.
- de Visser, R. O., Smith, A. M. A., Richters, J., & Rissel, C. E. (2007). Associations between religiosity and sexuality in a representative sample of Australian adults. *Archives of Sexual Behavior*, 36(1), 33-46.

- Derogatis, L. R. (1977). *The SCL-90-R manual I: Scoring administration and procedures for the SCL-90-R*. Baltimore: Clinical Psychometrics.
- Derogatis, L. R., & Melisaratos, N. (1979). The DSFI: A multidimensional measure of sexual functioning. *Journal of Sex and Marital Therapy*, 5(3), 244-281.
- Dixon, R., & Turner, R. (2007). Electronic vs. Conventional surveys. In R. A. Reynolds, R. Woods & J. D. Baker (Eds.), *Handbook of research on electronic surveys and measurements* (pp. 105-111). Hershey, PA: Idea Group Inc.
- Dodge, B., Reece, M., Cole, S. L., & Sandford, T. G. M. (2004). Sexual compulsivity among heterosexual college students. *Journal of Sex Research*, 41(4), 343-350.
- Dunlap, W. P., Burke, M. J., & Greer, T. (1995). The effect of skew on magnitude of product-moment correlations. *Journal of General Psychology*, 122(4), 365-377.
- Giargiari, T. D., Mahaffey, A. L., Craighead, W. E., & Hutchison, K. E. (2005). Appetitive responses to sexual stimuli are attenuated in individuals with low levels of sexual desire. *Archives of Sexual Behavior*, 34(5), 547-556.
- Gold, S. N., & Heffner, C. L. (1998). Sexual addiction: Many conceptions, minimal data. *Clinical Psychology Review*, 18(3), 367-381.
- Goodman, A. (1992). Sexual addiction: Designation and treatment. *Journal of Sex and Marital Therapy*, 18(4), 303-314.
- Goodman, A. (1993). Diagnosis and treatment of sexual addiction. *Journal of Sex and Marital Therapy*, 19(3), 225-242.
- Goodman, A. (1997). Sexual addiction: Diagnosis, etiology and treatment. In J. H. Lowenstein, R. B. Millman, P. Ruiz & J. G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 340-354). Baltimore: Williams & Wilkins.

- Hendrick, C., Hendrick, S. S., & Reich, D. A. (2005). The Brief Sexual Attitudes Scale. *Journal of Sex Research, 43*(1), 76-86.
- Holden, C. (2001). 'Behavioral' addictions: Do they exist? *Science, 294*(5544), 980-982.
- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002a). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring sexual inhibition and excitation proneness in men. *Journal of Sex Research, 39*(2), 114-126.
- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002b). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: II. Predicting psychophysiological response patterns. *Journal of Sex Research, 39*(2), 127-132.
- Kafka, M. P. (1994). Sertraline pharmacotherapy for paraphilias and paraphilia-related disorders: An open trial. *Annals of Clinical Psychiatry, 6*(3), 189-195.
- Kafka, M. P. (1997). Hypersexual desire in males: An operational definition and clinical implications for males with paraphilias and paraphilia-related disorders. *Archives of Sexual Behavior, 26*(5), 505-526.
- Kafka, M. P. (2000). The paraphilia-related disorders: Nonparaphilic hypersexuality and sexual compulsivity/addiction. In S. R. Lieblum & R. C. Rosen (Eds.), *Principles and practice of sex therapy* (3rd ed., Vol., pp. 471-503). New York: Guilford.
- Kafka, M. P. (2003). Sex offending and sexual appetite: The clinical and theoretical relevance of hypersexual desire. *Journal of Offender Therapy and Comparative Criminology, 47*(4), 439-451.
- Kafka, M. P., & Hennen, J. (1999). The paraphilia-related disorders: An empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. *Journal of Sex and Marital Therapy, 25*(4), 305-319.

- Kafka, M. P., & Hennen, J. (2003). Hypersexual desire in males: Are males with paraphilias different from males with paraphilia-related disorders? *Sexual Abuse: A Journal of Research and Treatment*, 15(4), 307-321.
- Kafka, M. P., & Prentky, R. (1992a). A comparative study of nonparaphilic sexual addictions and paraphilias in men. *Journal of Clinical Psychiatry*, 53(10), 345-350.
- Kafka, M. P., & Prentky, R. (1992b). Fluoxetine treatment of nonparaphilic sexual addictions and paraphilias in men. *Journal of Clinical Psychiatry*, 53(10), 351-358.
- Kalichman, S. C., & Cain, D. (2004). The relationship between indicators of sexual compulsivity and high risk sexual practices among men and women receiving services from a sexually transmitted infection clinic. *Journal of Sex Research*, 41(3), 235-241.
- Kalichman, S. C., Greenberg, J., & Able, G. G. (1997a). HIV-seropositive men who engage in high-risk sexual behavior: Psychological characteristics and implications for prevention. *AIDS Care*, 9, 441-450.
- Kalichman, S. C., Greenberg, J., & Able, G. G. (1997b). Sexual compulsivity among HIV positive men who engage in high-risk sexual behavior with multiple partners: An exploratory study. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Johnson, J. R., Adair, V., Rompa, D., Multhauf, K., & Kelly, J. A. (1994). Sexual sensation seeking: Scale development and predicting AIDS-risk behavior among homosexually active men. *Journal of Personality Assessment*, 62(3), 385-397.

- Kalichman, S. C., & Rompa, D. (1995). Sexual Sensation Seeking and Sexual Compulsivity Scales: Reliability, validity, and predicting HIV risk behavior. *Journal of Personality Assessment*, 65(3), 586-601.
- Kalichman, S. C., & Rompa, D. (2001). The Sexual Compulsivity Scale: Further development and use with HIV-positive persons. *Journal of Personality Assessment*, 76(3), 379-395.
- Kaplan, H. S. (1995). *The sexual desire disorders: Dysfunctional regulation of sexual motivation*. New York: Brunner/Mazel.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: Saunders.
- Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago, IL: University of Chicago Press.
- Le Gall, A., Mullet, E., & Shafighi, S. R. (2002). Age, religious beliefs, and sexual attitudes. *Journal of Sex Research*, 39(2), 207-216.
- Leedes, R. (2007). Compulsive or other problematic sexual behavior. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 365-381). Westport, CT: Praeger.
- Lefkowitz, E. S., Gillen, M. M., Shearer, C. L., & Boone, T. L. (2004). Religiosity, sexual behaviors, and sexual attitudes during emerging adulthood. *Journal of Sex Research*, 41(2), 150-159.
- Levine, S. B. (1987). More on the nature of sexual desire. *Journal of Sex and Marital Therapy*, 13(1), 35-44.

- Levine, S. B. (2003). The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*, 32(3), 279-285.
- Martin, P. R., & Petry, N. M. (2005). Are non-substance-related addictions really addictions? *American Journal on Addictions*, 14(1), 1-7.
- Meana, M., & Nunnink, S. E. (2006). Gender differences in the content of cognitive distraction during sex. *Journal of Sex Research*, 43(1), 59-67.
- Meng, X.-L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*, 111(1), 172-175.
- Meston, C. M., Heiman, J. R., Trapnell, P. D., & Paulhus, D. L. (1998). Socially desirable responding and sexuality self-reports. *Journal of Sex Research*, 35(2), 148-157.
- Meyerson, P., & Tryon, W. W. (2003). Validating internet research: A test of psychometric equivalence of internet and in-person samples. *Behavior Research Methods, Instruments and Computers*, 35(4), 614-620.
- Mick, T. M., & Hollander, E. (2006). Impulsive-compulsive sexual behavior. *CNS Spectrums*, 11(12), 944-955.
- Miner, M. H., Coleman, E., Center, B. A., Ross, M., & Rosser, B. R. S. (2007). The Compulsive Sexual Behavior Inventory: Psychometric properties. *Archives of Sexual Behavior*, 36(4), 579-587.
- Moser, C. (1993). A response to Aviel Goodman's 'sexual addiction: Designation and treatment'. *Journal of Sex and Marital Therapy*, 19(3), 220-224.

- O'Donohue, G. B. (2004). *Sex addiction, sexual compulsivity, and sexual impulsivity: A model for improving diagnosis and treatment of out-of-control sexual behaviors*. Fielding Graduate Institute.
- Oliver, M. B., & Hyde, J. S. (1993). Gender differences in sexuality: A meta-analysis. *Psychological Bulletin*, 114(1), 29-51.
- Paulhus, D. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology*, 46(3), 598-609.
- Paulhus, D. (1988). *Assessing self-deception and impression management in self-reports: The Balanced Inventory of Desirable Responding*. Vancouver, BC: University of British Columbia.
- Paulhus, D. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17-59). San Diego, CA: Academic Press, Inc.
- Raymond, N. C., Coleman, E., & Miner, M. H. (2003). Psychiatric comorbidity and compulsive/impulsive traits in compulsive sexual behavior. *Comprehensive Psychiatry*, 44(5), 370-380.
- Regan, P. C., & Atkins, L. (2006). Sex differences and similarities in frequency and intensity of sexual desire. 34(1), 95-102.
- Reynolds, R. A., Woods, R., & Baker, J. D. (Eds.). (2007). *Handbook of research on electronic surveys and measurements*. Hershey, PA: Idea Group Reference.
- Roberts, L. D. (2007). Equivalence of electronic and off-line measures. In R. A. Reynolds, R. Woods & J. D. Baker (Eds.), *Handbook of research on electronic surveys and measurements* (pp. 97-103). Hershey, PA: Idea Group Inc.

- Semple, S. J., Zians, J., Grant, I., & Patterson, T. L. (2006). Sexual compulsivity in a sample of HIV-positive methamphetamine-using gay and bisexual men. *AIDS and Behavior, 10*(5), 587-598.
- Shaffer, H. J., LaPlante, D. A., LaBrie, R. A., Kidman, R. C., Donato, A. N., & Stanton, M. V. (2004). Toward a syndrome model of addiction: Multiple expressions, common etiology. *Harvard Review of Psychiatry, 12*(6), 367 - 374.
- Spector, I. P., Carey, M. P., & Steinberg, L. (1996). The Sexual Desire Inventory: Development, factor structure, and evidence of reliability. *Journal of Sex and Marital Therapy, 22*(3), 175-190.
- Stein, D. J., Black, D. W., Shapira, N. A., & Spitzer, R. L. (2001). Hypersexual disorder and preoccupation with internet pornography. *American Journal of Psychiatry, 158*(10), 1590-1594.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. New York: HarperCollins.
- Tepper, M. S., Owens, A. F., Coleman, E., & Carnes, P. (2007). Current controversies in sexual health: Sexual addiction and compulsion. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 349-363). Westport, CT: Praeger/Greenwood.
- Travin, S. (1995). Compulsive sexual behaviors. *The Psychiatric Clinics of North America, 18*(1), 155-169.
- Wegner, D. M., Shortt, J. W., Blake, A. W., & Page, M. S. (1990). The suppression of exciting thoughts. *Journal of Personality and Social Psychology, 58*(3), 409-418.

- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*, 62(4), 615-640.
- Wiederman, M. W. (2004). Self-control and sexual behavior. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory and application* (pp. 525-536). New York: Guilford Press.

Chapter 3

Conscious regulation of sexual arousal in men²

3.1 Introduction

A small body of research indicates that men have some voluntary control over sexual arousal, as assessed using penile plethysmography (Abel, Blanchard, & Barlow, 1981a; Adams, Motsinger, McAnulty, & Moore, 1992; Freund, 1963, 1965, 1967; Golde, Strassberg, & Turner, 2000; Henson & Rubin, 1971; Laws & Rubin, 1969; Mahoney & Strassberg, 1991; McAnulty & Adams, 1991; Quinsey & Bergersen, 1976; Quinsey & Carrigan, 1978). This research was largely motivated by concern among forensic practitioners that sexual preference testing using the penile plethysmograph (PPG) may be vulnerable to faking by some sexual offenders. Sexual preference testing for sexual offenders is an essential component of comprehensive offender management, as inappropriate sexual preference (i.e., preference for sexual violence or underage targets) is a strong predictor of risk for reoffence (e.g., Hanson & Morton-Bourgon, 2004). The PPG, which is applied on the assumption that degree of erection is a valid peripheral indicator of central sexual arousal (e.g., Geer & Head, 1990), is currently the best measure of inappropriate sexual preference.

In past PPG faking studies, participants were asked to either suppress penile responses to preferred stimuli, maximize responses to nonpreferred stimuli, or both. Early evidence showed that arousal could be suppressed (Abel et al., 1981a; Freund, 1963, 1965, 1967; Quinsey & Bergersen, 1976; Quinsey & Carrigan, 1978). However, sample

² A version of this chapter has been submitted for publication. Winters, J., Christoff, K., and Gorzalka, B. B. (2007). Conscious regulation of sexual arousal in men. *Journal of Sex Research*.

sizes were very small and no techniques were used to control for distraction. It was quite possible that, when instructed to try to suppress arousal, participants merely distracted themselves from the stimuli by looking away from them, closing their eyes or focusing on sexually repulsive thoughts. This oversight was corrected in later, well-controlled studies (Henson & Rubin, 1971; Laws & Rubin, 1969; Mahoney & Strassberg, 1991; McAnulty & Adams, 1991). Various techniques were used to ensure that participants focused on the sexual stimuli presented. Such techniques included embedded signal detection tasks (e.g., button pressing in response to an embedded flashing dot), tests for stimulus content memory, and ongoing descriptions of sexual stimuli during presentation.

Findings from those studies reveal that men can suppress physiological and self-reported sexual arousal to preferred stimuli but are unable to enhance arousal to non preferred stimuli. Suppression rates range from 26% to 38% maximum erection, with some men able to entirely suppress their sexual arousal and others unable to suppress whatsoever (Adams et al., 1992; Golde et al., 2000; Mahoney & Strassberg, 1991; McAnulty & Adams, 1991). According to results reported by McAnulty and Adams (1991), men are more successful at suppressing cognitive than physiological arousal. McAnulty and Adams (1991) proposed that this was the result of “emotional distancing” (p. 574), and that participants processed the stimuli as cognitively arousing but were able to suppress physiological arousal. Similarly, men in the study performed by Adams et al. (1992) claimed that while they were unable to control cognitive arousal, they did experience a sense of control over penile response. During debriefing, participants in the Mahoney and Strassberg (1991) study were asked to describe techniques they used to

suppress, and most indicated that they tried to view the stimuli in as detached a way as possible.

From these comments, it seems that the tactic most effectively used to minimize physiological sexual arousal is emotional detachment (Mahoney & Strassberg, 1991; McAnulty & Adams, 1991). This is not surprising as emotional detachment is fundamental to emotion regulation (Gross, 1998a, 1998b, 1999, 2002; Ochsner & Gross, 2005), and various researchers and theorists have suggested that sexual arousal can be best understood within the rubric of emotional function (Everaerd, 1989; Everaerd, Laan, Both, & Spiering, 2001; Frijda, 1986; Geer, Lapour, & Jackson, 1993; Janssen & Everaerd, 1993; Janssen, Everaerd, Spiering, & Janssen, 2000; Lambie & Marcel, 2002; Rosen & Beck, 1988).

Emotions are distinct from moods in that they are incited by specific triggers. They are characterized by experiential, behavioural and physiological changes (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000). They may be unlearned responses to stimuli with intrinsic emotional value, or learned responses to stimuli with acquired emotional significance. Multiple appraisal processes can be involved in determining the reward value of emotion-inducing stimuli (Scherer, Schorr, & Johnstone, 2001). As sexual arousal is a response to external or imagined sexual stimuli, involves changes in both mental state and physiological systems, is reward-related and results in the experience of pleasure, it appears to meet the criteria for an emotion.

According to Gross (1998b), emotion regulation is the means by which individuals can influence their emotional responses. Through emotion regulation, individuals are able to exert control on which emotions they have, and how they

experience and express those emotions. Emotion regulation can be automatic or controlled and conscious or unconscious, and can occur during processing of emotional cues or after responses are activated. Gross (2002) suggested that two distinct processes may be at play: reappraisal and suppression. He defined reappraisal as the process by which a potentially emotion-eliciting situation is reframed in non-emotional terms. This can be accomplished by detaching oneself from, or reappraising the meaning of, an emotion eliciting stimulus. Lambie and Marcel (2002) described a similar process whereby an individual can regulate his or her emotional response to an emotion evoking stimulus by taking an objective perspective. Second-order awareness is maintained by remaining objectively observant rather than immersed in the experience. In this way, the individual is able to reflect upon the situation rather than become enmeshed within it; less emotional meaning is attributed to the stimulus and the experience is less emotionally charged.

Emotional suppression, on the other hand, does not change the emotional experience but does affect its expression (Gross, 2002). The behaviour that would normally follow the emotional experience is inhibited. Suppression is more cognitively taxing than reappraisal as the expressive behaviour must be muted while the emotional experience remains unchanged. While laboratory studies have shown that both reappraisal (Beauregard, Levesque, & Bourgouin, 2001; Jackson, Malmstadt, Larson, & Davidson, 2000; Lévesque, Eugène, Joanne et al., 2003; Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner, Ray, Cooper et al., 2004) and suppression (Colby, Lanzetta, & Kleck, 1977; Gross, 1998a; Gross & Levenson, 1993, 1997) are effective in regulating

emotional response, reappraisal appears to be a far more robust strategy in reducing emotional experience.

In the decade preceding the emergence of emotion regulation in the literature, Everaerd (1989) suggested a similar regulatory process with respect to sexual arousal. He proposed that voluntary control of sexual arousal is achievable when an individual can subdue emotional responses to sexual stimuli while still cognitively attending to them. In the only study to address this proposition directly, participants either attempted to inhibit sexual responses by detaching or distancing themselves from the sexual stimuli (i.e., reappraisal) or made no attempt to inhibit their sexual responses (Beauregard, Levesque & Bourgouin, 2001). Subsequently, participants were asked to self-report their sexual arousal. During stimulus presentation, functional magnetic resonance imaging (fMRI) identified regions of the brain implicated in regulation of sexual arousal. Participants self-reported 60% less sexual arousal when they attempted to inhibit sexual responses and inhibition of sexual arousal was associated with increased activation in cortical regions that have been associated with regulation of other emotions (Lévesque et al., 2003; Ochsner et al., 2002; Ochsner et al., 2004). Beauregard et al. (2001) did not include a physiological measure of sexual arousal so it is unclear how penile response was affected by sexual arousal regulation.

Although it has been established in the research literature that men, on average, have some voluntary control over their physiological sexual arousal, and that the tactic used most successfully to regulate arousal appears to be reappraisal (i.e., emotional detachment), no previous studies have provided participants with reappraisal strategy instructions, while also including measures of both self-reported and physiological sexual

arousal. One of the goals of our study is to address this issue. Since there appear to be individual differences in the ability to regulate other emotions (e.g., Jackson et al., 2000; Lévesque et al., 2003; Ochsner et al., 2004), we predicted that men would also vary in their capacity to regulate sexual arousal. We hypothesized that men's abilities to regulate sexual arousal would be related to their general emotion regulation capability. In other words, those men best able to regulate sexual arousal would be most adept at regulating other emotions. Given that self-reported sexual arousal correlates reasonably well with physiological arousal (Haywood, Grossman, & Cavanaugh, 1990; Sakheim, Barlow, Beck, & Abrahamson, 1985), we expected that the two measures would remain related when men attempted to regulate sexual arousal. This would provide evidence that sexual arousal regulation, as an application of emotion regulation, can affect both cognitive and physiological sexual response.

We also predicted that other factors associated with sexual responding might influence a man's ability to regulate his sexual arousal. Bancroft (1999b) proposed that sexual response is controlled by two independent neurophysiological systems: sexual excitation and sexual inhibition. Together, they modulate the affective, physiological and behavioural experiences that accompany sexual arousal. A strong sexual excitation system would contribute to robust sexual responding while a strong sexual inhibition system would reduce sexual response. Janssen, Bancroft and colleagues constructed the Sexual Excitation/Sexual Inhibition Scales (SES/SIS) to measure the strength of the sexual excitation and inhibition systems (Janssen, Vorst, Finn, & Bancroft, 2002a, 2002b). Items were created to describe situations that would increase or decrease sexual arousal and penile response. Those items clustered to form three subscales: (1) propensity

for sexual excitation; (2) propensity for sexual inhibition due to threat of performance failure (i.e., erectile failure); and (3) propensity for sexual inhibition due to threat of performance consequences (i.e., risk of sexually transmitted infections, pregnancy or legal repercussions). Research has shown that sexual excitation is associated with increased sexual responsivity in the laboratory, a greater frequency of sexual behaviours and increased partnered and solitary sexual desire (Bancroft & Vukadinovic, 2004; Janssen et al., 2002a, 2002b; Winters, Christoff, & Gorzalka, 2007). Sexual inhibition due to threat of performance consequences is inversely related to frequency of unprotected intercourse, and partnered and solitary sexual desire, and is positively associated with sexual restrictiveness. Based on these associations, we predicted that increased sexual excitation and decreased sexual inhibition would be related to poorer sexual arousal regulation performance. Similarly, we hypothesized that heightened dyadic sexual desire would also be related to decreased regulation success. An increased appetitive sexual drive and propensity for sexual excitation, in conjunction with muted sexual inhibition, should theoretically make it more difficult to regulate sexual arousal when one is confronted with sexually arousing stimuli.

Another factor which we hypothesized should be related to sexual arousal regulation is sexual compulsivity. Sexual compulsivity, or compulsive sexual behaviour, is characterized by disinhibited or under-controlled sexual thoughts, feelings and behaviours, as identified by the individual (Coleman, 2003; Kalichman & Cain, 2004). This may culminate in distress sufficient to instigate treatment seeking behaviour, as personal, social and/or occupational life is negatively affected. Research has linked sexual compulsivity with sexual behaviour that is illegal (e.g., Bradford, 2001; Kafka,

2003) or carries an increased risk for sexually transmitted infections (Benotsch, Kalichman, & Kelly, 1999; Benotsch, Kalichman, & Pinkerton, 2001; Dodge, Reece, Cole, & Sandford, 2004; Kalichman & Cain, 2004; Kalichman, Greenberg, & Abel, 1997a; Kalichman, Greenberg, & Abel, 1997b; Semple, Zians, Grant, & Patterson, 2006). Although we were unable to distinguish sexual compulsivity from sexual desire in a previous study (Winters et al., 2007), it is possible that sexual compulsivity is related to a deficit in sexual arousal regulation.

Anecdotal evidence suggests that as men get older and gain sexual experience, they become better able to control their sexual response. For this reason, we measured sexual experience and age as variables that may relate to sexual arousal regulation.

Based on the research reviewed and the resulting predictions, we formulated four hypotheses: (1) self reported sexual arousal will correlate with physiological sexual arousal, as measured by penile plethysmography (PPG), during both experience and regulation trials; (2) men will exhibit a range of physiological and self reported sexual arousal regulation success; (3) sexual arousal regulation success will correlate positively with age, sexual experiences and sexual inhibition, and negatively with sexual excitation, sexual desire and sexual compulsivity; and (4) those men who are best at regulating their sexual arousal will also be the best at regulating another emotional response, amusement.

To test these hypotheses, we designed a two part study. Men first completed a series of sexuality questionnaires that measure the factors of interest described above. The questionnaires were completed online as online surveys are more convenient and may result in increased disclosure (Schroder, Carey, & Venable, 2003). Online measures appear to be as valid as, and can perform in a similar manner to, traditional pencil-and-

paper measures (Dixon & Turner, 2007; Meyerson & Tryon, 2003; Roberts, 2007). Participants were subsequently assessed for arousal regulation success in the laboratory. Regulation instructions obtained from the emotion regulation literature were provided. Two stimulus conditions, erotic and humourous, were crossed with two instruction conditions, experience or regulate, to produce four possible trial types. Psychophysiological and self-reported arousal across the trial types were compared and correlated with scores on the survey measures.

3.2 Method

3.2.1 Participants

Forty-nine sexually functional men who were free of medication that may affect sexual response participated in the study. Their average age was 27.7 ($SD = 10.1$) and ranged from 18 to 67. Their median and modal age was 24. Sixty-five percent of the participants were Caucasian, 20% were East Asian, 4% were South Asian, 4% were Latin American and 6% were of another ethnicity. The majority of participants identified as heterosexual ($N = 44$; 90%) although there was a small group of men who identified as bisexual ($N = 5$; 10%). Most participants were in exclusive sexual relationships ($N = 28$; 57%); the rest were in non exclusive sexual relationships ($N = 4$; 8%) or were not in a sexual relationship at the time of the study ($N = 17$; 35%). Slightly less than half the sample was comprised of undergraduate students (47%). All participants except one reported masturbating at least once per week. The sample's average weekly masturbation frequency over the preceding three months was 6.0 ($SD = 6.9$). The majority (87.7%) of the sample reported viewing pornography on at least a weekly basis. The average amount

of time devoted to viewing pornography per week over the preceding three months was 2.4 hours ($SD = 2.0$). A small minority of the sample ($N = 4$; 8.2%) had never experienced any partnered sexual activity, although three of those participants viewed pornography and masturbated at least once per week.

3.2.2 Procedure

Participants were recruited by three means. A link provided at the end of the online survey used in Winters, Christoff and Gorzalka (2007) briefly described the study and provided contact information for those interested in participating. We also posted a study advertisement on the University of British Columbia Department of Psychology Subject Pool Psychology Research Participation System. As a final means of recruitment, advertisements were posted around Vancouver and the University of British Columbia (UBC) campus. Participants were given \$30 remuneration upon completion of the entire study. Undergraduate students who were eligible for course credit were offered a choice of either two course credits or the \$30 remuneration; only one chose the credits.

Both the online survey and the laboratory testing were approved by the University of British Columbia Behavioural Research Ethics Board. The online survey included: an online consent form, a demographics and general information questionnaire, four sexuality measures, and a results and debriefing page. With the exception of the *Demographics and General Information Form* which always appeared first, the survey measures were presented randomly. The set of questionnaires took approximately 45 minutes to complete. A more detailed description of the survey procedure can be found in Winters, Christoff and Gorzalka (2007).

The second part of the study was conducted at a UBC laboratory. Upon participants' arrival at the laboratory, the procedure and instructions were explained in detail and participants were given the opportunity to examine the PPG apparatus and ask questions. Before testing began, participants were required to sign a consent form. They were also asked to provide rudimentary demographic information so that each participant's survey data could be linked with his laboratory data.

In the laboratory, we set up a private testing room with a lounge chair placed four feet back from the video presentation television. Headphones for audio stimuli and a numeric keypad for self-report responses were connected to the testing laptop, located outside the testing room. Two clean towels were provided for each participant, one to sit on and the other to be placed over his lap. An inflatable seat pad, connected to the data acquisition laptop, allowed us to monitor participants' movements during data acquisition. Participant movement can tug the strain gauge lead creating spikes in the PPG penile circumference data. During post processing, data spikes that were artefacts of participant movement were removed.

After written informed consent was obtained and the instructions had been given, participants were asked to enter the PPG testing room, pull their pants down around their ankles, be seated, fit the gauge, cover themselves with a towel and put on the headphones. When the participants indicated that they were comfortable, testing began.

Participants viewed 16 randomly ordered video clips: eight erotic and eight humorous (control). Before each of the clips was presented, either 'Experience' or 'Regulate' was displayed on the television screen. These acted as task cues, corresponding to instructions borrowed from the emotion regulation literature

(Beauregard et al., 2001; Gross, 2002; Jackson et al., 2000; Lévesque et al., 2003). For experience trials, participants were instructed to become immersed in the video stimuli as they normally would. For the erotic and humourous regulate trials, participants were instructed to detach or disengage themselves from the stimuli by taking a distanced or objective point of view. The instruction cues were ordered randomly; however, they were balanced across stimulus conditions so that half of both the erotic and humourous clips were experience and the other half were regulate. To insure that participants did not manipulate their responses during the regulate trials by closing their eyes, looking away or imagining something that would reduce their responses, they were told that they would be asked to recount various aspects of the video scenarios.

At the end of each trial, participants were instructed, by text messaging on the television screen, to self-report maximum level of sexual arousal, erection and amusement. Responses for sexual arousal ranged from 0 (*not sexually aroused at all*) to 9 (*maximally sexually aroused*). Responses for degree of erection ranged from 0 (*no erection at all*) to 9 (*maximally erect*). Responses for amusement ranged from 0 (*not at all amused*) to 8 (*maximally amused*). After each erotic trial, time was given for penile tumescence to return to baseline before the next trial began. Once testing was complete, subjects were debriefed and given a chance to ask questions about the study.

3.2.3 Stimuli

We used a two-stage process to select the erotic video clips. First, we had 75 male volunteers select their top ten preferences from a list of 41 actor traits and sexual behaviours that are typical of commercial pornography. We summed those preferences and then used the eight most frequently endorsed to guide selection of erotic videos.

Those eight preferences were: attractiveness of the female actor – body; attractiveness of the female actor – face; female actor exhibiting sexual pleasure; vaginal sex – female on hands and knees (i.e., 'doggy style'); oral sex – male recipient; male ejaculating on the female's face (i.e., 'facial cum shot'); and vaginal sex – female on top facing male (i.e., 'cowgirl'). Over two hundred videos were downloaded from an online commercial pornography links site. The videos were vetted for content and quality. Eighteen were selected, based on the eight preferences, to be edited into three minute clips. The amount of time devoted to each type of sexual behaviour was balanced across the 18 video clips. The video clips were dispersed as randomly ordered sets, saved onto two CDs, to 20 male volunteers. Volunteers rated each video clip on a scale from 1 (*not at all arousing*) to 9 (*maximally arousing*) and then returned their ratings to our laboratory by mail, in self-addressed envelopes that were provided. We averaged ratings for each video clip across volunteers and then used repeated measures analysis of variance to determine which eight video clips would be used for the experiment. The ratings for the eight video clips that were chosen did not differ significantly from each other. Comedy clips were selected in a similar fashion. We perused various internet comedy sites and noted names of stand up comics that were rated most amusing. Video clips of those performers were screened for content. A comedian named Mitch Hedberg was chosen for two reasons. First, his jokes do not contain any sexual content, which was a necessary criterion for the control condition stimuli. Second, his jokes are short, making it easy to edit three minute clips from his performances. As with the erotic clips, CD compilations of 12 Mitch Hedberg clips were distributed to 20 volunteers who rated each clip on a scale of 1 (*not at all*

amusing) to 9 (*maximally amusing*). Based on the ratings, eight clips were selected that did not differ significantly from each other.

3.2.4 Measures

3.2.4.1 Demographics and General Information Form (DGIF). The DGIF was based on measures used in online sexuality studies at Indiana University's Kinsey Institute (<http://www.kinseyinstitute.org/research/surveylinks.html>). Although it is comprised of 22 items, data from only 8 items were of interest for the purposes of this study. Those items assessed: age, sex, language, ethnicity, sexual experience, sexual identity, relationship status and undergraduate status.

3.2.4.2 Sexual Compulsivity Scale (SCS). The SCS (Kalichman, Johnson, Adair et al., 1994; Kalichman & Rompa, 1995, 2001) is a 10-item measure of sexual compulsivity. The SCS items (e.g., 'I sometimes get so horny I could lose control', 'I feel that sexual thoughts and feelings are stronger than I am' and 'I have to struggle to control my sexual thoughts and behaviour') capture sexual preoccupations and undercontrolled sexual thoughts and feelings which are core to the current understanding of sexual compulsivity. The responses for each item, ranging from 1 (*not at all like me*) to 4 (*very much like me*), are summed and divided by ten to give an overall sexual compulsivity score. The SCS has good internal consistency, with Cronbach's alpha coefficients ranging from .82 - .95, and is the only measure of sexual compulsivity that has been both well validated and widely used in previous research (Dodge et al., 2004; Kalichman et al., 1994; Kalichman & Rompa, 1995, 2001).

3.2.4.3 Sexual Excitation/Sexual Inhibition Scales (SES/SIS). The SES/SIS (Janssen et al., 2002a, 2002b) is a 45-item measure designed to assess the

strength of the sexual excitation and inhibition systems under various circumstances. Responses for each SES/SIS item range from 1 (*strongly agree*) to 4 (*strongly disagree*) and after reverse keying some items, responses are summed to form three subscale scores: (1) propensity for sexual excitation (SES; range 20-80); (2) propensity for sexual inhibition due to threat of performance failure (SIS1; range 14-56); and (3) propensity for sexual inhibition due to threat of performance consequences (SIS2; range 11-44). Internal consistency for the three subscales is good (Cronbach's alphas = .88, .82, and .66; Janssen et al., 2002a). Scores on the scales appear to be stable over time and normally distributed (to date, over 2500 men have been tested; Bancroft & Vukadinovic, 2004).

During analysis, we included scores from the SES and SIS2 scales only since inhibition due to fear of performance failure, as captured by SIS1, measures sexual dysfunction which was not related to any of our hypotheses.

3.2.4.4 Sexual Desire Inventory-2 (SDI-2). The SDI-2 (Spector, Carey, & Steinberg, 1996) is a 14-item self-report test of interest in partnered and solitary sexual activity. Each item is scored on a nine-point scale and responses are summed to produce an overall score ranging from 0 to 112. Scoring the SDI-2 also produces two subscale scores: dyadic sexual desire (SDI2-DSD) and solitary sexual desire (SDI2-SSD). Cronbach's alphas for the two factors are .86 and .96, respectively. As there is no theoretical reason to believe that solitary sexual desire is related to sexual arousal regulation, we included only dyadic sexual desire in analyses.

3.2.4.5 Derogatis Sexual Functioning Inventory - Sexual Experiences Subtest (DSFI-SE). The DSFI-SE is one of ten self-report subtests of the Derogatis Sexual Functioning Inventory (Derogatis & Melisaratos, 1979). It lists 24 sexual

behaviours (e.g., ‘deep kissing’, ‘oral stimulation of your partner’s genitals’ and ‘intercourse – you in superior position’) and the individual being assessed indicates which of those he or she has experienced ever, and experienced in the preceding 60 days. Items endorsed are summed to create two scores out of 24. Internal consistency for the DSFI-SE is excellent (Cronbach’s $\alpha = .97$; Derogatis & Melisaratos, 1979).

3.2.4.6 Penile Plethysmography. Physiological sexual arousal was measured with a PPG purchased from Limestone Technologies (Kingston, Ontario). The PPG assesses the change in penile tumescence that corresponds to the relative degree to which a man is sexually aroused. Penile circumference is measured using a mercury-in-rubber strain gauge placed two thirds of the way down the shaft of the penis. As tumescence increases, the mercury column in the strain gauge is stretched thinner, changing its cross-sectional circumference. Electrical resistance of mercury is directly related to its cross-sectional area; therefore, any change in tumescence results in a concomitant change in electrical resistance. The mercury-in-rubber PPG strain gauge is calibrated for precise measurement and small changes in resistance can be translated into millimetre changes in penile circumference. Data from the strain gauge are relayed, via a transducer, to a testing laptop computer. Limestone provided us with software that displays, records and tabulates the incoming time-sequenced PPG data. Peak minus baseline scores were used to determine maximum millimetre changes in circumference during each trial (Abel, Blanchard, Murphy, Becker, & Djenderedjian, 1981b; Kuban, Barbaree, & Blanchard, 1999). Based on the recommendation of Kuban, Barbaree and Blanchard (1999), we used a threshold of three millimetre changes to signify interpretable arousal.

3.2.5 Data Analysis

Physiological and self-report responses were averaged over trials of the same type (i.e., erotic-experience; erotic-regulate; humorous-experience; and humorous-regulate). For the erotic stimuli, the two instruction conditions (i.e., experience and regulate) were crossed with three possible responses to produce six outcome variables. For the humorous stimuli, the two instruction conditions were crossed with self-reported amusement to produce two outcome variables. Paired samples *t*-tests were conducted to determine differences in outcome variables between the instruction conditions. Small, medium and large effect sizes were interpreted according to Cohen's recommended cutoffs of 0.2, 0.5 and 0.8, respectively (Cohen, 1992).

Regulation indices were calculated by dividing average response during regulate trials by average response during experience trials. The resulting values were each multiplied by 100 to create four percentage regulation success indices: sexual arousal regulation success index – PPG peak-base (SAI-PB); sexual arousal regulation success index – self-reported maximum arousal (SAI-SRMA); sexual arousal regulation success index – self-reported maximum erection (SAI-SRME); and amusement regulation success index – self-reported amusement (AMI-SRA).

To address hypotheses three and four, we calculated Pearson correlation coefficients for the variables of interest. To interpret the strength of those correlations, we adhered to Cohen's (1992) suggestion that coefficients of 0.1, 0.3 and 0.5 indicate the lower bounds of small, medium and large correlation effect sizes. After correlation coefficients had been calculated for the variables of interest, we partialled out the effects of sexual desire and sexual excitation from the correlations between sexual compulsivity

and the three sexual arousal regulation success indices to insure that sexual desire and sexual excitation were not accounting for any possible relationship between sexual compulsivity and sexual arousal regulation success.

3.3 Results

All participants exhibited increased penile tumescence (i.e., greater than three millimetre changes in penile circumference) to the erotic stimuli and no sexual response to the humour stimuli. Therefore, all assessments were deemed valid and data from the 49 participants were included in analyses. Descriptive statistics for the survey measures are presented in Table 3.1. The results of paired samples *t*-tests, with corresponding effect sizes, for regulate versus experience trials, can be found in Table 3.2.

Participants, on average, were able to regulate their sexual arousal according to all three outcomes (i.e., PPG, self-report sexual arousal and self-report erection). On average, they were also able to regulate their amusement during humour-regulate trials. The effect sizes for PPG peak-base, self-reported proportion full erection and self-reported amusement paired samples *t*-tests were moderate, while that for self-reported sexual arousal experience-regulation comparison was large.

Descriptive statistics for the regulation success indices can be found in Table 3.3. Lower index values indicate increased regulation success. The mean regulation indices scores did not differ significantly from each other, $F = 1.69(1)$, $p = 0.20$. There was large

Table 3.1 Survey Measure Descriptive Statistics

	Mean	<i>SD</i>	Range
SCS	1.7	0.6	1 – 3.8
SES	58.7	6.5	42 – 70
SIS2	28.2	5.2	17.5 – 39
SDI2-DSD	43.4	7.5	21 – 62
DSFI – Sexual Experiences	19.6	6.2	0 – 24
DSFI – Sexual Experiences Past 60 Days	14.3	8.7	0 – 24

Note. SCS = sexual compulsivity; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences; SDI2-DSD = dyadic sexual desire; DSFI = Derogatis Sexual Functioning Inventory.

Table 3.2 Descriptive Statistics and Paired Samples t-Tests for Experience Versus Regulate Trials

Outcome Variable	Mean	<i>SD</i>	Minimum	Maximum	<i>t</i> (48)	<i>p</i>	Cohen's <i>d</i>
EE-PPG	27.7	12.2	4.67	55.4	5.39	< .001	0.55
ER-PPG	21.0	12.3	2.79	49.9			
EE-SRSA	5.6	1.7	2.3	8.5	7.33	< .001	0.81
ER-SRSA	4.3	1.5	1.3	7.0			
EE-SRFE	5.5	2.1	1.3	8.5	6.46	< .001	0.73
ER-SRFE	4.1	1.7	1.3	8.3			
HE-SRA	5.0	1.6	1.8	7.5	5.99	< .001	0.67
HR-SRA	4.0	1.4	1.5	7.5			

Note. EE-PPG = erotic-experience PPG peak-base millimeters circumference change; ER-PPG = erotic-regulate PPG peak-base millimeters circumference change; EE-SRSA = erotic-experience self-reported maximal sexual arousal; ER-SRSA = erotic-regulate self-reported maximal sexual arousal; EE-SRFE = erotic-experience self-reported maximum proportion full erection; ER-SRFE = erotic-regulate self-reported maximum proportion full erection; HR-SRE = humourous-experience self-reported amusement; HR-SRA = humourous-regulate self-reported amusement.

Table 3.3 Descriptive Statistics for Regulation Success Indices (Percentage Regulation Success)

Index	Mean	SD	Minimum	Maximum
SAI-PB	75.2	25.4	17.6	118.6
SAI-SRMA	79.2	19.5	45.5	133.3
SAI-SRME	78.1	26.0	38.5	180.0
AMI-SRA	83.6	26.2	33.3	200.0

Note. SAI-PB = sexual arousal regulation success index – PPG peak-base; SAI-SRMA = sexual arousal regulation success index – self-reported maximum arousal; SAI-SRME = sexual arousal regulation success index – self-reported maximum erection; AMI-SRA = amusement regulation success index – self-reported amusement.

variation in all four regulation indices scores. The highest penile response regulation index score was 17.6%, indicating that the participant who was best able to regulate his physiological response exhibited an 82.4% decrease in erectile response during erotic-regulate trials. The highest regulation indices scores for self-reported sexual arousal, self-reported proportion of full erection and self-reported amusement were 45.5%, 38.5% and 33.3%, respectively. No single participant scored highest on more than one index.

Despite the fact that on average, participants were able to regulate their arousal, some participants reported and demonstrated increased sexual arousal during erotic-regulate trials. The penile responses of eight participants (16.3%) were greater during erotic-regulate trials than during erotic-experience trials. The least successful regulator was, on average, 18.6% more responsive during regulate trials. The self-reported sexual arousal responses for five participants (10.2%) were greater during erotic-regulate trials than during erotic-experience trials, with the lowest scoring participant reporting 33.3% more sexual arousal in the regulate condition. The self-reported maximum proportion full erection responses for six participants (12.2%) were greater during erotic-regulate trials than during erotic-experience trials. Similarly, the least successful regulator self-reported 80.0% greater erectile response during the regulate trials. A similar pattern was evident for the humour condition. Seven (14.3%) participants reported more amusement, on average, during the humour-regulate trials than during the humour-experience trials. The participant least able to regulate reported 100% more amusement in the regulate condition.

Across both erotic-experience and erotic-regulate conditions, physiological sexual arousal, self-reported sexual arousal and self-reported proportion of full erection were all

significantly and positively intercorrelated (see Tables 3.4 and 3.5). The effect sizes for all correlations were large.

As is shown in Table 3.6, the PPG peak-base regulation success index correlated with both self-reported maximum sexual arousal and self-reported maximum erection regulation success indices. Those correlations were of large effect size. Self-reported maximum sexual arousal and self-reported maximum erection indices also correlated very strongly with each other. The PPG peak-base index did not correlate with the self-reported amusement index; however, the self-reported maximum amusement regulation index correlated with both self-reported maximum sexual arousal and self-reported maximum erection indices. These correlations were of medium effect size.

The correlation results for the survey measures and regulation success indices are presented in Table 3.7. The PPG peak-base index correlated negatively with sexual inhibition due to fear of performance consequences. The correlation coefficient was of large effect size. There was a trend towards significance for the correlations between sexual inhibition and both the self-reported maximum sexual arousal and self-reported maximum erection regulation success indices. The PPG peak-base regulation index did not correlate significantly with any other variables of interest. Self-reported maximum sexual arousal and self-reported maximum erection regulation indices correlated with dyadic sexual desire and sexual excitation; these correlations were all of moderate effect size. The amusement regulation did not correlate with any of the sexuality variables. Age and sexual experiences did not correlate with any of the regulation success indices.

Only the self-reported maximum erection regulation success index correlated with sexual compulsivity. The correlations for sexual compulsivity with the other two sexual

Table 3.4 Correlation Coefficients for Erotic – Experience Sexual Arousal

Responses		
	EE-PPG	EE-SRSA
EE-SRSA	.562**	-
EE-SRFE	.604**	.923**

Note. EE-PPG = erotic-experience PPG peak-base millimeters circumference change; EE-SRSA = erotic-experience self-reported maximal sexual arousal; EE-SRFE = erotic-experience self-reported maximum proportion full erection; ** $p < .001$.

Table 3.5 Correlation Coefficients for Erotic – Regulate Sexual Arousal

Responses		
	ER-PPG	ER-SRSA
ER-SRSA	.598**	-
ER-SRFE	.685**	.873**

Note. ER-PPG = erotic-regulate PPG peak-base millimeters circumference change;
 ER-SRSA = erotic- regulate self-reported maximal sexual arousal; ER-SRFE =
 erotic- regulate self-reported maximum proportion full erection; ** $p < .001$.

Table 3.6 Correlation Coefficients for Regulation Success Indices

	SAI-PB	SAI-SRMA	SAI-SRME
SAI-SRMA	.515 $p < .001$	-	-
SAI-SRME	.515 $p < .001$	.846 $p < .001$	-
AMI-SRA	.226 $p = .119$	.368 $p = .010$	.329 $p = .022$

Note. SAI-PB = sexual arousal regulation success index – PPG peak-base; SAI-SRMA = sexual arousal regulation success index – self-reported maximum arousal; SAI-SRME = sexual arousal regulation success index – self-reported maximum erection; AMI-SRA = amusement regulation success index – self-reported amusement.

Table 3.7 Correlation Coefficients for Survey Measures and Regulation Success Indices

	SAI-PB	SAI-SRMA	SAI-SRME	AMI-SRA
Age	.077 <i>p</i> = .600	.217 <i>p</i> = .139	.254 <i>p</i> = .081	.047 <i>p</i> = .747
DSFI-SE	.153 <i>p</i> = .294	.118 <i>p</i> = .425	.245 <i>p</i> = .093	.023 <i>p</i> = .876
DSFI-SE60	-.021 <i>p</i> = .888	-.094 <i>p</i> = .524	.120 <i>p</i> = .418	-.110 <i>p</i> = .451
SDI2-DSD	.091 <i>p</i> = .533	.332* <i>p</i> = .021	.375** <i>p</i> = .009	.245 <i>p</i> = .089
SES	.253 <i>p</i> = .079	.289* <i>p</i> = .047	.301* <i>p</i> = .037	-.047 <i>p</i> = .748
SIS2	-.506** <i>p</i> < .001	-.273 <i>p</i> = .061	-.205 <i>p</i> = .161	-.175 <i>p</i> = .230
SCS	.132 <i>p</i> = .367	.216 <i>p</i> = .140	.326* <i>p</i> = .024	.143 <i>p</i> = .328

Note. DSFI-SE = sexual experiences; DSFI-SE60 = sexual experiences past 60 days; SDI2-DSD = dyadic sexual desire; SES = sexual excitation; SIS2 = sexual inhibition due to fear of performance consequences; SCS = sexual compulsivity; SAI-PB = sexual arousal regulation success index – PPG peak-base; SAI-SRMA = sexual arousal regulation success index – self-reported maximum arousal; SAI-SRME = sexual arousal regulation success index – self-reported maximum erection; AMI-SRA = amusement regulation success index – self-reported amusement; **p* < .05; ***p* < .01.

arousal regulation success indices did not reach statistical significance but were in the predicted direction. When we partialled out the effects of sexual desire and sexual excitation, the strength of the correlations all decreased considerably (see Table 3.8) and the correlation between self-reported maximum erection regulation success index and sexual compulsivity dropped below statistical significance.

3.4 Discussion

The overall purpose of this study was to examine the effectiveness of emotional reappraisal in regulating male sexual arousal. Results showed that men, on average, were somewhat able to regulate their physiological and cognitive sexual arousal, although there was a wide range of regulation success. While some men were very adept at regulating their sexual arousal, others became more sexually aroused while trying to regulate. Further, the results indicate that the ability to regulate emotion crosses emotional domains; those men best able to regulate sexual arousal were also the most skilled at regulating amusement. Age, sexual experience and sexual compulsivity were unrelated to sexual arousal regulation. Conversely, sexual excitation, inhibition and desire correlated with sexual arousal regulation success. Increased sexual excitation and desire were associated with poorer regulatory performance while a propensity for sexual inhibition due to fear of performance consequences was related to regulatory success.

As hypothesized, the regulation success indices for both self-reported sexual arousal and perceived degree of erection were positively associated with amusement regulation success. It appears, therefore, that one's ability to regulate emotion crosses emotional domains. The correlation between the PPG peak-base regulation success index

Table 3.8 Zero-Order and Partial Correlation Coefficients for Sexual Compulsivity and Sexual Arousal Regulation Success Indices

	SAI-PB	SAI-SRMA	SAI-SRME
SCS ¹	.132 ¹ <i>p</i> = .367	.216 ¹ <i>p</i> = .140	.326 ¹ <i>p</i> = .024
SCS ²	.087 ² <i>p</i> = .564	.069 ² <i>p</i> = .648	.183 ² <i>p</i> = .224

Note. ¹ zero-order correlation coefficients; ² partial correlation coefficients

controlling for the effects of sexual desire and sexual excitation; SCS = sexual

compulsivity; SAI-PB = sexual arousal regulation success index – PPG peak-base;

SAI-SRMA = sexual arousal regulation success index – self-reported maximum

arousal; SAI-SRME = sexual arousal regulation success index – self-reported

maximum erection.

and amusement regulation success index, however, did not reach statistical significance, indicating that there may be imperfect concordance between cognitive and physiological sexual arousal. This is consistent with previous research showing that concordance between self-reported sexual arousal and penile response is good, at best (Haywood et al., 1990; Sakheim et al., 1985).

Men in our sample were, on average, able to regulate their physiological sexual arousal when instructed to do so. During erotic-regulate trials, they exhibited a 25% reduction in erectile response. This is consistent with success rates from previous well-controlled PPG faking studies, in which success rates range from 26% to 38% (Adams et al., 1992; Golde et al., 2000; Mahoney & Strassberg, 1991; McAnulty & Adams, 1991). Some men in the two studies performed by McAnulty, Adams and colleagues were able to wholly suppress their penile response, whereas all of the participants in our study and the study by Mahoney and Strassberg (1991) exhibited some physiological arousal during regulate trials. We suspect that stimulus modality may account for this discrepancy. McAnulty, Adams and colleagues used slides and accompanying audio vignettes, while both we and Mahoney and Strassberg (1991), used video stimuli. Video stimuli are more arousing than slides or audio stimuli (Abel et al., 1981a; Julien & Over, 1988; Sakheim et al., 1985), likely increasing the difficulty of sexual arousal regulation.

Participants in our study self-reported 21% less sexual arousal and 22% less perceived erectile response during erotic-regulate trials. These results are also within the range of results reported in previous PPG studies. However, they are substantially different from those described by Beaugard et al. (2001). Their sample self-reported a 60% reduction in sexual arousal during regulate trials despite the fact that video stimuli

were utilized. This disparity may reflect the different testing environments, as participants were lying inside the bore of an MRI scanner. The scanner environment is quite uncomfortable and the considerable noise during scanning - which can reach 130 to 140 decibels - is distracting, even with hearing protection. Discomfort and distraction may have made it easier to regulate arousal.

Men in our sample exhibited a very wide range of regulation success across all four response types: physiological sexual response, self-reported sexual arousal, perceived degree of erection and amusement. Surprisingly, some men self-reported and exhibited increased sexual arousal and penile response during the regulate trials. The same was true for self-reported amusement during humour-regulate trials. We considered two possible explanations for this increased responding: regulatory depletion and anxiety's potentially augmenting effect on sexual arousal.

Our stimuli, which were each three minutes long to allow for full sexual response, were of substantially longer duration than those used in previous emotion regulation research (e.g., Beauregard et al., 2001; Jackson et al., 2000; Ochsner et al., 2002; Ochsner et al., 2004) . It is possible that emotion regulation, for some individuals, is only effective over a short period of time, after which emotion regulation resources become depleted. The results from a study of sexual self-restraint and regulatory depletion by Gailliot and Baumeister (2007) provide some support for this explanation. They found that participants had more difficulty with sexual restraint (i.e., inhibiting sexual thoughts and behaviours) following regulatory tasks compared to control tasks.

Depletion of regulatory resources does not explain, however, why responses increased during regulate trials for some men. During debriefing, we asked participants to

describe their experiences during testing and how well they felt that they were able to regulate. None of the men who exhibited increased responding during regulate trials mentioned that they found it increasingly difficult to regulate towards the ends of each video clip and as the entire testing session progressed. A visual inspection of the PPG traces corroborated their accounts, as the traces for their regulate trials looked similar to their experiences trials. In other words, there did not appear to be regulation of penile responding within regulate trials that abated towards the end of each of the trials. Additionally, penile response during regulate trials did not seem to increase as testing progressed, which would have been indicative of regulatory depletion across the entire testing sessions.

Some of the men who exhibited increased responding in the regulate condition reported that they became more enmeshed in the stimuli while trying to regulate. In conjunction with the PPG traces, this suggested that something other than regulatory depletion was happening. The other possible explanation for increased responding is based on findings from research on emotional control and thought suppression. In one of the first studies of thought suppression, Wegner and colleagues (1987) instructed participants not to think of a white bear and then monitored their thoughts over the following five minutes. Initially all participants were unable to rid their minds of a white bear. As the trial proceeded, however, some participants were able to stop the thoughts while others were not. In a follow-up study, participants were asked to try not to think of emotionally charged sexual thoughts (Wegner, Shortt, Blake, & Page, 1990). They found that attempted thought suppression and intrusive sexual thoughts, arising after initial thought suppression success, increased sympathetic arousal. Based on their findings, they

concluded that “suppression of exciting thoughts can undermine the process of emotional control” (pg. 415). They posited that the mere act of trying to suppress exciting thoughts increases excitement, which then intensifies the initial emotional response. The cycle of attempted suppression, increased emotional response followed by more attempts at suppression causes the emotional response to become more robust. Thus, attempted control has the exact opposite effect than intended. Perhaps, for a small minority of our participants, being attuned to and attempting to regulate sexual arousal and humour actually increased responses.

This type of response amplification may be related to the well established link between sympathetic arousal and increased sexual interest and response (Bancroft, Janssen, Strong et al., 2003a; Bancroft, Janssen, Strong, & Vukadinovic, 2003b; Barlow, Sakheim, & Beck, 1983; Dutton & Aron, 1974; Extona, Truong, Exton et al., 2000; Heiman & Rowland, 1983; Krüger, Exton, Pawlak et al., 1998; Krüger, Schiffer, Eikermann et al., 2006; Meston & Gorzalka, 1995, 1996; Meston & Heiman, 1998; Palace & Gorzalka, 1990; Wolchik, Beggs, Wincze et al., 1980). Increased anxiety can have an augmenting effect, via the sympathetic nervous system, on sexual response, particularly for women. In men, results are more mixed (Barlow, Sakheim & Beck, 1983; Farkas, Sine & Evans, 1979; Hale & Strassberg, 1990; Heiman & Rowland, 1983; Lange, Wincze, Zwick, Feldman & Hughes, 1981) with some men exhibiting increased sexual responses when anxious, specifically those with a strong propensity for sexual excitation and a low propensity for sexual inhibition (Bancroft, Janssen, Strong et al., 2003a; Bancroft, Janssen, Strong, & Vukadinovic, 2003b).

Bancroft and colleagues (Bancroft et al., 2003a; Bancroft et al., 2003b) suggest that transference of arousal (more generally known as excitation transference; Zillmann, 1983), arising from anxiety and the concomitant increase in autonomic arousal, could augment sexual response, particularly in those individuals with a strong propensity for sexual excitation and low propensity for sexual inhibition. In our study, participants may have experienced some anxiety while trying to perform the regulation task. If attempted regulation can actually increase emotional response, especially when regulation fails (Wegner et al., 1990), and if perceived poor performance heightens anxiety and general autonomic arousal, increased arousal may explain why some individuals responded more strongly while trying to regulate. In future work, measures of state and trait anxiety may help clarify the possible relationship between anxiety, sexual arousal and sexual arousal regulation.

Based on previous research (McAnulty & Adams, 1991; Nobre, Wiegel, Bach et al., 2004; Rosen & Beck, 1988), we had predicted that there would be good concordance between physiological sexual arousal and both self-reported sexual arousal and perceived degree of erection during erotic-experience trials. We also expected concordance to be good during regulate trials, as emotion regulation appears to modulate the cognitive, affective and physiological changes that accompany an emotional response (Jackson et al., 2000). Results confirmed our predictions: correlations among the PPG and two self-reports within each instruction condition were all strong, while the relationship between the two self-report responses was the strongest ($r > .8$). Additionally, the correlations among the three sexual arousal regulation success indices were all statistically significant.

These results indicate that sexual arousal regulation, when effective, affects cognitive, affective and physiological aspects of sexual response in an equivalent manner.

We hypothesized that age and sexual experiences would be related to sexual arousal regulation success. Theoretically, as men get older and gain more sexual experience, sexual stimuli become less novel and sexual regulation, through practice, improves. The results did not support our prediction; the sexual arousal regulation success indices did not correlate with age or sexual experiences. It seems, therefore, that age and sexual experience are unrelated to regulation success. This may explain why premature ejaculation, a disorder of sexual dyscontrol (American Psychiatric Association, 2000), can be a lifelong problem (e.g., Laumann, Paik, & Rosen, 1999; Rowland, Perelman, Althof et al., 2004).

While sexual excitation was inversely related to self-reported sexual arousal and perceived erectile response regulation success, it was not significantly correlated with physiological arousal regulation success. Similarly, sexual inhibition due to threat of performance consequences was associated with greater physiological arousal regulation success, but was not related to the self-report indices. The correlations for sexual excitation with physiological arousal regulation, and sexual inhibition with the self-report regulation indices, all exhibited a trend towards significance. That they did not reach statistical significance can likely be attributed to the imperfect concordance rates among self-reported arousal, perceived erection and penile response, and the relatively small sample size. The correlations for sexual excitation and inhibition, despite not being uniformly significant across the regulation success indices, still suggest that a strong propensity for sexual response, and a weak propensity for sexual inhibition, make it

difficult for men to regulate their cognitive and physiological sexual arousal in the presence of sexual stimuli. These results offer further support for Bancroft's dual-control model of sexual response (1999a). According to the model, men with weak basal sexual inhibitory tone and strong basal sexual excitatory tone will respond more robustly to sexual stimuli and will have more difficulty controlling that response.

As predicted, dyadic sexual desire inversely correlated with self-reported sexual arousal and perceived penile response regulation. However, it did not correlate with physiological sexual arousal regulation. This may be because the items of the SDI-2, the measure of dyadic sexual desire, capture the motivational and cognitive aspects of sexual desire rather than physiological sexual drive (Levine, 1987, 2003). Examples of SDI-2 items are: 'When you are in romantic situations (such as a candle lit dinner, a walk on the beach, etc.), how strong is your sexual desire?' and 'How important is it for you to fulfill your sexual desire through activity with a partner?'. The measure has little to do with physiological sexual response, unlike the measure of sexual excitation and sexual inhibition, which did correlate with physiological sexual arousal regulation.

Given that sexual compulsivity is characterized by sexual thoughts, fantasies and desires that are intense, recurrent, distressing and that interfere with daily functioning (Coleman, 1991, 2003; Tepper, Owens, Coleman, & Carnes, 2007), it was expected to be strongly associated with sexual arousal regulation. Although the correlations were in the predicted direction, with increased sexual compulsivity associated very weakly with poor sexual arousal regulation, only the relationship between sexual compulsivity and perceived penile response regulation reached statistical significance. Partialling out the effects of sexual desire and sexual excitation substantially decreased the strength of all

three correlation coefficients. It appears, therefore, that sexual compulsivity may be unrelated to sexual arousal regulation in the laboratory. Previously, we reported that sexual compulsivity was indistinguishable from measures of sexual desire (Winters et al., 2007). We argued that sexual compulsivity may simply be a marker of heightened sexual desire and the distress associated with managing a high degree of sexual thoughts, feelings and needs. The current results are consistent with this proposition. Sexual desire and sexual excitation could almost entirely account for the weak relationships between sexual compulsivity and sexual arousal regulation success indices.

There were three important methodological limitations to our study. First, the sample was not representative of the general male population. Men who are willing to participate in sex research, especially that which requires intrusive testing such as penile plethysmography, are probably different than those who are not. Second, participants were relatively young. A sample with a more normal distribution of ages may have produced somewhat different results, despite age seemingly being unrelated to sexual arousal regulation success. Third, the sample was only of moderate size. A larger sample would have increased statistical power, in which case some of the correlations among regulation success indices and other variables of interest may have reached statistical significance.

In terms of PPG sexual preference testing for sexual offenders, our results imply that most offenders, especially those who exhibit heightened sexual drive and sexual self-regulation failure, should not be able to substantially minimize their sexual responses to preferred stimuli. The PPG, in other words, should be resistant to faking of sexual preference when video stimuli and methodology designed to curb cognitive distraction

are used. However, due to ethical and legal restrictions on video and photographic sexual stimuli depicting children, most laboratories present audio stimuli. It may be that emotion reappraisal is more effective when audio stimuli, rather than video, are presented. This hypothesis warrants further investigation.

The next logical step in sexual arousal regulation research is to examine the relationship between regulation performance in the laboratory and sexual arousal regulation in the context of day to day life. Men who have difficulty regulating in the laboratory may also have trouble controlling sexual thoughts, feelings and behaviours outside of the laboratory. This may manifest itself in various ways including sexual behaviours that are risky, compulsive or illegal. If so, treatments and psycho-educational programs that target sexual arousal dysregulation may become increasingly important when addressing sexuality that is considered undercontrolled. This may be especially important for sexual offenders, since dysregulated sexuality appears to play an important role in sexual reoffence (Hanson & Morton-Bourgon, 2004).

3.5 References

- Abel, G. G., Blanchard, E. D., & Barlow, D. H. (1981a). Measurement of sexual arousal in several paraphilias: The effects of stimulus modality, instructional set and stimulus content on the objective. *Behavior Research and Therapy*, 19(1), 25-33.
- Abel, G. G., Blanchard, E. D., Murphy, W. D., Becker, J. V., & Djenderedjian, A. (1981b). Two methods of measuring penile response. *Behavior Research and Therapy*, 12(3), 320-328.
- Adams, H. E., Motsinger, P., McAnulty, R. D., & Moore, A. L. (1992). Voluntary control of penile tumescence among homosexual and heterosexual subjects. *Archives of Sexual Behavior*, 21(1), 17-31.
- American Psychiatric Association. (2000). *The diagnostic and statistical manual of mental disorders (4th ed., text revision)*. Washington, DC: Author.
- Bancroft, J. (1999a). Central inhibition of sexual response in the male: A theoretical perspective. *Neuroscience and Biobehavioral Reviews*, 23(6), 763-784.
- Bancroft, J. (1999b). Sexual science in the 21st century: Where are we going? *Unpublished manuscript*.
- Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003a). The relationship between mood and sexuality in heterosexual men. *Archives of Sexual Behavior*, 32(3), 217-230.
- Bancroft, J., Janssen, E., Strong, D., & Vukadinovic, Z. (2003b). The relation between mood and sexuality in gay men. *Archives of Sexual Behavior*, 32(3), 231-242.

- Bancroft, J., & Vukadinovic, Z. (2004). Sexual addiction, sexual compulsivity, sexual impulsivity, or what? Toward a theoretical model. *Journal of Sex Research, 41*(3), 225-234.
- Barlow, D. H., Sakheim, D. K., & Beck, J. G. (1983). Anxiety increases sexual arousal. *Journal of Abnormal Psychology, 92*(1), 49-54.
- Beauregard, M., Levesque, J., & Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *Journal of Neuroscience, 21*(18), 165RC:161-166.
- Benotsch, E. G., Kalichman, S. C., & Kelly, J. A. (1999). Sexual compulsivity and substance use in HIV seropositive men who have sex with men: Prevalence and predictors of high-risk behaviors. *Addictive Behaviors, 24*(6), 857-868.
- Benotsch, E. G., Kalichman, S. C., & Pinkerton, S. D. (2001). Sexual compulsivity in HIV-positive men and women: Prevalence, predictors, and consequences of high-risk behaviors. *Sexual Addiction and Compulsivity: Journal of Treatment and Prevention, 8*(2), 83-99.
- Bradford, J. M. W. (2001). The neurobiology, neuropharmacology and pharmacological treatment of the paraphilias and compulsive sexual behavior. *Canadian Journal of Psychiatry, 46*(1), 26-34.
- Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In R. Lewis & J. M. Haviland-Jones (Eds.), *The handbook of emotion, 2nd. Edition* (pp. 173-191). New York: Guilford Press.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

- Colby, C. Z., Lanzetta, J. T., & Kleck, R. E. (1977). Effects of expression of pain on autonomic and pain tolerance responses to subject-controlled pain. *Psychophysiology*, 14(6), 537-540.
- Coleman, E. (1991). Compulsive sexual behavior: New concepts and treatment. *Journal of Psychology and Human Sexuality*, 4(2), 37-52.
- Coleman, E. (2003). Compulsive sexual behavior: What to call it, how to treat it? *SIECUS Report*, 31(5), 12-16.
- Derogatis, L. R., & Melisaratos, N. (1979). The DSFI: A multidimensional measure of sexual functioning. *Journal of Sex and Marital Therapy*, 5(3), 244-281.
- Dixon, R., & Turner, R. (2007). Electronic vs. Conventional surveys. In R. A. Reynolds, R. Woods & J. D. Baker (Eds.), *Handbook of research on electronic surveys and measurements* (pp. 105-111). Hershey, PA: Idea Group Inc.
- Dodge, B., Reece, M., Cole, S. L., & Sandford, T. G. M. (2004). Sexual compulsivity among heterosexual college students. *Journal of Sex Research*, 41(4), 343-350.
- Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, 30(4), 510-517.
- Everaerd, W. (1989). Commentary on sex research: Sex as an emotion. *Journal of Psychology and Human Sexuality*, 1(2), 3-15.
- Everaerd, W., Laan, E., Both, S., & Spiering, M. (2001). Sexual motivation and desire. In W. Everaerd, E. Laan & S. Both (Eds.), *Sexual appetite, desire and motivation: Energetics of the sexual system* (pp. 95-110). Amsterdam: Royal Netherlands Academy of the Arts and Sciences.

- Extona, N. G., Truong, T. C., Exton, M. S., Wingenfeld, S. A., Leygraf, N., Saller, B., et al. (2000). Neuroendocrine response to film-induced sexual arousal in men and women. *Psychoneuroendocrinology*, 25(2), 187-199.
- Farkas, G. M., Sine, L. F., & Evans, I. M. (1979). The effects of distraction, performance demand, stimulus explicitness and personality on objective and subjective measures of male sexual arousal. *Behaviour Research and Therapy*, 17(1), 25-32.
- Freund, K. (1963). A laboratory method for diagnosing homo- and hetero-erotic interest in the male. *Behavior Research and Therapy*, 1(1), 85-93.
- Freund, K. (1965). Diagnosing heterosexual pedophilia by means of a test for sexual interest. *Behavior Research and Therapy*, 3(4), 229-234.
- Freund, K. (1967). Diagnosing homo- and heterosexuality and erotic age preference by means of psychophysiological test. *Behavior Research and Therapy*, 5(3), 209-228.
- Frijda, N. H. (1986). *The emotions*. New York: Cambridge University Press.
- Gailliot, M. T., & Baumeister, R. F. (2007). Self-regulation and sexual restraint: Dispositionally and temporarily poor self-regulatory abilities contribute to failures at restraining sexual behavior. *Personality and Social Psychology Bulletin*, 33(2), 173-186.
- Geer, J. H., & Head, S. (1990). The sexual response system. In J. T. Cacioppo & L. G. Tassinary (Eds.), *Principles of psychophysiology: Physical, social, and inferential elements* (pp. 599-630). New York, NY: Cambridge University Press.
- Geer, J. H., Lapour, K. J., & Jackson, S. R. (1993). The information processing approach to human sexuality. In N. Birbaumer & A. Öhman (Eds.), *The structure of*

emotion: Psychophysiological, cognitive and clinical aspects (pp. 139-155).

Toronto: Hogrefe & Huber.

- Golde, J. A., Strassberg, D. S., & Turner, C. M. (2000). Psychophysiological assessment of erectile response and its suppression as a function of stimulus media and previous experience with plethysmography. *Journal of Sex Research*, 37(1), 53-59.
- Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74(1), 224-237.
- Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271-299.
- Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition and Emotion*, 13(5), 551-573.
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, 39(3), 281-291.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, 64(6), 970-986.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*, 106(1), 95-103.
- Hale, V. E., & Strassberg, D. S. (1990). The role of anxiety on sexual arousal. *Archives of Sexual Behavior*, 19(6), 569-581.

- Hanson, R. K., & Morton-Bourgon, K. (2004). *Predictors of sexual recidivism: An updated meta-analysis*. Ottawa, Canada: Public Safety and Emergency Preparedness Canada.
- Haywood, T. W., Grossman, L. S., & Cavanaugh, J. L. (1990). Subjective versus objective measurement of deviant sexual arousal in clinical evaluations of alleged child molester. *Psychological Assessment*, 2(3), 269-275.
- Heiman, J. R., & Rowland, D. L. (1983). Affective and physiological sexual response patterns: The effects of instructions on sexually functional and dysfunctional men. *Journal of Psychosomatic Research*, 27(2), 105-116.
- Henson, D. E., & Rubin, H. B. (1971). Voluntary control of eroticism. *Journal of Applied Behavior Analysis*, 4, 37-44.
- Jackson, D. C., Malmstadt, J. R., Larson, C. L., & Davidson, R. J. (2000). Suppression and enhancement of emotional responses to unpleasant pictures. *Psychophysiology*, 37(4), 515-522.
- Janssen, E., & Everaerd, W. (1993). Determinants of male sexual arousal. *Annual Review of Sex Research*, 4, 211-245.
- Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research*, 37(1), 8-23.
- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002a). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring sexual inhibition and excitation proneness in men. *Journal of Sex Research*, 39(2), 114-126.

- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002b). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: II. Predicting psychophysiological response patterns. *Journal of Sex Research*, 39(2), 127-132.
- Julien, E., & Over, R. (1988). Male sexual arousal across five modes of erotic stimulation. *Archives of Sexual Behavior*, 17(2), 131-143.
- Kafka, M. P. (2003). Sex offending and sexual appetite: The clinical and theoretical relevance of hypersexual desire. *Journal of Offender Therapy and Comparative Criminology*, 47(4), 439-451.
- Kalichman, S. C., & Cain, D. (2004). The relationship between indicators of sexual compulsivity and high risk sexual practices among men and women receiving services from a sexually transmitted infection clinic. *Journal of Sex Research*, 41(3), 235-241.
- Kalichman, S. C., Greenberg, J., & Abel, G. G. (1997a). HIV-seropositive men who engage in high-risk sexual behavior: Psychological characteristics and implications for prevention. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Greenberg, J., & Abel, G. G. (1997b). Sexual compulsivity among HIV positive men who engage in high-risk sexual behavior with multiple partners: An exploratory study. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Johnson, J. R., Adair, V., Rompa, D., Multhau, K., & Kelly, J. A. (1994). Sexual sensation seeking: Scale development and predicting AIDS-risk behavior among homosexually active men. *Journal of Personality Assessment*, 62(3), 385-397.

- Kalichman, S. C., & Rompa, D. (1995). Sexual Sensation Seeking and Sexual Compulsivity Scales: Reliability, validity, and predicting HIV risk behavior. *Journal of Personality Assessment*, 65(3), 586-601.
- Kalichman, S. C., & Rompa, D. (2001). The Sexual Compulsivity Scale: Further development and use with HIV-positive persons. *Journal of Personality Assessment*, 76(3), 379-395.
- Krüger, T., Exton, M. S., Pawlak, C., von zur Mühlen, A., Hartmann, U., & Schedlowski, M. (1998). Neuroendocrine and cardiovascular response to sexual arousal and orgasm in men. *Psychoneuroendocrinology*, 23(4), 401-411.
- Krüger, T. H. C., Schiffer, B., Eikermann, M., Haake, P., Gizewski, E., & Schedlowski, M. (2006). Serial neurochemical measurement of cerebrospinal fluid during the human sexual response cycle. *European Journal of Neuroscience*, 24(12), 3445-3452.
- Kuban, M., Barbaree, H. E., & Blanchard, E. D. (1999). A comparison of volume and circumference phallometry: Response magnitude and method of agreement. *Archives of Sexual Behavior*, 28(4), 345-359.
- Lambie, J. A., & Marcel, A. J. (2002). Consciousness and the varieties of emotion experience: A theoretical framework. *Psychological Review*, 109(2), 219-259.
- Lange, J. D., Wincze, J. P., Zwick, W., Feldman, S., & Hughes, K. (1981). Effects of demand for performance, self-monitoring of arousal, and increased sympathetic nervous system activity on male erectile response. *Archives of Sexual Behavior*, 10(5), 443-464.

- Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunction in the United States: Prevalence and predictors. *Journal of the American Medical Association*, 281(6), 537-544.
- Laws, D. R., & Rubin, H. B. (1969). Instructional control of an autonomic sexual response. *Journal of Applied Behavior Analysis*, 2(2), 93-99.
- Lévesque, J., Eugène, F., Joannette, Y., Paquette, V., Mensour, B., Beaudoin, G., et al. (2003). Neural circuitry underlying voluntary suppression of sadness. *Biological Psychiatry*, 53(6), 502-510.
- Levine, S. B. (1987). More on the nature of sexual desire. *Journal of Sex and Marital Therapy*, 13(1), 35-44.
- Levine, S. B. (2003). The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*, 32(3), 279-285.
- Mahoney, J. M., & Strassberg, D. S. (1991). Voluntary control of male sexual arousal. *Archives of Sexual Behavior*, 20(1), 1-16.
- McAnulty, R. D., & Adams, H. E. (1991). Voluntary control of penile tumescence: Effect of an incentive and a signal detection task. *Journal of Sex Research*, 28(4), 557-577.
- Meston, C. M., & Gorzalka, B. B. (1995). The effects of sympathetic activation on physiological and subjective sexual arousal in women. *Behavior Research and Therapy*, 33(6), 651-664.
- Meston, C. M., & Gorzalka, B. B. (1996). Differential effects of sympathetic activation on sexual arousal in sexually dysfunctional and functional women. *Journal of Abnormal Psychology*, 105(4), 582-591.

- Meston, C. M., & Heiman, J. R. (1998). Ephedrine-activated physiological sexual arousal in women. *Archives of General Psychiatry*, 55(7), 578-579.
- Meyerson, P., & Tryon, W. W. (2003). Validating internet research: A test of psychometric equivalence of internet and in-person samples. *Behavior Research Methods, Instruments and Computers*, 35(4), 614-620.
- Nobre, P. J., Wiegel, M., Bach, A. K., Weisberg, R. B., Brown, T. A., Wincze, J. P., et al. (2004). Determinants of sexual arousal and the accuracy of its self-estimation in sexually functional males. *Journal of Sex Research*, 41(4), 363-371.
- Ochsner, K. N., Bunge, S. A., Gross, J. J., & Gabrieli, J. D. E. (2002). Rethinking feelings: An fMRI study of the cognitive regulation of emotion. *Journal of Cognitive Neurosciences*, 14(8), 1215-1229.
- Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, 9(5), 242-249.
- Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D. E., et al. (2004). For better or for worse: Neural systems supporting the cognitive down- and up-regulation of negative emotions. *Neuroimage*, 23(2), 483-499.
- Palace, E. M., & Gorzalka, B. B. (1990). The enhancing effects of anxiety on arousal in sexually dysfunctional and functional women. *Journal of Abnormal Psychology*, 99(4), 403-411.
- Quinsey, V. L., & Bergersen, S. G. (1976). Instructional control of penile circumference in assessments of sexual preference. *Behavior Therapy*, 7(4), 489-493.

- Quinsey, V. L., & Carrigan, W. F. (1978). Penile responses to visual stimuli: Instructional control with and without auditory sexual fantasy correlates. *Criminal Justice and Behavior*, 5(4), 333-341.
- Roberts, L. D. (2007). Equivalence of electronic and off-line measures. In R. A. Reynolds, R. Woods & J. D. Baker (Eds.), *Handbook of research on electronic surveys and measurements* (pp. 97-103). Hershey, PA: Idea Group Inc.
- Rosen, R. C., & Beck, J. G. (1988). *Patterns of sexual arousal*. New York: Guilford Press.
- Rowland, D., Perelman, M., Althof, S., Barada, J., McCullough, A., Bull, S., et al. (2004). Self-reported premature ejaculation and aspects of sexual functioning and satisfaction. *Journal of Sexual Medicine*, 1(2), 225-232.
- Sakheim, D. K., Barlow, D. H., Beck, J. G., & Abrahamson, D. J. (1985). A comparison of male heterosexual and male homosexual patterns of sexual arousal. *Journal of Sex Research*, 21(2), 183-198.
- Scherer, K. R., Schorr, A., & Johnstone, T. (2001). *Appraisal processes in emotion: Theory, methods and research*. Oxford: Oxford University Press.
- Schroder, K. E. E., Carey, M. P., & Venable, P. A. (2003). Methodological challenges in research on sexual risk behavior: II. Accuracy of self-reports. *Annals of Behavioral Medicine*, 26(2), 104-123.
- Semple, S. J., Zians, J., Grant, I., & Patterson, T. L. (2006). Sexual compulsivity in a sample of HIV-positive methamphetamine-using gay and bisexual men. *AIDS and Behavior*, 10(5), 587-598.

- Spector, I. P., Carey, M. P., & Steinberg, L. (1996). The Sexual Desire Inventory: Development, factor structure, and evidence of reliability. *Journal of Sex and Marital Therapy*, 22(3), 175-190.
- Tepper, M. S., Owens, A. F., Coleman, E., & Carnes, P. (2007). Current controversies in sexual health: Sexual addiction and compulsion. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 349-363). Westport, CT: Praeger/Greenwood.
- Wegner, D. M., Schneider, D. J., Carter, S. I., & White, L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, 53(1), 5-13.
- Wegner, D. M., Shortt, J. W., Blake, A. W., & Page, M. S. (1990). The suppression of exciting thoughts. *Journal of Personality and Social Psychology*, 58(3), 409-418.
- Winters, J., Christoff, K., & Gorzalka, B. B. (2007). *Dysregulated sexuality and heightened sexual desire: Distinct constructs?* Manuscript submitted for publication.
- Wolchik, S. A., Beggs, V. E., Wincze, J. P., Sakheim, D. K., Barlow, D. H., & Mayissakalian, M. (1980). The effect of emotional arousal on subsequent sexual arousal in men. *Journal of Abnormal Psychology*, 89(4), 595-598.
- Zillmann, D. (1983). Transfer of excitation in emotional behavior. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 215-240). New York: Guilford Press.

Chapter 4

General Discussion

4.1 Summary of the Findings

The overall objective of the two studies presented in this thesis was to elucidate the relationships among dysregulated sexuality, sexual arousal regulation and heightened sexual desire. The results reported in chapter two are the first to show that dysregulated sexuality, as it is currently conceptualized, may be indistinguishable from high levels of sexual desire. It also appears to be unrelated to male sexual arousal regulation performance in the laboratory. Sexual arousal regulation failure, on the other hand, seems to be strongly associated with heightened sexual desire and excitation, and with decreased sexual inhibition.

In the first study, four hypotheses were formulated to address the relationships between the current best measure of dysregulated sexuality and two measures of sexual desire. All four hypotheses were supported by the results, indicating that dysregulated sexuality may merely be an indicator of heightened sexual desire. Men and women who had sought treatment for sexual addiction, impulsivity or compulsivity scored significantly higher on the measure of dysregulated sexuality when compared to individuals who had never sought treatment. They also scored higher on measures of sexual excitation and dyadic and solitary sexual desire, and lower on a measure of sexual inhibition. Dysregulated sexuality, sexual excitation, dyadic sexual desire and solitary sexual desire were all significantly intercorrelated within each of the four participant groups. Factor analysis revealed that one underlying latent variable could account for the

scores on and the relationships among dysregulated sexuality and measures of sexual desire. The final stage of analysis showed that the association between dysregulated sexuality and risky sexual behaviour could also be accounted for by the influence of high sexual desire.

Other results from the first study suggest that the distress motivating treatment-seeking behaviour may result from mismanagement of heightened sexual desire, in the context of social constraints on sexuality. Despite being more sexualized and exhibiting stronger sexual desire, treatment seekers' sexual needs appeared to be unmet. This may explain why dysregulated sexuality has been characterized by distressing sexual preoccupation (Coleman, 1991, 2003; Kalichman & Cain, 2004; Kalichman & Rompa, 2001; Tepper, Owens, Coleman, & Carnes, 2007). Additionally, treatment seekers scored lower on a measure of sexual inhibition, suggesting difficulty managing sexual response. As strong appetitive sexual drive accompanies high sexual desire (Everaerd, Laan, Both, & Spiering, 2001; Levine, 2003), distressing preoccupations and rumination might be expected should sexual needs not be fulfilled and sexual response be undercontrolled. Under these circumstances, those who subscribe to restrictive views of sexuality may experience heightened anxiety, guilt or shame, exacerbating the distress already caused by the experience of sexual dyscontrol. From this perspective, many individuals who seek treatment for dysregulated sexuality would not be mentally disordered as defined by the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV-TR; American Psychiatric Association, 2000). The findings described in chapter one, therefore, have significant ramifications for the debate surrounding the validity of

dysregulated sexuality as a distinct form of psychopathology, and its inclusion in the upcoming fifth version of the DSM as some have advocated.

The findings from the first study are also relevant to current perspectives on risky sexual behaviours (RSB). Although there is a small body of research that has linked dysregulated sexuality with RSB, none of those studies controlled for the effects of sexual desire (Benotsch, Kalichman, & Kelly, 1999; Benotsch, Kalichman, & Pinkerton, 2001; Dodge, Reece, Cole, & Sandford, 2004; Kalichman & Cain, 2004; Kalichman, Greenberg, & Abel, 1997a; Kalichman, Greenberg, & Abel, 1997b; Semple, Zians, Grant, & Patterson, 2006). According to the results of the online survey, it is possible that the association between dysregulated sexuality and RSB reported previously may be accounted for by the effects of high sexual desire. Given that high sexual desire is characterized by greater sexual drive and increased motivation to pursue sexual activity (Levine, 2003), theoretically individuals with higher sexual desire would be more likely to pursue sexual activity despite potential risk. Findings reported by Bancroft and colleagues provide support for this assertion (Bancroft, Janssen, Carnes, Goodrich, & Long, 2004; Bancroft, Janssen, Strong et al., 2003b). In samples of gay and heterosexual men, an increased propensity for sexual excitation was related to high-risk sexual behaviours. The findings outlined in chapter two, along with those described by Bancroft and colleagues, have implications for psycho-educational intervention programs aimed at reducing risky sexual behaviours. Additionally, they suggest future research on risky sexual behaviour may benefit by shifting focus from dysregulated sexuality to mismanaged heightened sexual desire.

The primary goal of the second study was to examine the relationships between male sexual arousal regulation, and dysregulated sexuality and sexual desire. Although all three markers of sexual arousal regulation failure employed were associated with increased sexual desire and decreased sexual inhibition, only one correlated with dysregulated sexuality. Further, what very weak relationships there were between dysregulated sexuality and the markers of sexual arousal regulation failure could be almost entirely accounted for by the effects of high sexual desire. This implies that dysregulated sexuality is unrelated to sexual arousal regulation in the male non-clinical population. These findings stand in contrast to current conceptualizations of dysregulated sexuality, which include sexual disinhibition and undercontrolled sexual response as core features (Coleman, 1991, 2003; Kalichman & Cain, 2004; Kalichman & Rompa, 2001; Tepper et al., 2007).

There were two other important findings of note from the laboratory study. First, sexual arousal regulation was strongly associated with amusement regulation, suggesting that one's ability to regulate emotion crosses emotional domains. Second, some men became more sexually aroused when they attempted to regulate their sexual arousal. This was attributed to the enhancing effect anxiety may have on sexual arousal via increased activation of the sympathetic nervous system (Bancroft, Janssen, Strong et al., 2003a; Bancroft, Janssen, Strong, & Vukadinovic, 2003c). Both findings have implications for current clinical perspectives on dysregulated sexuality and future research in the area, as described in the next section.

There were several methodological limitations to the studies described in this dissertation. The samples were not representative and therefore findings cannot be

generalized. Sex research requires people to divulge private information; given the sensitive nature of the topic, self-selection likely has a substantial impact on sampling. Further, the large majority of the participants recruited for the online survey study responded to internet and print notices that appeared in sex advice columns. These individuals may be younger, and more likely urban and sexually liberal, compared to the general population. This is presumably also true of the men who participated in the laboratory study, especially considering the very invasive nature of penile plethysmography testing. Finally, the sample did not include any men who had sought treatment for sexual addiction, impulsivity or compulsivity. The addition of treatment seeking participants would have allowed for interesting group comparisons, such as those made in the online survey study.

4.2 Implications and Future Directions

4.2.1 Dysregulated Sexuality as a Behavioural Disorder

Regardless of the ongoing debate over how dysregulated sexuality should be conceptualized and labelled, many clinicians and researchers agree that dysregulated sexuality represents a distinct form of psychiatric illness (Allen & Hollander, 2006; Anthony & Hollander, 1993; Barth & Kinder, 1987; Black, 1998; Bradford, 2001; P. Carnes & Adams, 2002; P. J. Carnes, 1983; Coleman, 1986, 1990, 1991, 1992; Goodman, 1992, 1993, 1997; Kafka, 2000a; Kafka & Hennen, 1999; Kafka & Prentky, 1992; Leedes, 2007; Raymond, Coleman, & Miner, 2003; Rinehart & McCabe, 1997; Tepper et al., 2007; Travin, 1995). Some of them have proposed that dysregulated sexuality should be recognized as mental disorder within the diagnostic framework of the DSM (American

Psychiatric Association, 2000). A small minority has argued that it is better to avoid categorical psychiatric diagnoses all together (Bancroft & Vukadinovic, 2004; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman & Rompa, 2001). As Bancroft and Vukadinovic (2004) noted, dysregulated sexuality has not been qualitatively distinguished from patterns of sexual behaviour that are situated at the extreme end of the spectrum. Nor has it been sufficiently differentiated from high sexual desire (Dodge et al., 2004).

The findings described in chapter two directly contribute to the discussion about the nature of dysregulated sexuality. Dysregulated sexuality was indistinguishable from high sexual desire in groups of men and women who had sought treatment for sexual addiction, impulsivity or compulsivity, and in those who had not. In the former group, the unsuccessful control of sexual thoughts, feelings and behaviours within the context of perceived social disapproval and unmet sexual needs, may have resulted in distress significant enough to motivate treatment seeking behaviour. However, it is unclear if the heightened sexual desire exhibited by treatment seekers is qualitatively different from that experienced by someone situated at the very high end of the sexual desire spectrum who is not distressed. Until it can be established that people seeking treatment for sexual addiction, impulsivity or compulsivity exhibit some fundamental difference in sexual dysregulation that can account for the distress they experience, characterizing dysregulated sexuality as a psychiatric illness may be premature. In fact, dysregulated sexuality may be best characterized simply as a negative psychological state (Wakefield, Pottick, & Kirk, 2002).

4.2.2 Relevance of Sexual Arousal Regulation in the Laboratory to Sexual Behaviour

The findings from the laboratory study illustrate that sexual arousal regulation ability in men varies widely, and that sexual arousal regulation failure is associated with increased sexual desire and excitation, and decreased sexual inhibition. While these findings on their own are of theoretical interest, they are more meaningful in the context of day to day life. As such, the next step in this line of research is to evaluate the relationship between sexual arousal regulation and sexual behaviour outside the laboratory.

The results described in chapter three show that the men least able to regulate their sexual arousal were those with the highest sexual desire. Sexual desire, according to Levine (Levine, 1987, 2003), is what motivates people to pursue sexual behaviour, and a key component of high sexual desire is increased sexual drive. Those individuals with strong sexual desire are presumably more attuned to sexual stimuli than individuals with low or moderate desire and are therefore likely to exhibit increased sexual arousability (Whalen, 1966). If they also are unable to regulate that arousal, they would probably exhibit higher rates of partnered and/or solitary sexual behaviour as a means of achieving sexual relief. Should this hypothesis be true, it has explanatory implications for problematic sexual behaviour. For example, it may be that sexual arousal regulation failure plays a substantial role in the relationship between sexual desire and risky sexual behaviours.

4.2.3 Sexual Arousal Regulation in Other Populations

The scope of the two studies described in this thesis was constrained by available resources. The sample recruited for the second study, in particular, was limited in size and consisted only of non-treatment seeking men. Nevertheless, the findings provide a foundation from which to explore sexual arousal regulation in other populations including women, people seeking treatment for sexual addiction, impulsivity or compulsivity, and sexual offenders.

Hypothetically, women, like men, should be able to regulate sexual arousal using emotion reappraisal. Presumably, sexual desire and sexual arousal regulation success would also be inversely related. As there are significant sex differences in sexual arousability and response (e.g., Baumeister, Catanese, & Vohs, 2001; Chivers, 2005; Chivers, Rieger, Latty, & Bailey, 2004; Regan & Atkins, 2006), however, it is plausible that men and women may differ in their regulation abilities. Given that male sexual desire appears to be stronger than female sexual desire (Baumeister et al., 2001; Regan & Atkins, 2006), and according to the results of the laboratory study, sexual desire is inversely related to sexual arousal regulation success, women are likely better at regulating their sexual arousal. This may explain why problems of sexual dyscontrol seem to affect more men than women.

Sexual arousal regulation failure, and its relationship to heightened sexual desire, may be important in the clinical presentation of dysregulated sexuality. Earlier in this chapter, it was posited that the distress experienced by individuals seeking treatment for dysregulated sexuality is a consequence of mismanaged high sexual desire. Sexual arousal regulation failure, in combination with increased sexual arousability, may be a

crucial element in persistent and distressing feelings of sexual dyscontrol experienced by individuals who seek treatment for sexual addiction, impulsivity or compulsivity. A study similar to that described in chapter three, but utilizing a sample of treatment seeking men and women, could address this hypothesis.

Another population of interest is sexual offenders, as sexual arousal regulation failure may play a significant role in sexual offending. In their meta-analysis of sexual offender recidivism, Hanson and Morton-Bourgon (2004) found that sexual preoccupation was among the top predictors of sexual reoffence. Additionally, Kafka (2003) reported that sexual offenders, in particular those diagnosed with paraphilias, were more likely to exhibit dysregulated sexuality. It may be that sexual arousal regulation failure may help explain, in part, why some men are motivated to pursue non-consensual sexual behaviour despite moral and legal prohibitions.

Should sexual arousal regulation failure prove to be characteristic of sexual offenders and individuals seeking treatment for dysregulated sexuality, a critical next step would be to test the efficacy of sexual arousal regulation training in reducing problematic sexuality. As proposed previously, sexual arousal regulation failure may be an important causal factor in sexuality that is in some way harmful. Individuals who exhibit problematic sexuality and are initially unable to regulate their sexual arousal may be able to improve sexual arousal regulation through instruction and practice. That improvement may translate into an overall reduction in sexual dyscontrol, and ultimately problematic sexual behaviour.

4.2.4. The Role of Anxiety in Dysregulated Sexuality

Contrary to expectations, some male participants in the laboratory study exhibited increased sexual arousal while trying to regulate their sexual arousal. This was attributed to the amplifying effect anxiety may have on sexual arousal, via sympathetic activation. Although evidence from well controlled laboratory studies indicates anxiety and sympathetic activation increase sexual arousal in women (Meston & Gorzalka, 1995, 1996; Meston & Heiman, 1998; Palace & Gorzalka, 1990), similar studies of men have produced mixed results (Barlow, Sakheim & Beck, 1983; Farkas, Sine & Evans, 1979; Heiman & Rowland, 1983; Lange, Wincze, Zwick, Feldman & Hughes, 1981). Bancroft and colleagues (Bancroft et al., 2003a; Bancroft et al., 2003b; Bancroft et al., 2003c) reported that some men, in particular those with a strong propensity for sexual excitation and a low propensity for sexual inhibition, seem to experience increased sexual response when anxious, while others exhibit the opposite pattern. To date, no well controlled laboratory studies of men have attempted to differentiate these two groups of men on sexual responding while anxious.

Anxiety may play an important arousal enhancing role in the pattern of dysregulated sexual thoughts, feelings and behaviours experienced by individuals who seek treatment for dysregulated sexuality. Assuming that anxiety may increase sexual arousal in women and some men, anxiety experienced by individuals having trouble managing high sexual desire may both exacerbate dysregulated sexuality symptoms and increase the distress associated with the same. Although previous studies have shown increased incidence of anxiety in samples of individuals seeking treatment for sexual addiction, impulsivity or compulsivity (Bancroft & Vukadinovic, 2004; Black, Kehrberg,

Flumerfelt, & Schlosser, 1997; Kafka & Prentky, 1992; Raymond et al., 2003), none have explained why. The potential role of anxiety in the clinical presentation of dysregulated sexuality may partially explain why mood elevating drugs, specifically the selective serotonin reuptake inhibitors, are effective in reducing symptoms (Bradford, 2001; Kafka, 2000b; Stein, Hollander, Anthony, Schneier, & Fallon, 1992). The precise role that anxiety plays in clinical presentation of dysregulated sexuality is an issue that should be addressed in future research.

4.3 Conclusion

The work presented in this dissertation represents a step forward in understanding both dysregulated sexuality and sexual arousal regulation. For dysregulated sexuality to be recognized as a distinct psychopathological entity, as some have proposed, it must be sufficiently differentiated from mismanaged heightened sexual desire. The findings presented in chapter two suggest this may not be possible, as dysregulated sexuality and heightened sexual desire were indistinguishable. Similarly, the distress experienced by people seeking treatment for dysregulated sexuality may not necessarily indicate mental illness, but rather a negative psychological state brought upon by mismanaged sexual desire. It is possible that a change in management of sexual desire and behaviour, and/or reframing sexuality in a less restrictive way, may result in significant clinical improvement.

The study outlined in chapter three has the potential to open a new avenue of research. Sexual arousal regulation, and its relationship with general emotion regulation and sexual desire, may play an important role in the control of sexual thoughts, feelings

and behaviours. For example, a deficit in sexual arousal regulation may prove to be associated with problematic sexual behaviours. If this proves true, a therapeutic focus on improving sexual arousal regulation in individuals exhibiting problematic sexual behaviour may be beneficial.

4.4 References

- Allen, A., & Hollander, E. (2006). Sexual compulsions. In E. Hollander & D. J. Stein (Eds.), *Clinical manual of impulse control disorders* (pp. 87-114). Washington, DC: American Psychiatric Publishing.
- American Psychiatric Association. (2000). *The diagnostic and statistical manual of mental disorders (4th ed., text revision)*. Washington, DC: Author.
- Anthony, D. T., & Hollander, E. (1993). Sexual compulsions. In E. Hollander (Ed.), *Obsessive compulsive-related disorders* (pp. 139-150). Washington: American Psychiatric Press, Inc.
- Bancroft, J., Janssen, E., Carnes, L., Goodrich, D., & Long, J. S. (2004). Sexual activity and risk taking in young heterosexual men: The relevance of sexual arousability, mood, and sensation seeking. *Journal of Sex Research*, 41(2), 181-192.
- Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003a). The relationship between mood and sexuality in heterosexual men. *Archives of Sexual Behavior*, 32(3), 217-230.
- Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003b). Sexual risk-taking in gay men: The relevance of sexual arousability, mood, and sensation seeking. *Archives of Sexual Behavior*, 32(6), 555-572.
- Bancroft, J., Janssen, E., Strong, D., & Vukadinovic, Z. (2003c). The relation between mood and sexuality in gay men. *Archives of Sexual Behavior*, 32(3), 231-242.
- Bancroft, J., & Vukadinovic, Z. (2004). Sexual addiction, sexual compulsivity, sexual impulsivity, or what? Toward a theoretical model. *Journal of Sex Research*, 41(3), 225-234.

- Barlow, D. H., Sakheim, D. K., & Beck, J. G. (1983). Anxiety increases sexual arousal. *Journal of Abnormal Psychology, 92*(1), 49-54.
- Barth, R. J., & Kinder, B. N. (1987). The mislabelling of sexual impulsivity. *Journal Of Sex and Marital Therapy, 13*(1), 15-23.
- Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and Social Psychology Review, 5*(3), 242-273.
- Benotsch, E. G., Kalichman, S. C., & Kelly, J. A. (1999). Sexual compulsivity and substance use in HIV seropositive men who have sex with men: Prevalence and predictors of high-risk behaviors. *Addictive Behaviors, 24*(6), 857-868.
- Benotsch, E. G., Kalichman, S. C., & Pinkerton, S. D. (2001). Sexual compulsivity in HIV-positive men and women: Prevalence, predictors, and consequences of high-risk behaviors. *Sexual Addiction and Compulsivity: Journal of Treatment and Prevention, 8*(2), 83-99.
- Black, D. W. (1998). Compulsive sexual behavior: A review. *Journal of Practical Psychiatry and Behavioral Health, 4*(2), 219-229.
- Black, D. W., Kehrberg, L. L. D., Flumerfelt, D. L., & Schlosser, S. S. (1997). Characteristics of 36 subjects reporting compulsive sexual behavior. *American Journal of Psychiatry, 154*(2), 243-249.
- Bradford, J. M. W. (2001). The neurobiology, neuropharmacology and pharmacological treatment of the paraphilias and compulsive sexual behavior. *Canadian Journal of Psychiatry, 46*(1), 26-34.

- Carnes, P. J., & Adams, K. M. (Eds.). (2002). *Clinical management of sex addiction*. New York: Brunner/Routledge.
- Carnes, P. J. (1983). *Out of the shadows: Understanding sexual addiction*. Minneapolis, MN: CompCare.
- Chivers, M. L. (2005). A brief review and discussion of sex differences in the specificity of sexual arousal. *Sexual and Relationship Therapy*, 20(4), 377-390.
- Chivers, M. L., Rieger, G., Latty, E., & Bailey, J. M. (2004). A sex difference in the specificity of sexual arousal. *Psychological Science*, 15(11), 736-744.
- Coleman, E. (1986). Sexual compulsion vs. Sexual addiction: The debate continues. *SIECUS Report* 14(6), 7-11.
- Coleman, E. (1990). The obsessive-compulsive model for describing compulsive sexual behavior. *American Journal of Preventive Psychiatry & Neurology*, 2(3), 9-14.
- Coleman, E. (1991). Compulsive sexual behavior: New concepts and treatment. *Journal of Psychology and Human Sexuality*, 4(2), 37-52.
- Coleman, E. (1992). Is your patient suffering from compulsive sexual behaviors? *Psychiatric Annals*, 22(6), 320-325.
- Coleman, E. (2003). Compulsive sexual behavior: What to call it, how to treat it? *SIECUS Report*, 31(5), 12-16.
- Dodge, B., Reece, M., Cole, S. L., & Sandford, T. G. M. (2004). Sexual compulsivity among heterosexual college students. *Journal of Sex Research*, 41(4), 343-350.
- Everaerd, W., Laan, E., Both, S., & Spiering, M. (2001). Sexual motivation and desire. In W. Everaerd, E. Laan & S. Both (Eds.), *Sexual appetite, desire and motivation*:

- Energetics of the sexual system* (pp. 95-110). Amsterdam: Royal Netherlands Academy of the Arts and Sciences.
- Farkas, G. M., Sine, L. F., & Evans, I. M. (1979). The effects of distraction, performance demand, stimulus explicitness and personality on objective and subjective measures of male sexual arousal. *Behaviour Research and Therapy*, 17(1), 25-32.
- Goodman, A. (1992). Sexual addiction: Designation and treatment. *Journal of Sex and Marital Therapy*, 18(4), 303-314.
- Goodman, A. (1993). Diagnosis and treatment of sexual addiction. *Journal of Sex and Marital Therapy*, 19(3), 225-242.
- Goodman, A. (1997). Sexual addiction: Diagnosis, etiology and treatment. In J. H. Lowenstein, R. B. Millman, P. Ruiz & J. G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 340-354). Baltimore: Williams & Wilkins.
- Hanson, R. K., & Morton-Bourgon, K. (2004). *Predictors of sexual recidivism: An updated meta-analysis*. Ottawa, Canada: Public Safety and Emergency Preparedness Canada.
- Heiman, J. R., & Rowland, D. L. (1983). Affective and physiological sexual response patterns: The effects of instructions on sexually functional and dysfunctional men. *Journal of Psychosomatic Research*, 27(2), 105-116.
- Kafka, M. P. (2000a). The paraphilia-related disorders: Nonparaphilic hypersexuality and sexual compulsivity/addiction. In S. R. Lieblum & R. C. Rosen (Eds.), *Principles and practice of sex therapy* (3rd ed., Vol., pp. 471-503). New York: Guilford.
- Kafka, M. P. (2000b). Psychopharmacologic treatments for nonparaphilic compulsive sexual behaviors. *CNS Spectrums*, 5, 49-59.

- Kafka, M. P. (2003). Sex offending and sexual appetite: The clinical and theoretical relevance of hypersexual desire. *Journal of Offender Therapy and Comparative Criminology*, 47(4), 439-451.
- Kafka, M. P., & Hennen, J. (1999). The paraphilia-related disorders: An empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. *Journal of Sex and Marital Therapy*, 25(4), 305-319.
- Kafka, M. P., & Prentky, R. (1992). A comparative study of nonparaphilic sexual addictions and paraphilias in men. *Journal of Clinical Psychiatry*, 53(10), 345-350.
- Kalichman, S. C., & Cain, D. (2004). The relationship between indicators of sexual compulsivity and high risk sexual practices among men and women receiving services from a sexually transmitted infection clinic. *Journal of Sex Research*, 41(3), 235-241.
- Kalichman, S. C., Greenberg, J., & Abel, G. G. (1997a). HIV-seropositive men who engage in high-risk sexual behavior: Psychological characteristics and implications for prevention. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., Greenberg, J., & Abel, G. G. (1997b). Sexual compulsivity among HIV positive men who engage in high-risk sexual behavior with multiple partners: An exploratory study. *AIDS Care*, 9(4), 441-450.
- Kalichman, S. C., & Rompa, D. (2001). The Sexual Compulsivity Scale: Further development and use with HIV-positive persons. *Journal of Personality Assessment*, 76(3), 379-395.

- Lange, J. D., Wincze, J. P., Zwick, W., Feldman, S., & Hughes, K. (1981). Effects of demand for performance, self-monitoring of arousal, and increased sympathetic nervous system activity on male erectile response. *Archives of Sexual Behavior*, 10(5), 443-464.
- Leedes, R. (2007). Compulsive or other problematic sexual behavior. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 365-381). Westport, CT: Praeger.
- Levine, S. B. (1987). More on the nature of sexual desire. *Journal of Sex and Marital Therapy*, 13(1), 35-44.
- Levine, S. B. (2003). The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*, 32(3), 279-285.
- Meston, C. M., & Gorzalka, B. B. (1995). The effects of sympathetic activation on physiological and subjective sexual arousal in women. *Behavior Research and Therapy*, 33(6), 651-664.
- Meston, C. M., & Gorzalka, B. B. (1996). Differential effects of sympathetic activation on sexual arousal in sexually dysfunctional and functional women. *Journal of Abnormal Psychology*, 105(4), 582-591.
- Meston, C. M., & Heiman, J. R. (1998). Ephedrine-activated physiological sexual arousal in women. *Archives of General Psychiatry*, 55(7), 578-579.
- Palace, E. M., & Gorzalka, B. B. (1990). The enhancing effects of anxiety on arousal in sexually dysfunctional and functional women. *Journal of Abnormal Psychology*, 99(4), 403-411.

- Raymond, N. C., Coleman, E., & Miner, M. H. (2003). Psychiatric comorbidity and compulsive/impulsive traits in compulsive sexual behavior. *Comprehensive Psychiatry*, 44(5), 370-380.
- Regan, P. C., & Atkins, L. (2006). Sex differences and similarities in frequency and intensity of sexual desire. *Social Behavior and Personality*, 34(1), 95-102.
- Rinehart, N. L., & McCabe, M. P. (1997). Hypersexuality: Psychopathology or normal variant of sexuality? *Sexual and Marital Therapy*, 12(1), 45-60.
- Semple, S. J., Zians, J., Grant, I., & Patterson, T. L. (2006). Sexual compulsivity in a sample of HIV-positive methamphetamine-using gay and bisexual men. *AIDS and Behavior*, 10(5), 587-598.
- Stein, D. J., Hollander, E., Anthony, D. T., Schneier, F. R., & Fallon, B. A. (1992). Serotonergic medications for sexual obsessions, sexual addictions, and paraphilias. *Journal of Clinical Psychiatry*, 53(8), 267-211.
- Tepper, M. S., Owens, A. F., Coleman, E., & Carnes, P. (2007). Current controversies in sexual health: Sexual addiction and compulsion. In A. F. Owens & M. S. Tepper (Eds.), *Sexual health: State-of-the-art treatments and research* (Vol. 4, pp. 349-363). Westport, CT: Praeger/Greenwood.
- Travin, S. (1995). Compulsive sexual behaviors. *The Psychiatric Clinics of North America*, 18(1), 155-169.
- Wakefield, J. C., Pottick, K. J., & Kirk, S. A. (2002). Should the DSM-IV diagnostic criteria for conduct disorder consider social context? *American Journal of Psychiatry*, 159(3), 380-386.
- Whalen, R. E. (1966). Sexual motivation. *Psychological Review*, 73(2), 151-163.

Appendix I: Demographics and General Information Form (DGIF)**Instructions:**

In this questionnaire, you will find some questions about your background. Please do not skip any question. Try to be as honest as possible.

1. How old are you? _____ years old.
2. How do you identify yourself?
 - ☐ Male
 - ☐ Female
 - ☐ Other (please specify) _____
3. Is English your native language?
 - ☐ Yes
 - ☐ No
4. With which ethnicity do you identify yourself?
 - ☐ European/Caucasian
 - ☐ Aboriginal/First Nations
 - ☐ Asian
 - ☐ East Indian
 - ☐ African
 - ☐ Middle Eastern
 - ☐ Latin American
 - ☐ Other (please specify) _____
5. Would you describe the type of person you find most sexually attractive as:
 - ☐ Only female (or female identified)
 - ☐ Only male (or male identified)
 - ☐ Mainly female but sometimes male
 - ☐ Could be equally male or female
 - ☐ Mainly male but sometimes female
6. Have you experienced any type of sexual activity with a female partner?
 - ☐ Yes
 - ☐ No
7. Have you experienced any type of sexual activity with a male partner?
 - ☐ Yes
 - ☐ No

8. Which of these commonly used terms would you use to describe yourself?
- ☐ Heterosexual/Straight
 - ☐ Bisexual
 - ☐ Homosexual (Gay/Lesbian)
 - ☐ Queer
 - ☐ Transgendered
 - ☐ Intersexed
 - ☐ Other (please specify) _____
9. Is your current partner(s) male or female?
- ☐ Female (or female identified)
 - ☐ Male (or male identified)
 - ☐ Partners of both sexes
 - ☐ Not in a sexual relationship
10. Are you currently:
- ☐ In an exclusive/monogamous sexual relationship (that is, you have sex exclusively with one partner)
 - ☐ In non-exclusive/non-monogamous sexual relationships (that is, you have sex with more than one partner)
 - ☐ Not in a sexual relationship
11. If you are currently in a relationship, for how long have you been in this relationship?
(If you are not currently in a relationship, please put 0 years and 0 months.)
_____ years and _____ months
12. What is your marital status?
- ☐ Single/never married
 - ☐ Cohabiting (living together)
 - ☐ Married
 - ☐ Separated/Divorced
 - ☐ Widowed
13. Where do you live (city, province/state and country - e.g. Vancouver BC Canada)?

14. Where were you born (city, province/state and country - e.g. Vancouver BC Canada)?

15. Have you ever sought treatment for compulsive, impulsive or addictive sexual behaviour, or attended Sexual Addicts Anonymous?
- ☐ Yes
 - ☐ No

16. Are you currently an undergraduate student?

- ☐ Yes
- ☐ No

17. In terms of socioeconomic status, how would you describe yourself and/or your family?

- ☐ Extremely Low
- ☐ Low
- ☐ Moderate
- ☐ High
- ☐ Extremely High

18. Do you consider yourself a spiritual person?

- ☐ Yes
- ☐ No

19. Are you a member of an organized religion?

- ☐ Yes
- ☐ No

20. If yes, what is your religion (if you aren't religious, put 'None')?

21. How important is religion in your life?

- ☐ Not at all important
- ☐ Slightly important
- ☐ Somewhat important
- ☐ Quite important
- ☐ Extremely important

22. What is the highest level of education that you have completed?

- ☐ Middle school
- ☐ High school
- ☐ Undergraduate degree
- ☐ Post secondary diploma
- ☐ Professional degree
- ☐ Masters Degree
- ☐ PhD

Appendix II: Sexual Compulsivity Scale (SCS)

Instructions:

A number of statements that some people have used to describe themselves are given below. Read each statement and then click the response to show how well you believe the statement describes you.

	Not at all like me	Slightly like me	Mainly like me	Very much like me
1. My sexual appetite has gotten in the way of my relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My sexual thoughts and behaviours are causing problems in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My desires to have sex have disrupted my daily life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I sometime fail to meet my commitments and responsibilities because of my sexual behaviour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I sometimes get so horny I could lose control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I find myself thinking of sex while at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I feel that sexual thoughts and feelings are stronger than I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I have to struggle to control my sexual thoughts and behaviour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I think about sex more than I would like to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. It has been difficult for me to find sex partners who desire having sex as much as I want to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix III: Sexual Excitation/Sexual Inhibition Scales (SES/SIS) - Female

Instructions:

In this questionnaire you will find statements about how you might react to various sexual situations, activities, or behaviors. Obviously, how you react will often depend on the circumstances, but we are interested in what would be the most likely reaction for you.

Please read each statement carefully and decide how you would be most likely to react. Then choose the response that corresponds with your answer.

Please try to respond to every statement.

Sometimes you may feel that none of the responses seems completely accurate. Sometimes you may read a statement which you feel is 'not applicable'. In these cases, please choose a response which you would choose if it were applicable to you. If you absolutely can't choose a response, please click 'Not Applicable'.

In many statements you will find words describing reactions such as 'sexually aroused', or sometimes just 'aroused'. With these words we mean to describe 'feelings of sexual excitement', feeling 'sexually stimulated', 'horny', 'hot', or 'turned on'.

Don't think too long before answering, please give your first reaction.

Try to not skip any questions. Try to be as honest as possible.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
1. When I look at erotic pictures, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I feel that I am being rushed, I am unlikely to get very aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If I am on my own watching a sexual scene in a film I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Sometimes I become sexually aroused just by lying in the sun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Using condoms or other safe-sex products can cause me to lose my arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When a sexually attractive stranger accidentally touches me, I easily become aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When I have a quiet candlelight dinner with someone I find sexually attractive, I get aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. If there is a risk of unwanted pregnancy, I am unlikely to get sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I need my clitoris to be stimulated to continue feeling aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. When I am having sex, I have to focus on my own sexual feelings in order to stay aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. When I feel sexually aroused, I usually have a genital response (e.g., vaginal lubrication, being wet).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. If I am having sex in a secluded, outdoor place and I think that someone is nearby, I am not likely to get very aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. When I see someone I find attractive dressed in a sexy way, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. When I think someone sexually attractive wants to have sex with me, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. If I discovered that someone I find sexually attractive is too young, I would have difficulty getting sexually aroused with him/her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. When I talk to someone on the telephone who has sexy voice, I become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. When I notice that my partner is sexually aroused, my own arousal becomes stronger.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. If my new sexual partner does not want to use a condom/safe-sex product, I am unlikely to stay aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I cannot get aroused unless I focus exclusively on sexual stimulation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. If I feel that I'm expected to respond sexually, I have difficulty getting aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. If I am concerned about pleasing my partner sexually, it interferes with my arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. If I am masturbating on my own and I realize that someone is likely to come into the room at any moment, I will lose my sexual arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. It is difficult to become sexually aroused unless I fantasize about a very arousing situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. If I can be heard by others while having sex, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Just thinking about a sexual encounter I have had is enough to turn me on sexually.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. When taking a shower or bath, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. If I realize there is a risk of catching a sexually transmitted disease, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. If I can be seen by others while having sex, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. If I am with a group of people watching an X-rated film, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. When a sexually attractive stranger looks me straight in the eye, I become aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. If I think that having sex will cause me pain, I will lose my arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. When I wear something I feel attractive in, I am likely to become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. If I am worried about being too dry, I am less likely to get lubricated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. If having sex will cause my partner pain, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. When I think of a very attractive person, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Once I am sexually aroused, I want to start intercourse right away before I lose my arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. When I start fantasizing about sex, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. When I see others engaged in sexual activities, I feel like having sex myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. When I see an attractive person, I start fantasizing about having sex with him/her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. When I have a distracting thought, I easily lose my arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. I often rely on fantasies to help me maintain my sexual arousal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. If I am distracted by hearing music, television, or a conversation, I am unlikely to stay aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. When I feel interested in sex, I usually have a genital response (e.g., vaginal lubrication, being wet).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. When an attractive person flirts with me, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. During sex, pleasing my partner sexually makes me more aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix IV: Sexual Excitation/Sexual Inhibition Scales (SES/SIS) - Male

Instructions:

In this questionnaire you will find statements about how you might react to various sexual situations, activities, or behaviors. Obviously, how you react will often depend on the circumstances, but we are interested in what would be the most likely reaction for you.

Please read each statement carefully and decide how you would be most likely to react. Then choose the response that corresponds with your answer.

Please try to respond to every statement.

Sometimes you may feel that none of the responses seems completely accurate. Sometimes you may read a statement which you feel is 'not applicable'. In these cases, please choose a response which you would choose if it were applicable to you. If you absolutely can't choose a response, please click 'Not Applicable'.

In many statements you will find words describing reactions such as 'sexually aroused', or sometimes just 'aroused'. With these words we mean to describe 'feelings of sexual excitement', feeling 'sexually stimulated', 'horny', 'hot', or 'turned on'.

Don't think too long before answering, please give your first reaction.

Try to not skip any questions. Try to be as honest as possible.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
1. When I look at erotic pictures, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I feel that I am being rushed, I am unlikely to get very aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If I am on my own watching a sexual scene in a film I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Sometimes I become sexually aroused just by lying in the sun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Putting on a condom can cause me to lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When a sexually attractive stranger accidentally touches me, I easily become aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When I have a quiet candlelight dinner with someone I find sexually attractive, I get aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. If there is a risk of unwanted pregnancy, I am unlikely to get sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I need my penis to be touched to maintain an erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. When I am having sex, I have to focus on my own sexual feelings in order to keep my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. When I feel sexually aroused, I usually have an erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. If I am having sex in a secluded, outdoor place and I think that someone is nearby, I am not likely to get very aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. When I see someone I find attractive dressed in a sexy way, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. When I think someone sexually attractive wants to have sex with me, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. If I discovered that someone I find sexually attractive is too young, I would have difficulty getting sexually aroused with him/her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. When I talk to someone on the telephone who has sexy voice, I become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. When I notice that my partner is sexually aroused, my own arousal becomes stronger.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. If my new sexual partner does not want to use a condom, I am unlikely to stay aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I cannot get aroused unless I focus exclusively on sexual stimulation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. If I feel that I'm expected to respond sexually, I have difficulty getting aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. If I am concerned about pleasing my partner sexually, I easily lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. If I am masturbating on my own and I realize that someone is likely to come into the room at any moment, I will lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. It is difficult to become sexually aroused unless I fantasize about a very arousing situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. If I can be heard by others while having sex, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Just thinking about a sexual encounter I have had is enough to turn me on sexually.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. When taking a shower or bath, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. If I realize there is a risk of catching a sexually transmitted disease, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. If I can be seen by others while having sex, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. If I am with a group of people watching an X-rated film, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. When a sexually attractive stranger looks me straight in the eye, I become aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. If I think that having sex will cause me pain, I will lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. When I wear something I feel attractive in, I am likely to become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. If I think that I might not get an erection, then I am less likely to get one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. If having sex will cause my partner pain, I am unlikely to stay sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. When I think of a very attractive person, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Once I have an erection, I want to start intercourse right away before I lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. When I start fantasizing about sex, I quickly become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. When I see others engaged in sexual activities, I feel like having sex myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. When I see an attractive person, I start fantasizing about having sex with him/her.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. When I have a distracting thought, I easily lose my erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. I often rely on fantasies to help me maintain an erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. If I am distracted by hearing music, television, or a conversation, I am unlikely to stay aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. When I feel interested in sex, I usually get an erection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. When an attractive person flirts with me, I easily become sexually aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. During sex, pleasing my partner sexually makes me more aroused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix V: Sexual Desire Inventory-2 (SDI-2)

Instructions:

This questionnaire asks about your level of sexual desire. By desire, we mean INTEREST IN or WISH FOR SEXUAL ACTIVITY. For each item, please click the response that best shows your thoughts and feelings.

Please do not skip any questions. Try to be as honest as possible.

1. During the last month, how often would you have liked to engage in sexual activity with a partner (for example, touching each other's genitals, giving or receiving oral stimulation, intercourse, etc.)?

- | | |
|--|--|
| <input type="radio"/> Not at all | <input type="radio"/> Twice a week |
| <input type="radio"/> Once a month | <input type="radio"/> 3 to 4 times a week |
| <input type="radio"/> Once every two weeks | <input type="radio"/> Once a day |
| <input type="radio"/> Once a week | <input type="radio"/> More than once a day |

2. During the last month, how often have you had sexual thoughts involving a partner?

- | | |
|---|--|
| <input type="radio"/> Not at all | <input type="radio"/> 3 to 4 times a week |
| <input type="radio"/> Once or twice a month | <input type="radio"/> Once a day |
| <input type="radio"/> Once a week | <input type="radio"/> A couple of time a day |
| <input type="radio"/> Twice a week | <input type="radio"/> Many times a day |

3. When you have sexual thoughts, how strong is your desire to engage in sexual behaviour with a partner?

- ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No Desire

Strong Desire

4. When you first see an attractive person, how strong is your sexual desire?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No Desire

Strong Desire

5. When you spend time with an attractive person (for example, at work or school), how strong is your sexual desire?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No Desire

Strong Desire

6. When you are in romantic situations (such as a candle lit dinner, a walk on the beach, etc), how strong is your sexual desire?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No desire

Strong desire

7. How strong is your desire to engage in sexual activity with a partner?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No desire

Strong desire

8. How important is it for you to fulfill your sexual desire through activity with a partner?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Not at all important

Very important

9. Compared to other people of your age and sex, how would you rate your desire to behave sexually with a partner?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Much less desire

Much more desire

10. During the last month, how often would you have liked to behave sexually by yourself (for example, masturbating, touching your genitals etc.)?

- | | |
|--|--|
| <input type="radio"/> Not at all | <input type="radio"/> Twice a week |
| <input type="radio"/> Once a month | <input type="radio"/> 3 to 4 times a week |
| <input type="radio"/> Once every two weeks | <input type="radio"/> Once a day |
| <input type="radio"/> Once a week | <input type="radio"/> More than once a day |

11. How strong is your desire to engage in sexual behaviour by yourself?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

No desire

Strong desire

12. How important is it for you to fulfill your desires to behave sexually by yourself?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Not at all important

Very important

13. Compared to other people of your age and sex, how would you rate your desire to behave sexually by yourself?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Much less desire

Much more desire

14. How long could you go comfortably without having sexual activity of some kind?

- | | |
|--------------------------------------|---|
| <input type="radio"/> Forever | <input type="radio"/> A few weeks |
| <input type="radio"/> A year or two | <input type="radio"/> A week |
| <input type="radio"/> Several months | <input type="radio"/> A few days |
| <input type="radio"/> A month | <input type="radio"/> One day |
| | <input type="radio"/> Less than one day |

Appendix VI: Total Sexual Outlet (TSO)

1. Please specify the total number of orgasms that you experienced **during a single average week, over the last 6 months**, by whatever means (e.g. masturbation, sexual contact with others, orgasm while sleeping, etc.) _____

2. Please specify the total **maximum average** number of orgasms that you experienced **during a single week**, since age 15, **over a period of 6 months**, by whatever means (e.g. masturbation, sexual contact with others, orgasm while sleeping, etc.). In other words, the weekly average of orgasms over the 6 month period _____

Appendix VII: Survey of Sexual Behaviours (SSB)

What is your current relationship status (please check one)?

- ☐ single – not sexually active
- ☐ casual sex relationship(s)
- ☐ dating – not sexually active
- ☐ dating one person – sexually active, monogamous
- ☐ dating more than one person, sexually active
- ☐ married

The following questions ask about your sexual behaviour over the last 3 months. Please answer each item to the best of your ability. If you cannot remember an exact number, please estimate. Your answers will be kept private and anonymous.

In the past 3 months:

1. How many times have you had oral intercourse (given or received)? _____
2. With how many different partners have you had oral intercourse (given or received)? _____
3. How many times have you had unprotected (i.e. without a condom) vaginal intercourse? _____
4. How many times have you had protected (i.e. with a condom) vaginal intercourse? _____
5. With how many different partners have you had vaginal intercourse? _____
6. How many times have you had unprotected (i.e. without a condom) anal intercourse? _____
7. How many times have you had protected (i.e. with a condom) anal intercourse? _____
8. With how many different partners have you had anal intercourse? _____
9. How many times each week, on average did you masturbate? _____
10. How many hours each week, on average, did you spend viewing and/or reading _____

Appendix IX: Derogatis Sexual Functioning Inventory (DSFI) – Psychological

Symptoms Subtest

Instructions:

Below is a list of problems and complaints that people sometimes have. Please read each one carefully and click the response that best describes how much that problem has distressed or bothered you in the past two weeks including today.

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
1. Nervousness or shakiness inside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Faintness or dizziness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The idea that someone else can control your thoughts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Feeling others are to blame for most of your troubles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Trouble remembering things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Feeling easily annoyed or irritated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Pains in heart or chest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Feeling afraid in open spaces or on the streets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Thoughts of ending your life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Feeling that most people cannot be trusted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Poor appetite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Suddenly scared for no reason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Temper outbursts that you could not control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Feeling lonely even when you are with people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Feeling blocked in getting things done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Feeling lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Feeling blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Feeling no interest in things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Feeling fearful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Your feelings being easily hurt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Feeling that people are unfriendly or dislike you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Feeling inferior to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Nausea or upset stomach	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Feeling that you are watched or talked about by others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. Trouble falling asleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Having to check and double check what you do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Difficulty making decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Feeling afraid to travel on buses, subways or trains	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Trouble getting your breath	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Hot or cold spells	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Having to avoid certain things, places, or activities because they frighten you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Your mind going blank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Numbing or tingling in parts of your body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. The idea that you should be punished for your sins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Feeling hopeless about the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Trouble concentrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. Feeling weak in parts of your body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Feeling tense of keyed up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Thoughts of death or dying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Having urges to beat, injure or harm someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Having urges to break or smash things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. Feeling very self-conscious with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. Feeling uneasy in crowds, such as shopping or at the movies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Never feeling close to another person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. Spells of terror or panic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46. Getting into frequent arguments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. Feeling nervous when you are left alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. Others not giving you proper credit for your achievements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. Feeling so restless you couldn't sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

50. Feeling of worthlessness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Feeling that people will take advantage of you if you let them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Feelings of guilt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix X: Derogatis Sexual Functioning Inventory (DSFI) – Affects Subtest

Instructions:

Below is a list of words that describe the way people sometimes feel. We would like you to tell us whether you have been having any of these feelings during the past TWO WEEKS. Please indicate the degree to which you have typically each emotion by clicking the button under the response that best characterizes your experience.

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS
1. Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Regretful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Pleased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Passionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Timid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Hopeless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Blameworthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Resentful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Glad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Calm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Energetic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Loving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Tense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Worthless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Ashamed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Cheerful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Satisfied	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Active	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Anxious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Miserable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Guilty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Enraged	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Delighted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Relaxed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Vigorous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Affectionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Afraid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Unhappy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Remorseful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Bitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. Joyous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Contented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Lively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Warm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix XI: Derogatis Sexual Functioning Inventory (DSFI) – Sexual Satisfaction

Subtest

Instructions:

Below are some statements about sexual satisfaction. Please indicate whether each statement is true of you by clicking either true or false for each item. If you can't respond to some items because you have never been in a sexual relationship, please click NA (Not Applicable).

	TRUE	FALSE	NA
1. Usually, I am satisfied with my sexual partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel I do not have sex frequently enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. There is not enough variety in my sex life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Usually, after sex I feel relaxed and fulfilled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Usually, sex does not last long enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I am not very interested in sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Usually, I have a satisfying orgasm with sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Foreplay before intercourse is usually very arousing for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Often, I worry about my sexual performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Usually, my partner and I have good communication about sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GSSI

Below is a rating scale upon which we would like you to record your personal evaluation of how satisfying your sexual relationship is. The rating is simple. Make your evaluation by selecting the box that best describes your present sexual relationship.

- ☐ Not in a sexual relationship
- ☐ Could not be better
- ☐ Excellent
- ☐ Good
- ☐ Above Average
- ☐ Adequate
- ☐ Somewhat inadequate
- ☐ Poor
- ☐ Highly inadequate
- ☐ Could not be worse

Appendix XIII: Derogatis Sexual Functioning Inventory (DSFI) – Sexual

Experiences Subtest

Instructions:

Below is a list of sexual experiences that people have. We would like to know which of these sexual behaviours you have experienced. Please indicate those experiences you have personally had by selecting the button under the YES column for that experience. If you have not had the experience, select the button under the NO column. In addition, if you have had the experience during the past two months please additionally click the box under the column marked PAST 60 DAYS. Do not skip any items.

	Yes	No	Past 60 days
1. You and your partner lying together (clothed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Stroking and petting your sexual partner's genitals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Erotic embrace (clothed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Intercourse-vaginal entry from rear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Having genitals caressed by your sexual partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Mutual oral stimulation of genitals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Oral stimulation of your partner's genitals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Intercourse side-by-side	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Kissing of sensitive (non-genital) areas of the body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Intercourse-sitting position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Masturbating alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Kissing your partner's nude breasts/chest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Having your anal area caressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Breast petting (clothed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Caressing your partner's anal area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Intercourse – your partner in the superior position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Mutual petting of genitals to orgasm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Having your genitals orally stimulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Mutual undressing of each other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Deep kissing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Intercourse – you in the superior position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Anal intercourse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Kissing on the lips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Breast petting (nude)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix XIV: University of British Columbia Behavioural Research Ethics Board

Certificate of Approval



The University of British Columbia
Office of Research Services
Behavioural Research Ethics Board
Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3

CERTIFICATE OF APPROVAL- MINIMAL RISK RENEWAL

PRINCIPAL INVESTIGATOR: Kalina Christoff	DEPARTMENT: UBC/Arts/Psychology, Department of	UBC BREB NUMBER: H06-80538
INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:		
Institution	Site	
UBC	Point Grey Site	
Other locations where the research will be conducted: N/A		
CO-INVESTIGATOR(S): Boris Gorzalka Jason P. Winters		
SPONSORING AGENCIES: Unfunded Research - "Sexual Behaviour: The Roles of Sexual Arousal Regulation and Sexual Drive"		
PROJECT TITLE: Sexual Behaviour: The Roles of Sexual Arousal Regulation and Sexual Drive		
EXPIRY DATE OF THIS APPROVAL: July 3, 2008		
APPROVAL DATE: July 3, 2007		
<p>The Annual Renewal for Study have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.</p> <p style="text-align: center;">Approval is issued on behalf of the Behavioural Research Ethics Board</p>		