Sex Addiction: Neuroscience Etiology and Treatment

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AAMFT Approved Supervisor
Rates of Sex Addiction Among CD Patients (Deneke et al. 2014)

- Rates of Sex Addiction in Chemical Dependency Patients
  - Residential - 18%
  - Relapse Unit - 19%
  - Extended Care Unit – 29%

“Failure to complete a comprehensive screening for behavioral addiction may compromise substance use disorder treatment and maintain a revolving pattern of substance abstinence and relapse”
Is Sex an Addiction?

- DSM III-R contained a category called "non-paraphilic sexual addiction"

- Various authors have argued for different terms:
  - "Compulsive" (OCD, Coleman, 2003)
  - "Addictive" (Fenichel, 1945, Carnes, 1983)
  - "Impulsive" (Barth and Kinder, 1987)
  - "Hypersexual" (Stein et al., 2000, Reid/ Kafka)

- Criteria across these different conceptualizations are similar

- Is not in DSM-5

- ICD-11 draft includes “sexual compulsivity” – Narrower term “sexual addiction”
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<td>Recurrent failure (pattern) to resist sexual impulses to engage in specific sexual behavior</td>
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<td>Frequent engaging in those behaviors to a greater extent</td>
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<td>Persistent desire or unsuccessful efforts to stop, to reduce, or to control behaviors</td>
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<td>Inordinate amount of time spent in obtaining sex, being sexual, or recovering from sexual experiences</td>
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<td>Preoccupation with the behavior or preparatory activities</td>
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<td>Frequent engaging in the behavior when expected to fulfill occupational, domestic, or social obligations</td>
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<td>Continuation of behavior despite knowledge of having persistent or recurrent social, financial, psychological, or physical problem that is caused or exacerbated by the behavior</td>
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<tr>
<td>Need to increase the intensity, frequency, number or risk of behaviors to achieve the desired effect or diminished effect with continued behaviors at the same level of intensity</td>
<td>x</td>
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<td>Giving up or limiting social, occupational, or recreational activities because of their behavior</td>
<td>x</td>
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<tr>
<td>Distress, anxiety, restlessness, or irritability if unable to engage in the behavior</td>
<td>x</td>
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“Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.”

“Addiction also affects neurotransmission and interactions between cortical and hippocampal circuits and brain reward structures, such that the memory of previous exposures to rewards (such as food, sex, alcohol and other drugs) leads to a biological and behavioral response to external cues, in turn triggering craving and/or engagement in addictive behaviors.”

4 years – 80 neuroscientists

DSM-5 Field Study Report for Hypersexual Disorder
DSM-5 Hypersexual Disorder Field Trial Report

- Reid et al. (2012) conducted a field study to investigate the “clinical utility, reliability and validity of diagnostic validity of [hypersexual disorder (HD)] criteria in clinical settings” for possible inclusion in the DSM-5.
  - Also explored proposed HD specifiers and their consequences
    - Sexual behavior with consenting adults, cybersex, telephone sex and going to strip clubs
  - Examined the clinical course of HD
- Goal was to examine the inter-rater reliability of clinicians attempting to diagnose HD.

DSM-5 Proposed Criteria for Hypersexual Disorder
(Reid et al. (2012))

Table 1 DSM-5 proposed criteria for hypersexual disorder

A. Over a period of at least 6 months, recurrent and intense sexual fantasies, sexual urges, and sexual behavior in association with four or more of the following five criteria:
   1. Excessive time is consumed by sexual fantasies and urges, and by planning for and engaging in sexual behavior.
   2. Repetitively engaging in these sexual fantasies, urges, and behavior in response to dysphoric mood states (e.g., anxiety, depression, boredom, and irritability).
   3. Repetitively engaging in sexual fantasies, urges, and behavior in response to stressful life events.
   4. Repetitive but unsuccessful efforts to control or significantly reduce these sexual fantasies, urges, and behavior.
   5. Repetitively engaging in sexual behavior while disregarding the risk for physical or emotional harm to self or others.

B. There is clinically significant personal distress or impairment in social, occupational, or other important areas of functioning associated with the frequency and intensity of these sexual fantasies, urges, and behavior.

C. These sexual fantasies, urges, and behavior are not due to direct physiological effects of exogenous substances (e.g., drugs of abuse or medications), a co-occurring general medical condition, or to manic episodes.

D. The person is at least 18 years of age.

Specify if masturbation, pornography, sexual behavior with consenting adults, cybersex, telephone sex, and strip clubs

Source: http://www.dsm5.org
Method

- Included **13 raters** from a variety of fields (psychiatry, psychology, social work, marriage and family therapy, etc) practicing in outpatient settings

- Participants completed the Mini-International Neuropsychiatric Interview (MINI 6.0) a structured diagnostic interview at intake to rule out any other psychopathology that could account for HD symptoms

- They also completed the HD Diagnostic Clinical Interview, the HD Questionnaire (HDQ), the HD Course Questionnaire (HDCQ), Hypersexual Behavior Inventory (HBI); Sexual Compulsivity Scale (SCS), NEO Personality Inventory-Revised (NEO-PI-R), the Hypersexual Behavior Consequences (HBCS) and the Erotic Preferences Examination Scheme (EPES)
Procedures

- Raters were trained on how to complete the structured diagnostic interviews correctly and to assess for the proposed HD criteria.
- One rater completed and scored the initial interviews of the MINI 6.0 and HD-DCI and another rater scored it as well.
  - A third rater blind to the initial ratings administered and scored the HD-DCI two weeks later.
Results

- **Inter-rater reliability:** kappa coefficient of .93 among the clinicians
  - Indicates the diagnostic criteria can be reliably used in patients
- **Test-Retest Reliability:** “high” for the HD criteria after the two week follow-up (ϕ=.81, p<0.001)
  - Suggests reliability of the diagnostic criteria over time
- **Sensitivity=.88, Specificity=.93, Positive Predictive Power=.97, Negative Predictive Power=.74**
  - Results suggested the proposed HD criteria reflected the presenting problems well.
- **Specifiers for HD:** Pornography (81.1%) Masturbation (78.3%), Phone Sex (7.9%), Cybersex (18.1%), Strip Clubs (9.4%), Sex with Consenting Adults (44.9%)
- **Diagnostic Validity of HD criteria**
  - **High Concurrent Validity**- HDQ scores were highly correlated with HBI (r=.911) and SCS scores (r=.829)
Results Continued

- **Concurrent Validity**
  - Participants reporting having sex while experiencing negative emotions had higher Neuroticism scores on the NEO-PI-R.
  - There was a significant positive correlation between the number of consequences people reported as a result of their sexual behaviors and higher levels of hypersexual behaviors.

- **Clinical Course**: 54% of participants reported “dysregulated sexual fantasies, urges and behaviors prior to adulthood,” 30% indicated these issues started in their college years.
  - 82% endorsed a gradual progression of HD symptoms lasting months to years
  - 48.6% reported a continuous course, while 51.4% reported episodic symptoms
Conclusions

- The researchers suggested the proposed HD diagnostic criteria **could be reliably applied** to people presenting with hypersexual behaviors and was measuring a valid construct.

- However, HD was not ultimately included in the DSM-5.
Why Wasn’t HD Included in the DSM-5?

Reid and Kafka (2014) posited a number of reasons why Hypersexual Disorder was not included in the DSM-5
Politics

- Previous DSM editors openly criticized the DSM-5 Task Force and Workgroups before its publication.
- Some members of the Sexual and Gender Identity Disorders DSM-5 Task Force Committee were specifically targeted in the media.
- Some contended the HD diagnosis “confused social disapproval and morality with issues of health and disorder” (Wakefield, 2012).

Potential Legal Implications & Problems

- Concerns about potential misuse in the forensic community
  - For example, using an HD diagnosis as mitigating factor in cases of child molestation
    - No evidence a pedophilia diagnosis has ever resulted in a reduced sentence

- Authors note a recent field study of HD diagnosis in sex offenders resulted in very few diagnoses of HD
Criticisms of the Diagnostic Criteria

- Belief that the diagnostic criteria did not differentiate between high sex drives and pathological levels and activities.
- Reid and Kafka suggested individual criterion were “dissected” and rejected while neglecting the fact that a constellation of at least four of the five symptoms over 6 months would need to be present for a diagnosis.
- Some argued hypersexual behaviors could be better accounted for by another already existing psychological disorder.
Some researchers and clinicians argue hypersexual behaviors are simply variants of normal sexual behavior that an HD diagnosis is pathologizing.

There are also concerns regarding increasing the number of people diagnosed with a mental illness, the number of false positives and the number of people on unnecessary psychotropic medications.
Insufficient Empirical Research on HD

- Concerns about adding new disorders without sufficient scientific research
- There is a definite lack of epidemiological studies
- More studies with objective data ("e.g., genetic abnormality, deficits in brain function, etc") are needed as well
There is a sizeable group of sex addicts that probably do not have other comorbid disorders (Class 1 and 2).

This provides further evidence for the existence of sex addiction as a discrete disorder, as opposed to merely being symptomatic of other psychological disorders.

At the same time, about 24% of the sample (Class 4 and Class 5) likely do have other diagnosable conditions (i.e., mood disorders and anxiety disorders), and thus highlights the importance of broad-band psychological assessment to facilitate treatment planning for sex addicts.
<table>
<thead>
<tr>
<th>Clinical Profile</th>
<th>External Correlates:</th>
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<tbody>
<tr>
<td>Non-significant levels of psychopathology symptoms, with average or below average scores on PAI scales</td>
<td>Some alcohol and drug use</td>
</tr>
<tr>
<td>Low levels of distress and psychological disturbance</td>
<td>Small but positive correlations with negative legal consequences</td>
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<td></td>
<td>Negative correlation with alcohol and drug-related consequences.</td>
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<td>Negative correlation with sex-related arrests.</td>
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<td></td>
<td>Negative correlation with fantasy, pain, voyeuristic anonymous sex by SDI.</td>
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<td>Negative correlations with Core, Preoccupation, and Affect Disturbance-SAST.</td>
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## Class 2: Dysfunctional Negative Emotions (14.9%)

### Clinical Profile
- Mildly elevated cognitive and affective symptoms of anxiety
- Mildly elevated cognitive and affective symptoms of depression
- Mildly elevated levels of traumatic stress reaction
- Mild elevation in irritability
- Isolation, social withdrawal
- Disruptions in thought processes, difficulties in concentration and decision-making
- Mild elevations in alcohol and drug use

### External Correlates:
- Positive correlations with drug and chemical use.
- Some legal consequences related to drug and chemical use in general
- Positive correlation with intrusive-f sex by SDI.
Class 3: Mild Depression and Substance-Related Problems (38.1%)  

<table>
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<tr>
<th>Clinical Profile</th>
<th>External Correlates</th>
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<tr>
<td>Mild depression</td>
<td>Negative correlations with fantasy-f, intrusive-f and intrusive-p, and voyeuristic-p sex by SDI.</td>
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<tr>
<td>Mildly disturbed concentration and decision-making.</td>
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<td>Mild elevation on drug and alcohol use problems.</td>
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Class 4: Clinical Depression and Anxiety (18.8%)

Clinical Profile
- Clinically significant cognitive and affective symptoms of depression
- Clinically significant cognitive and affective symptoms of anxiety
- Clinically significant suicidal ideation
- Clinically significant symptoms of traumatic stress
- Mildly elevated somatization
- Problems with concentration and decision-making
- Social withdrawal

External Correlates
- Some legal implications
- Sexual-related convictions.
- Positive and high correlation with fantasy-f, intrusive-p, voyeuristic-f and voyeuristic-p, exhibitionistic –p, trade-p, and anonymous-p sex by SDI.
- Positive correlations with core, preoccupation, loss of control, and negative affect sexual behaviors, by SAST.
### Class 5: Severe Psychopathology (5.6%)

<table>
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<th>Clinical Profile</th>
<th>External Correlates:</th>
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<tr>
<td>Highest levels of psychopathology</td>
<td>Positive correlations with seductive-f, intrusive-f; exhibitionistic-p sex by SDI.</td>
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<tr>
<td>Severe levels of anxiety</td>
<td>Positive and highest sexual preoccupation and negative relationship disturbance by SAST.</td>
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<tr>
<td>Severe levels of depression</td>
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<td>Severe levels of traumatic stress reaction symptoms</td>
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<tr>
<td>Severe levels of suicidal ideation</td>
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<tr>
<td>Clinically significant symptoms of conversion, somatization, and health concerns</td>
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<tr>
<td>Clinically significant elevations for irritability and paranoia</td>
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<td>Clinically significant levels of social detachment and concentration difficulties</td>
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Diagnosis
Differential Diagnosis

- **DSM-5 - Possibilities:**
  - Other Specified Disruptive, Impulse Control and Conduct Disorder
  - Other Specified Sexual Dysfunction
  - Unspecified Paraphilic Disorder

- **Rule out/ or in:**
  - Antisocial / Narcissistic personality disorder
  - Paraphilia
  - Bipolar affective disorder
  - PTSD
  - ADHD
  - Substance induced disorder
  - Dissociative disorder
  - Delusional disorder
  - OCD
  - Delirium, dementia, or other cognitive disorder or organic condition
“Diagnoses that could refer to compulsive sexual behavior have been included in the DSM and ICD for years and can now be diagnosed legitimately in the United States using both DSM-5 and the recently mandated ICD-10 diagnostic coding. Compulsive sexual behavior disorder is being considered for ICD-11”

The recommended code, according to the ICD-10-CM index, is F52.8, which is the code for ‘other sexual dysfunction not due to substance or known physiological condition’; the inclusion terms of ‘excessive sexual drive’, ‘nymphomania’ and ‘satyriasis’ are listed under F52.8. DSM-5 also lists ‘other specified sexual dysfunction’ as F52.8 [13]. This diagnosis may thus be used for hypersexual disorder.

Differential Diagnosis

- Antisocials (especially w/ sex offenders) w/out addiction
- History of physical abuse
- Lacking remorse an shame
- More force/ violence in the offense
- History of other types of offenses
- More impulsive (not as many sexual urges)
- Distortions and denial
- Decreased amenability for treatment
Differential Diagnosis Continued

- Sex Addicts
- High shame
- Emotional and sexual abuse in background
- Highly sexualized (lots of preoccupation)
- Multi-addicted
- Less defenses
- High potential for suicide
- Increased amenability for treatment
Paraphilias are not Sex Addiction

- DSM-5 Paraphilias include: exhibitionism, fetishism, frotteurism, pedophilia, sexual masochism, sexual sadism, voyeurism, and transvestic fetishism.
- In DSM -5— new definition must include “psychological distress” or “distress, injury or death of unwilling persons – or those not of legal age”
Just because someone has had affairs, used prostitutes, attended a strip club, uses porn recreationally... does not mean they are a sex addict... It is just as important to determine who is NOT a sex addict as it is to determine who is.
Etiology

The making of a sex addict
Etiology

- Biology/Neuroscience/Sexual Conditioning
- Family Dynamics/Attachment
- Trauma and abuse
Neuroscience & Sexual Conditioning
Brain Regions Involved in Addiction

**Mesolimbic Dopamine (DA) Pathway:**
- Connects the ventral tegmental area to the nucleus accumbens (NAc)
- “Reward Center” tied to pleasure, reinforcement learning & impulsivity

**Amygdala:**
- Positive & negative emotional memory

**Hippocampus:**
- Processing & retrieval of long-term memories

**Prefrontal Cortex:**
- Coordinates & determines judgment & behavior
Evolutionary Function of Reward System

- Mesolimbic Dopamine Pathway is activated by salient survival-based stimuli (sex, food, nurturing, etc.).

- This system evolved to reward and encourage the organism to seek out activities necessary for survival.
Addiction in the brain

Evolutionary Adaptive System Hijacked
Addiction is a Brain Disease – Volkow et al. 2016

- Three re-occurring phases (called the “addiction circle”):
  - 1 – Binge and Intoxication
  - 2 – Withdrawal and Negative Affect
  - 3 - Anticipation and Craving
Dopamine released in reward system (nucleus accumbens)

Repeated exposure to rewards leads to cue responsivity over time – which predicts increased intake of the substance/behavior (classical conditioning)

Leads to “Incentive Sensitization” – Robinson and Berridge (1993) – stimuli associated with the reward become “cues” that trigger enhanced dopamine release signaling incentive salience and induced “wanting” (clinically described as craving).

This causes neural and molecular changes in reward system (neuroplasticity) in many brain regions

Results in the “down-regulation” of dopamine resulting in tolerance
Withdrawal and Negative Affect

- Withdrawal symptoms and negative affect are consequences of the brain's natural compensatory response to excessive dopamine.
- Brain is trying to maintain homeostasis.
- Natural rewards are experienced as less rewarding by addicted subjects than healthy subjects.
- Motivates further reward seeking behavior to stop negative affect (negative reinforcement).
Preoccupation and Anticipation Phase

- Preoccupation with obtaining the reward
- Craving
- Changes in pre-frontal regulatory circuits that leads to impaired response inhibition
How does Dopamine Down Regulation Work?
Learning, Memory & Motivation “Wanting”

- Dopamine interacts with glutamate to produce a hyper-excitble state that enhances the responsiveness of the mesolimbic dopamine reward system.

- Hippocampus records memories of intense reward.

- Amygdala records memories of environmental cues associated with the intense reward.

- Brain mistakenly treats the highly rewarding substance or behavior as **necessary for survival**, reducing “top down” inhibitory control, increasing impulsivity and motivating further action to seek out the source of pleasure.
Tolerance Reduces “Liking”

- Repeated use over time leads to over-stimulation of the dopamine reward system.

- To maintain homeostatic balance, the brain eventually down-regulates dopamine receptor availability in the striatum, producing an altered set point for pleasure.

- Substance or behavior no longer produces the intense pleasure that it did originally (tolerance).

- Other "normal" sources of pleasure don't produce a noticeable impact on the down-regulated reward system, leaving the individual feeling anxious, depressed, dysphoric & irritable (withdrawal).
Dopamine Down-Regulation is a Well-Established Finding in Addiction Research

Dopamine D2 Receptors Are Lower in Addiction

Control  Addicted
Cocaine  Meth  Alcohol  Heroin

Normal  Cocaine  Obese
Nucleus Accumbens — Brain's Reward Center

Red indicates high number of receptors for dopamine

People short of dopamine have difficulty feeling joy.

Hans Breiter, director of the Motivation and Emotion Neuroscience Center at Massachusetts General Hospital
“An orgasm is the primary natural blast of dopamine available to all of us. Accordingly, J.R. Georgiadis (2006) scanned the brains of people having orgasm. He said they resembled scans of heroin rushes. These individuals experienced one of the most addictive substance ever produced: dopamine.” (p.137).”
Effects of Drugs on Dopamine Levels

Source: Di Chiara and Imperato
Natural Rewards Elevate Dopamine Levels

Source: Di Chiara et al.

Source: Fiorino and Phillips
Koob: “The dark side of addiction”

- When the reward center can no longer be returned to its homeostatic set point it enters an “allostatic” state
- Reward system has an altered set point
- Leaves the individual susceptible to dependence and relapse
- Withdrawal is not about the physiological effects of a specific substance – it is the negative affect resulting from this allostatic state
"The truth is that just liking sex a lot doesn't make you a sex addict, and just cheating or engaging with prostitutes or other anti-social behavior doesn't make you a sex addict. If you are a sex addict, just like a heroin addict ... you are at the point where you are having sex not because you are deriving pleasure from it, but because you need to do that just to fall asleep at night and face the day, and not have withdrawal symptoms. So while true sex addiction is rare, it is one of many very real addictions that stem from the way the human brain feels - or doesn't feel - pleasure."

- The Compass of Pleasure: How Our Brains Make Fatty Foods, Orgasm, Exercise, Marijuana, Generosity, Vodka, Learning, and Gambling Feel So Good
Brain Structure and Functional Connectivity Associated With Pornography Consumption

The Brain on Porn

Simone Kühn, PhD; Jürgen Gallinat, PhD

**DESIGN, SETTING, AND PARTICIPANTS** Sixty-four healthy male adults with a broad range of pornography consumption at the Max Planck Institute for Human Development in Berlin, Germany, reported hours of pornography consumption per week. Pornography consumption was associated with neural structure, task-related activation, and functional resting-state connectivity.

**MAIN OUTCOMES AND MEASURES** Gray matter volume of the brain was measured by voxel-based morphometry and resting state functional connectivity was measured on 3-T magnetic resonance imaging scans.

**RESULTS** We found a significant negative association between reported pornography hours per week and gray matter volume in the right caudate ($P < .001$, corrected for multiple comparisons) as well as with functional activity during a sexual cue–reactivity paradigm in the left putamen ($P < .001$). Functional connectivity of the right caudate to the left dorsolateral prefrontal cortex was negatively associated with hours of pornography consumption.
Higher hours per week/more years of porn viewing correlated with a reduction in grey matter in sections of the reward circuitry (translates into sluggish reward activity, or a numbed pleasure response – desensitization)

Simone Kühn - "That could mean that regular consumption of pornography more or less wears out your reward system."

Simone Kühn continued - "We assume that subjects with a high porn consumption need increasing stimulation to receive the same amount of reward."
Neural Correlates of Sexual Cue Reactivity in Individuals with and without Compulsive Sexual Behaviours

Valerie Voon\textsuperscript{1,2,3*}, Thomas B. Mole\textsuperscript{1,3}, Paula Banca\textsuperscript{1}, Laura Porter\textsuperscript{1}, Laurel Morris\textsuperscript{1,2}, Simon Mitchell\textsuperscript{1,3}, Tatyana R. Lapa\textsuperscript{1}, Judy Karr\textsuperscript{4}, Neil A. Harrison\textsuperscript{5}, Marc N. Potenza\textsuperscript{6}, Michael Irvine\textsuperscript{1}

1 Department of Psychiatry, Addenbrooke’s Hospital, University of Cambridge, Cambridge, United Kingdom, 2 Behavioural and Clinical Neurosciences Institute, University of Cambridge, Cambridge, United Kingdom, 3 Cambridgeshire and Peterborough Foundation Trust, Cambridge, United Kingdom, 4 British Association for Counselling and Psychotherapy, London, United Kingdom, 5 Department of Psychiatry, Brighton and Sussex Medical School, Brighton, United Kingdom, 6 Departments of Psychiatry, Neurobiology and Child Study Center, Yale University, New Haven, Connecticut, United States of America

Abstract

Although compulsive sexual behaviour (CSB) has been conceptualized as a “behavioural” addiction and common or overlapping neural circuits may govern the processing of natural and drug rewards, little is known regarding the responses to sexually explicit materials in individuals with and without CSB. Here, the processing of cues of varying sexual content was assessed in individuals with and without CSB, focusing on neural regions identified in prior studies of drug-cue reactivity. 19 CSB subjects and 19 healthy volunteers were assessed using functional MRI comparing sexually explicit videos with non-sexual exciting videos. Ratings of sexual desire and liking were obtained. Relative to healthy volunteers, CSB subjects had greater desire but similar liking scores in response to the sexually explicit videos. Exposure to sexually explicit cues in CSB compared to non-CSB subjects was associated with activation of the dorsal anterior cingulate, ventral striatum and amygdala. Functional connectivity of the dorsal anterior cingulate-ventral striatum-amygdala network was associated with subjective sexual desire (but not liking) to a greater degree in CSB relative to non-CSB subjects. The dissociation between desire or wanting and liking is consistent with theories of incentive motivation underlying CSB as in drug addictions. Neural differences in the processing of sexual-cue reactivity were identified in CSB subjects in regions previously implicated in drug-cue reactivity studies. The greater engagement of corticostriatal limbic circuitry in CSB following exposure to sexual cues suggests neural mechanisms underlying CSB and potential biological targets for interventions.
Compulsive porn users react to porn cues in the same way that drug addicts react to drug cues.

Compulsive porn users craved porn (greater wanting), but did not have higher sexual desire (liking) than controls. This finding aligns perfectly with the current model of addiction.

Over 50% of subjects (average age: 25) had difficulty achieving erections with real partners, yet could achieve erections with porn.
“Our findings of enhanced attentional bias in CSB subjects suggest possible overlaps with enhanced attentional bias observed in studies of drug cues in disorders of addictions. These findings converge with recent findings of neural reactivity to sexually explicit cues in CSB in a network similar to that implicated in drug-cue-reactivity studies and provide support for incentive motivation theories of addiction underlying the aberrant response to sexual cues in CSB.”
Gola et al. (2017)

- Gave fMRIs to 28 men in treatment for problematic pornography use (PPU) and 28 men without PPU to examine ventral striatal responses to “erotic and monetary stimuli”

- Wanted to differentiate “cue-related ‘wanting’ from reward-related ‘liking’”

- Participants completed an incentive delay task during the fMRI and were given “erotic or monetary rewards preceded by predictive cues”

- PPU group had higher activation in the ventral striatum for cues that predicted erotic stimuli but not for cues that predicted monetary reward or to the actual erotic pictures
  - Authors argued this is “consistent with the incentive salience theory of addiction”

- Sensitivity to erotic stimuli cues was related to increased motivation to see the erotic stimuli (suggests “higher wanting”), higher pornography use, severity level of PPU and more frequent masturbation

- Findings congruent with research on gambling and substance addictions suggesting PPU may be a behavioral addiction

Sex addicts focus a higher-than-normal share of their attention on addiction related cues (i.e., pornography), doing so in the same basic ways and to the same basic degree as other addicts.

The brain response of sex addicts exposed to sexual stimuli (i.e., pornography) mirrors the brain response of drug addicts when exposed to drug-related stimuli. For example, the dorsal orbital prefrontal cortex lights up just as it does with substance addicts. Equally important is the fact that this region goes below baseline for neutral stimuli, the same as with substance abusers. In other words, the dorsal orbital prefrontal cortex overreacts to addiction cues and underreacts to neutral cues in all forms of addiction, including sexual addiction.
Banca et al. (2016)

- Examined whether men with CSB showed more of a preference for “sexual novelty and stimuli conditioned sexual rewards” compared to a healthy control group

- CSB group:
  - Had a stronger preference for novel sexual images in comparison to control images
  - Demonstrated a preference for cues that had been conditioned to sexual and monetary rewards over neutral outcomes
    - This result was not observed in the control group
  - Had higher levels of dorsal cingulate habituation during an fMRI when presented with repeated sexual images compared to monetary images
    - Level of habituation to sexual images was positively correlated with self-reported preference for sexual novelty
  - Had an early attentional bias to sexual cues compared to control group that significantly correlated with higher levels of approach behaviors towards cues conditioned to sexual images

- Authors concluded the CSB participants had a “dysfunctional enhanced preference for sexual novelty possibly mediated by greater cingulate habituation” as well as an overall enhanced reaction to rewards

- The novelty seeking and cue conditioning found in CSB participants is similar to results seen in studies on substance addictions

Hypofrontality

- Cognitive problems such as forgetting responsibilities
- Problems with working memory
- Increased impulsivity
- Decreased cognitive flexibility
- Decreased ability to multi-task
- Difficulties with sustaining attention
- Slower learning
- Difficulties making decisions
- Decreased emotional regulation
Our clients experience

- Powerful sexual conditioning and learning
- Neuroplastic change
- Structural changes in the brain
- Deficits in areas of functioning (e.g. memory, decision making)

- Over 30 articles on the neuroscience of sex addiction...
  - Embedded in a large body of research on behavioral addictions (130 behavioral addiction articles - e.g. 70 brain articles on internet addiction)
  - Longitudinal research in other areas
Porn and the Brain
Novelty and the “Coolidge” Effect
Gary Wilson

- Presentation of a new potential mate creates a surge of dopamine in the brain
- Becomes harder to mate with the same old partner (less dopamine is released)
- Gary Wilson “Endless online mates keep dopamine surging”
- “Males need time to recover their potency and vigor after overriding their sexual satiation mechanisms with dopamine/novelty.”
- “Porn Induced” Erectile Dysfunction – due to desensitized dopamine system in the brain – as opposed to blood flow in penis as in natural later onset
Pornography addiction – a supranormal stimulus considered in the context of neuroplasticity

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Addiction has been a divisive term when applied to various compulsive sexual behaviors (CSBs), including obsessive use of pornography. Despite a growing acceptance of the existence of natural or process addictions based on an increased understanding of the function of the mesolimbic dopaminergic reward systems, there has been a reticence to label CSBs as potentially addictive. While pathological gambling (PG) and obesity have received greater attention in functional and behavioral studies, evidence increasingly supports the description of CSBs as an addiction. This evidence is multifaceted and is based on an evolving understanding of the role of the neuronal receptor in addiction-related neuroplasticity, supported by the historical behavioral perspective. This addictive effect may be amplified by the accelerated novelty and the ‘supranormal stimulus’ (a phrase coined by Nikolaas Tinbergen) factor afforded by Internet pornography.
Supernormal Stimulus

- A supernormal stimulus or superstimulus is an exaggerated version of a stimulus to which there is an existing response tendency, or any stimulus that elicits a response more strongly than the stimulus for which it evolved.

- Nickolaas Tinbergen discovered animals (birds, gypsy moths etc) could be fooled into preferring fake mates and eggs.
It’s not how much time is spent that leads to problematic use….

- Important findings in this study are that neither time spent viewing porn on the Internet nor personality factors were associated the level of reported problems with Internet porn use.

- Instead, it was intensity of the experience and amount of novelty (different applications opened).

- “It has generally been assumed that predisposing personality problems are what make porn addiction possible, but it may be dopamine levels, quite apart from personality.”

- As it turns out, the level of reported psychological problems (e.g., social anxiety, depression, and compulsivity) appears to be related to how intense the arousal produced, and the number of applications used (degree of novelty).

- "Although we did not examine brain correlates of watching Internet pornographic pictures in our study, we found the first experimental evidence for the potential link between subjective reactivity on Internet pornographic stimuli and a tendency toward cybersex addiction."
“Erections may become conditioned to aspects of VSS [porn] that do not transition easily to real-life partner situations. Sexual arousal may be conditioned to novel stimuli, including particular sexual images, specific sexual films or even non-sexual images. It is conceivable that experiencing the majority of sexual arousal within the context of VSS may result in a diminished erectile response during partnered sexual interactions. Similarly, young men who view VSS expect that partnered sex will occur with themes similar to what they view in VSS. Accordingly, when high stimulation expectations are not met, partnered sexual stimulation may not produce an erection.”

Prause & Pfaus, 2015 Viewing sexual stimuli associated with greater sexual responsiveness not erectile dysfunction
Contemporary Vs. Classic SA
Reimersma & Sytsma (2013)

- Classic:
  - History of abuse
  - Insecure attachment
  - Poor impulse control
  - Cross Addictions
  - Co-morbid mood disorders
  - Used to soothe toxic emotions
Contemporary

- Rapid onset
- Due to explosive growth of internet technology
- Chronic exposure to graphic content online
- Content – unique, intense, graphic, limitless novelty
- Culture – trending towards virtual and non-relational sex
- Early exposure to graphic sexual material
- Sexual conditioning
- Less trauma history/attachment problems
- May not be having sex (or may never have had sex)
- May not be able to perform – can include performance anxiety, unrealistic performance standards
339 college students surveyed and found that 10.3% scored in the clinical range for cybersex addiction. Further, we found significant gender differences among the clinical and non-clinical range groups as males were more likely to score in the clinical range for cybersex addiction.

From Table 1 in the full paper (which is available in the SASH journal Sexual Addiction & Compulsivity)

- Percentage of men in the clinical range - 19%
- Percentage of women in the clinical range - 4%
Psychological Correlates of Internet Porn Use

- Levin, Lillis and Hayes (2012) found the following correlates of increased porn use in college males:
  - Depression
  - Anxiety
  - Stress
  - Poor social functioning

Porn Use & Erectile Dysfunction in Young Men

- Foresta and colleagues (2011) studied 28,000 Italian men and found higher levels of porn use was associated with higher levels of erectile dysfunction in young men.

- Landripet and Stulhofer (2015) found that moderate (but not high) levels of porn consumption were related to higher chances of young Croatian men having erectile difficulties.

- Voon (2014) found that over half (11 of 19) men with compulsive porn use reported erectile dysfunction.

- First time in history – widespread youthful ED in young men.
Rebooting for PIED

- General recovery after 2 months of no porn or masturbation
- Older guys are recovering faster than those that wired their brains to internet porn during adolescence
- Fapstronauts / “No Fap” community on Reddit
- Rebootnation.org
- Yourbrainonporn.com
Families & Attachment
Measure Flexibility
Measure Cohesion

Levels of Cohesion:
- Balanced
- Mid-Range
- Unbalanced

Levels of Flexibility:
- Chaotic
  - Lack of leadership
  - Dramatic role shifts
  - Authoritarian discipline
  - Too much change
- Flexible
  - Shared leadership
  - Democratic discipline
  - Role sharing
  - Change when necessary
- Structured
  - Leadership sometimes shared
  - Somewhat democratic discipline
  - High stability
  - Change when demanded
- Rigid
  - Authoritarian leadership
  - Strict discipline
  - Roles seldom change
  - Too little change

Levels of Cohesion:
- Disengaged
- Separated
- Connected
- Enmeshed

Levels of Flexibility:
- Chaotic
- Flexible
- Structured
- Rigid
Families of Sex Addicts

77% RIGID

87% DISENGAGED
Attachment varies by gender and sexual orientation.
Attachment Style - Norms vs. Addict Sample

Men - Norms
Women - Norms
Men - Addict Sample
Women - Addict Sample

Correlates of Porn Use in Young Men 2014

- Szymanski and Stewart-Richardson (2014)
- Higher frequencies of pornography use and problematic porn use were related to:
  - Avoidant attachment style
  - Anxious attachment style
  - Decreased sexual satisfaction
  - Increased relational problems

Trauma
Trauma and Abuse History

- Most came from families were abuse and trauma were present.
- 72% experienced physical abuse
- 81% experienced sexual abuse
- 97% experienced emotional abuse
- In addition, they came from families where shame was present.
“CSB (Compulsive Sexual Behavior) has been strongly linked to early childhood trauma or abuse, highly restricted environments regarding sexuality, dysfunctional attitudes about sex and intimacy, low self-esteem, anxiety, and depression.”

“Sexual addiction is strongly anchored in shame and trauma. Research conducted over the last fifteen years has consistently shown the prevalence of emotional, physical, and sexual abuse in this population.”

Recent Research

- Recent Study (2012) found 39% of gay and bisexual men with compulsive sexual behavior had experienced childhood sexual abuse.
- These findings are “largely consistent with previously studied self-identified community samples of individuals with CSB (Black et al., 1997; Kafka & Prentky, 1992).
- This finding is in line with Briere and Runtz’s (1990) report that childhood sexual abuse was uniquely associated with maladaptive sexual behavior, and with previous literature supporting childhood sexual abuse as a possible etiological factor in CSB development (Perera et al., 2009) (p.419).”

Assessment Tools

- SAST-R 2.0
- PATHOS
- SDI-R
PATHOS

1) Do you often find yourself preoccupied with sexual thoughts? (Preoccupied)
2) Do you hide some of your sexual behavior from others? (Ashamed)
3) Have you ever sought help for sexual behavior you did not like? (Treatment)
4) Has anyone been hurt emotionally because of your sexual behavior? (Hurt)
5) Do you feel controlled by your sexual desire? (Out of control)
6) When you have sex, do you feel depressed afterwards? (Sad)
Comprehensive battery of tests

- SAST
- Diagnostic Criteria, Anorexia, Collateral Indicators
- Co-morbid Addiction screen
- Financial Costs
- Consistency, exaggeration
- Attachment Style
- Readiness for Change
SDI Behavioral Scales

Legend

F  Fantasy & Consequences *
P  Pornography Use
NW Networking for Anonymous Sex
SG Swinging & Group Sex
CB Cruising Behavior
RA Relationship Addiction *
C  Conquest **
IS Intrusive Sex ***
HD Humiliation & Domination
PE Pain Exchange
PSC Paying for Sex, Commercial *
PSP Paying for Sex, Power ***
PS Phone Sex
VC Voyeurism & Covert Intrusions
E  Exhibitionism
ET Exploitative Sex, Trust
EC Exploitative Sex, Children
DI Drug Interaction *
OS Object Sex *
HPP Home-Produced Pornography *

* - "At-Risk" (Tscore 50-59)  ** - "At-Risk" (Tscore 60-69)
*** - "Severe Risk" (Tscore 70 or greater)
MULTIPLE ADDICTIONS
Binge / Purge Cycle

Acting Out

Extreme Control
- Dieting
- Sex Avoidance
- Saving / Hoarding
- Risk Aversion
- Compulsive Athleticism

Out of Control
- Eating
- Sex & Romance
- Alcohol
- Drugs
- Spending / Debting
- Risk-taking
- Work
- Gambling

Acting In
Treatment
<table>
<thead>
<tr>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronology of treatment is vital...</td>
</tr>
<tr>
<td>Client must be carefully detoxed and stabilized</td>
</tr>
<tr>
<td>Clients may be initially screened and assessed to see if sex addiction is present</td>
</tr>
<tr>
<td>Therapeutic alliance and supportive community established</td>
</tr>
<tr>
<td>After client is stable and is not at risk of elopement and has increased capacity for emotional regulation</td>
</tr>
<tr>
<td>- Proceed slowly on sexual issues</td>
</tr>
<tr>
<td>- Sexual issues may be associated with trauma and shame</td>
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<tr>
<td>- Manage triggers, cues</td>
</tr>
<tr>
<td>- Provide support</td>
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</tbody>
</table>
Treatment

- Programmatic care
  - Group
  - 12 step support
  - Educational component
- Celibacy agreement
- Sexual health plan
- Task methodology
- 12 step
- Mindfulness, CBT
- IFS, Trauma treatment, EMDR, SE
- Family / Couple treatment
  - Partner Trauma Treatment
  - Disclosure
Three Circle Worksheet

Boundaries with:

Boundaries with:

Boundaries with:

Abstinence List

©2007 Three Circle Workshop, Dr. Robert Canosa, Ph.D.
Task Methodology: The Process

RECOVERY START UP
40 Days
Meditations
Core Dialogues
Contracts
Assessments
Skill Building

1. Sobriety challenges worksheet
2. Identify relapse scenarios
3. Fire drill plan
4. Abstinence list, boundaries list
5. Personal Craziness Index

1. Make problem list
2. Make secret list
3. List of excuses
4. Consequences inventory
5. Find therapist, sponsor

1. Read books on sex addiction
2. Map out addiction cycle
3. List of unmanageable moments
4. Sexual anorexia/binge-purge cycle
5. Self-assessment; history

1. Sex addiction history
2. Powerlessness inventory
3. Unmanageability inventory
4. Financial costs worksheet
5. Ten worst moments

1. Damage control plan
2. Disclosure plan

©2004 Facing The Shadow: The Process. Dr. Patrick Carnes, Ph.D.
For Healing…Three Legged Stool

- Addict’s therapist
  - Individual therapy
  - Support Groups/ 12 step support
- Partner’s therapist
  - Individual therapy
  - Support Groups
- Couples therapist
Thank you!