Process Addictions—a Systematic Overview

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Conflict of Interest

• Dr. Moberg has no conflicts of interest to disclose.
Do we trivialize the term “addiction”?

Do we ‘medicalize’ behaviors that appear out of the norm?

And, who’s norm?
Agenda

• Gambling Disorder
• Internet Gaming Disorder
• Compulsive Shopping/Spending
• Sex Addiction
• Binge Eating Disorder
• Others
A Common Neurobiological Substrate?

Agenda

• Gambling Disorder
• Internet Gaming Disorder
• Compulsive Shopping/Spending
• Sex Addiction
• Binge Eating Disorder
• Others
Gambling disorder or Ludomania “game madness”

0.5% adults (1.5 million)  
Men > women

DSM-5 Diagnostic Criteria

• Requires four or more criteria from criteria A
• Criteria A.
  – Needs to gamble with increasing amounts of money in order to achieve desired excitement (TOLERANCE)
  – Is restless or irritable when attempting to cut down or stop (WITHDRAWAL)
  – Has made repeated unsuccessful efforts to control, cut back or stop
  – Is often preoccupied with gambling
  – Often gambles when feeling distressed
  – After losing money, often returns another day to get even
  – Lies to conceal the extent of involvement with gambling
  – Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
  – Relies on others to provide money to relieve desperate financial situations caused by gambling
• Criteria B.
  – Gambling is not better explained by mania
Severity

- Mild—4-5
- Moderate—6-7
- Severe—8-9
Clinical Similarities

- Early age of onset
- Chronic relapsing patterns
- Tolerance and withdrawal
- Inability to abstain or “cut down”
- Persistent use despite negative consequences
- Tension or arousal before (anxiety vs. excitement)
- Relief during (“high”)
- Many resolve on their own
- Probability discounting (going for larger, less probable reward)
- Altered delay discounting (going for immediate, smaller rewards)
- Telescoping

Gambling disorder

- Nicotine—60.1%
- Any substance use disorder—57.5%
- Any mood disorder—37.9%
- Any anxiety disorder—37.4%
- Anti-social personality disorder—28.8%

Risk for compulsive buying

False beliefs = Cognitive distortions

• Gambler’s fallacy
• Chasing one’s losses
• Near miss
• Superstitions
Anti-Parkinsonian Medications

• Dopamine replacement therapy—all D receptors
  – levodopa
• Monoamine oxidase inhibitors
  – Selegiline
• Dopamine agonists—D2/D3
  – Bromocriptine
    • Parlodel®
  – Amantadine
    • Symmetrel®
  – Ropinirole
    • Requip®
  – Pramipexole
    • Mirapex®

Anti-Parkinsonian Medications

- Gambling
- Hypersexuality
- Spending
- Binge Eating
- Skin picking
- Pathological internet use

WASHINGTON—The Food and Drug Administration on Tuesday warned of rare cases in which patients taking the antipsychotic medication Abilify have experienced uncontrollable urges to gamble, binge eat, shop and engage in sex. The drug is also sold under the generic name aripiprazole and the brand names Abilify Maintena and Aristada. The FDA noted that such cases, while rare, can in theory affect anyone taking the medication.

Treatment

- Cognitive Behavioral Therapy
- Mindfulness
- Motivational Interviewing
- 12 step
- Financial Planning
- Self exclusion
- Medication Assisted Treatment
THERE ARE NO FDA APPROVED MEDICATIONS TO TREAT GAMBLING DISORDER OR ANY OTHER PROCESS ADDICTION
Medication Assisted Treatment—Gambling Disorder

- Opioid antagonists
  - Nalmefene—Grant et al., 2006; Grant et al., 2010
  - Naltrexone—Kim et al., 2001; Grant et al., 2008; Grant et al., 2008
- Selective serotonin reuptake inhibitors (mixed to negative)
  - Paroxetine—Kim et al., 2002
  - Fluvoxamine—Hollander et al., 2000; Blanco et al., 2002
  - Sertraline—Saiz-Ruiz et al., 2005
  - Escitalopram—Grant & Potenza, 2006; Black et al., 2007
- N-Acetyl Cysteine—Grant et al., 2007
- Carbamazepine—Black et al., 2008
- Lithium—Pallanti et al., 2002; Hollander et al., 2005 (patients with bipolar disorder)
- Amantadine—Pettorruso et al, 2012 (CR); Thomas et al., 2010 (PD patients)
- Topirimate—Dannon et al., 2005 (may limit impulsivity)
- Modafanil—Zack & Poulos, 2009
- Memantine—Grant et al., 2010
- Acamprosate—Black et al, 2011
- Tolcapone—Grant et al., 2013
- Bupropion—Dannon et al., 2005

Agenda

• Gambling Disorder
• Internet Gaming Disorder
• Compulsive Shopping/Spending
• Sex Addiction
• Binge Eating Disorder
• Others
Not just internet
Incidence varies

0.2%

50%

Co-morbidities

- ADHD—39.1%
- Depression, Anxiety, Social Anxiety

MMORPGs
Massively Multiplayer Online Role Playing Games
46%

Goals: Be social and be immersed in the game.

Internet café
Physiologic consequences

- Obesity
- Venous Thrombo-embolic Disease
- Sleep disorders
- Carpal tunnel syndrome
- Dehydration
- Electrolyte abnormalities
- Seizures
- Sudden Cardiac Death

Fox News.com, August 1, 2011
NY Daily News, December 12, 2013
Man dies in Taiwan after 3-day online gaming binge

By Katie Hunt, CNN and Naomi Ng, for CNN

📅 Updated 6:53 PM ET, Mon January 19, 2015 | Video Source: CNN

The first death was a man who had been playing games for five days straight.
The 32-year-old man with the surname Hsieh died from cardiac failure, and an employee found him motionless on the morning of Jan. 8, CNN reported Monday. Hsieh entered the cafe on Jan. 6, according to Jennifer Wu, a police spokesperson from Taiwan’s Hunei district.

The man was reportedly a regular customer who often played for days.
in the USA

• Benjamin Walker died from hitting his head on a table and sustaining internal injuries during a game-induced seizure, January 2001.

• Shawn Woolley committed suicide suspected to be related to a rejection in *EverQuest*, November 2001.

• Davin Moore went on a crime spree, attacked and killed 3 officers before taking off in a police cruiser like Grand Theft Auto, June 2003.

• Daniel Petric shot his parents, killing his mother, after they took away his copy of Halo 3, October 2007.

• Alexandra Tobias pleaded guilty to second-degree murder for shaking her baby to death for interrupting her playing a facebook game, 2010.

Teen Who Killed Over Video-Game gets 23 years, nbcnews.com, 6/16/2009.
Gaming marathon

Brian Vigneault, 35
“PoShybRiD”
Virginia Beach, VA

TREATMENT

Fasting camps
NY Post, August 27, 2013

outpatient

Inpatient centers in Washington and Pennsylvania

Kuss, 2013
Treatment

CNN, April 26, 2016
www.cnn.com

China
“Boot camp”
The US conundrum

IS IT A DISEASE?
Internet gaming disorder
DSM-5; Section 3

- Pre-occupation with Internet games (not including gambling)
- Withdrawal (irritability, sadness, anxiety—no physical signs)
- Tolerance
- Unsuccessful attempts to stop or cut down
- Loss of interest in previous hobbies or entertainment
- Continued use despite knowledge of psychosocial problems
- Has deceived family members, therapists or others regarding use
- Use of gaming to relieve dysphoric mood
- Lost or jeopardized a significant relationship, job or educational career opportunity because of participation in Internet games.
- Exclusions—gambling, use of Internet for required business activities, other recreational or social Internet use, sexual Internet sites
Internet gaming disorder

Exclusions—gambling, use of Internet for required business activities, other recreational or social Internet use, sexual Internet sites
On-Line Gamers Anonymous
On-Line Gamers-Anon

www.olganon/org/home
Psychological Therapy

Medication Assisted Treatment

- Bupropion
- Escitalopram
- Methylphenidate
- Other SSRIs and clomipramine


Agenda

• Gambling Disorder
• Internet Gaming Disorder
• **Compulsive Shopping/Spending**
• Sex Addiction
• Binge Eating Disorder
• Others
Oniomania
Women vs. Men

80-95%?

6% 5.5%

Koran et al. 2006.
Women shop...

...but men collect!
Other factors

- Lower income (< $50,000)
- Younger age (39.7 years vs. 48.7 years)

Koran et al. 2006.
Items purchased in descending order

- Clothing
- Shoes
- Compact discs
- Jewelry
- Cosmetics
- Household items
Compulsive buying/shopping addiction

- Any mood disorder—95%
- Any anxiety disorder—80%
- Major depressive disorder—62.6%
- Any personality disorder—59%
- Any impulse control disorder—40%
- Any eating disorder—35%
- Any substance use disorder—30%
- Obsessive compulsive disorder—18.7%
- PTSD—13.5%
- Social anxiety disorder—9.1%
- Bipolar disorder—4.7%

## Compulsive Buying Scale

<table>
<thead>
<tr>
<th>Number</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If I have any money left at the end of the pay period, I just have to spend it.</td>
</tr>
<tr>
<td>2a</td>
<td>Felt others would be horrified if they knew of my spending habits.</td>
</tr>
<tr>
<td>2b</td>
<td>Bought things even though I couldn't afford them.</td>
</tr>
<tr>
<td>2c</td>
<td>Wrote a check when I knew I didn't have enough money in the bank to cover it.</td>
</tr>
<tr>
<td>2d</td>
<td>Bought something in order to make myself feel better.</td>
</tr>
<tr>
<td>2e</td>
<td>Felt anxious or nervous on days I didn't go shopping.</td>
</tr>
<tr>
<td>2f</td>
<td>Made only minimum payments on my credit cards.</td>
</tr>
</tbody>
</table>

Treatment

Agenda

• Gambling Disorder
• Internet Gaming Disorder
• Compulsive Shopping/Spending
• **Sex Addiction**
• Binge Eating Disorder
• Others
Is sex an addiction?
YES

WHY NOT?

Grant & Chamberlain. 2016.
What is normative sex?
Number of publications in Google Scholar using key terms related to compulsive sexual behavior (CSB) or problem gambling

Paraphilia/Paraphilic Disorder in DSM-5

- Paraphilias
  - Anomalous activity preferences
    - Courtship disorders
      - Voyeuristic disorder
      - Exhibitionistic disorder
      - Frotteuristic disorder
    - Algolagnic disorders (pain and suffering)
      - Sexual masochism disorder
      - Sexual sadism disorder
  - Anomalous target preferences
    - Pedophilic disorder
    - Fetishistic disorder
    - Transvestic disorder
Paraphilic disorders

• Paraphilias that...
  – Cause distress or impairment to the individual
  – Cause personal harm or risk of harm to others
Proposed Diagnostic Criteria—Summary

• Recurrent and intense sexual fantasies, urges, behaviors (4 of 5 criteria)
  – Excessive time (planning and actual behavior)
  – Behavior as a response to dysphoria
  – Behavior as a result of stressful events
  – Unsuccessful efforts to control or reduce behavior
  – Disregard for consequences to self or others

• Distress and Impairment

• Not due to substances

• 18 years of age

Specify if masturbation, pornography, strip clubs, behavior with consenting adults, cybersex, telephone sext.
Specify if in remission.

Proposed Diagnostic Criteria

- Repeatedly failed to resist impulses to engage in a specific sexual behavior.
- Engaged in sexual behaviors greater extent/longer period than intended.
- Desire to or unsuccessful efforts to cut down.
- Excessive time spent obtaining sex, being sexual or recovering from sexual experiences.
- Obsessed with preparing for sexual activities.
- Engaged in sexual behavior when expected to be fulfilling other social, domestic, occupational or academic obligations.
- Continued sexual behavior despite social, financial, psychological or physical problems.
- Increased intensity, frequency, number, or risk of sexual behaviors to achieve desired effect. (TOLERANCE)
- Given up social, occupational or recreational activities because of sexual behavior.
- Became upset, anxious, restless, or irritable if unable to engage in sexual behavior (WITHDRAWAL)

Behavior

Consequences
Co-morbidities

- Any anxiety disorder—96%
- Any mood disorder—71%
- Any sexual dysfunction—46%
- Any personality disorder—46%
- Any impulse control disorder—38%
- Obsessive compulsive disorder—14%

Treatment

• Cognitive Behavioral Therapy
• Dialectical Behavioral Therapy
• 12 step groups
• Medications

12 step groups

- Sex Anonymous
- Sexaholics Anonymous
- Sex Addicts Anonymous
- Sex and Love Addicts Anonymous
- Sexual Compulsives Anonymous

Rosenberg et al. 2014.
Medications

Rosenberg et al. 2014.
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- Others
The obesity epidemic—2016

https://www.cdc.gov/obesity/data/prevalence-maps.html
Consequences

• Chronic Pain
• Obesity
• Diabetes mellitus
• Major depressive disorder

Brownley et al. 2016.
DSM-5

• Recurrent episodes of binge eating (both)
  – Eating in a discrete period of time an amount that is larger than most would eat under similar circumstances.
  – Lack of control
• Associations (3 or more)
  – Eating rapidly
  – Eating until uncomfortably full
  – Eating large amounts when not hungry
  – Eating alone because of embarrassment
  – Feeling disgusted with oneself, depressed or very guilty afterward
• Marked distress
• Once a week for three months
• Not associated with compensatory behavior as in bulimia nervosa and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa.
Treatment—Binge Eating Disorder

- Dietary changes
- Increased exercise
- 12 step
- Medications
Outcomes

• Obsessive Thoughts
• Weight Loss
• Resolution of negative mood symptoms
• Anxiety regarding body shape and weight
Treatment Evidence

• Cognitive Behavioral Therapy (therapist led)
• Lisdexamfetamine

• Cognitive Behavioral Therapy (partially therapist led or self guided)
• Topiramate (weight loss)
• Second generation anti-depressants (weight neutral)
  – Fluoxetine
  – Sertraline
  – Citalopram

Brownley et al. 2016.
Lisdexamfetamine (Vyvanse®)
Schedule II
Lisdexamfetamine (Vyvanse®)
Schedule II
lysine
Obesity medications
Phentermine/Topiramate (Qsymia®) Schedule IV
Locaserin (Belviq®)
Schedule IV

5-HT$_{2C}$ agonist
Naltrexone/Bupropion (Contrave®)
Orlistat (Xenical® & Alli®)
Bariatric surgery

Adjustable Gastric Band Procedure

- Esophagus
- Diaphragm
- Flow of Food
- Small Stomach Pouch
- Adjustable Gastric Band
- Small Intestine
- Remainder of Stomach

Pouch

Roux Limb

Bypassed Small Intestines
Roux-en-Y Gastric Bypass
- Long-term, sustained weight loss
- Little protein-calorie malabsorption
- Few vitamin or mineral deficiencies
- Technically difficult procedure

LAP-BAND®
- Inserted laparoscopically reducing risks
- Fewer dietary deficiencies
- Less weight loss
- Adjustable
- FDA approved
- Relatively easy surgical procedure

Vertical Sleeve Gastrectomy
- Good weight loss
- Fewer dietary deficiencies
- Good weight loss
- Hunger-producing hormones are lowered
- No foreign body used
- No long-term data
Based on current studies, gastric bypass surgery is associated with:

- Accelerated alcohol absorption
- Higher maximum alcohol concentration
- Longer time to eliminate alcohol in both men and women
- Increased risk for development of AUD

Agenda

- Gambling Disorder
- Internet Gaming Disorder
- Compulsive Shopping/Spending
- Sex Addiction
- Binge Eating Disorder
- **Others**
  - Exercise
  - Tanning
  - Sugar and Chocolate
And now, in the have we gone too far department...
World Health Organization

150 minutes moderate intensity aerobic exercise/week

Physical Activity/Inactivity

All cause mortality
Coronary Heart Disease
DM II
Breast Cancer
Colon Cancer

Strong evidence of lower rates of:
- all-cause mortality
- coronary heart disease
- high blood pressure
- stroke
- metabolic syndrome
- type 2 diabetes
- breast cancer
- colon cancer
- depression
- falling

Strong evidence of:
- higher level of cardiorespiratory and muscular fitness
- healthier body mass and composition
- enhanced bone health
- higher level of functional health
- better cognitive function

Anorexia Athletica

Secondary exercise addiction

Theoretical Models

**Sympathetic Arousal Hypothesis**—down regulation of adrenergic monoamines

**Cognitive Appraisal Hypothesis**—loss of coping skills

**Four Phase Model** for Exercise Addiction
- Phase I—Recreational Exercise
- Phase II—At-risk Exercise
- Phase III—Problematic Exercise
- Phase IV—Exercise Addiction

**Elite Athlete Model**—achievement of higher sports goals

Biology

β endorphin

Freimuth et al. 2011.
Co-existing disorders

- 39-48% with AN or BN
- Body Image Disorders
- Anxiety
- Depression
- Shopping/Spending

AN = anorexia nervosa
BN = bulimia nervosa

Treatment

Cognitive Behavioral Therapy
Burning Question: Can You Get Addicted to Sunbathing?

WSJ, July 19, 2016.
Tanorexia?

One of the indications of tanning addiction is resemblance to an Oompa Loompa.
Why tan?

- To look good (90%)
- To feel good (69%)
- Relaxation (56%)

Another CAGE

• Have you tried to stop tanning but still continue?
• Do you ever get annoyed when people tell you not to tan?
• Do you ever feel guilty that you tan too much?
• When you wake up in the morning do you want to tan?

Kourosh et al. 2010.
DSM-IV

Tolerance
More time in the sun or tanning bed to maintain tan?

Withdrawal
Feel unattractive or anxious if tan is not maintained?

Loss of Control
Feel like you should stop tanning or cut down?
Prior attempts to stop tanning?

Compulsive Use
Missed an engagement to tan?

Continued Use Despite Adverse Consequences
Trouble at work or other context due to tanning?
Continue to tan despite knowledge of potential cosmetic or health consequences?
History of skin cancer or family history of skin cancer?

Kourosh et al. 2010.
Sequela

Actinic Keratosis

Melanoma

Squamous cell carcinoma

Merkel cell carcinoma
Ultraviolet Preference

**Figure 2** Change in Desire to Tan in individual subjects pre- and post-sham ultraviolet radiation (UVR) and UVR exposure sessions.

Harrington et al. 2012.

OFC = Orbitofrontal cortex
STG = Superior temporal gyrus

SPECT
Single Photon Emission Computed Tomography
Inferences

• Striatum—emotional response of reward
  – Nicotine
  – Monetary
• Orbitofrontal cortex—evaluation of reward
  – Monetary
  – Methamphetamine
  – Cocaine
• Insula—evaluation of expressive, evaluative, expressive aspects of internally generated emotions
  – Chocolate
  – Cocaine

Harrington et al. 2012.
The prelude to withdrawal

Naltrexone

Kaur et al. 2006.
Results

Kaur et al. 2006
Vitamin D

POMC = Proopiomelanocortin
REALLY?
“It is inhumane, in my opinion, to force people who have a genuine medical need for **coffee** to wait in line behind people who apparently view it as some kind of recreational activity.”

Dave Barry

[Website Link] www.coffeeforless.com
Chocolate is not an addiction; it is simply a real necessity.

© Candy Ink - All Rights Reserved
www.CandyInk.Etsy.com
Nehlig. 2012.
Nehlig. 2012.
Summary

• Process Addictions include a wide variety of behaviors.
• Gambling disorder is the best understood process addiction.
• The knowledge base is variable with regards to other process addictions regarding diagnosis, etiology and treatment.
• There is controversy over whether certain behavior patterns even constitute an addiction.