Food Wars: Eating Disorders Along the Addiction Spectrum

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Outline

- Types of Eating Disorders
- Link between EDs and SUDs
- Conceptualization of EDs in the Addiction Spectrum
- Food Addiction Research
- 12 step facilitation for EDs
- Treatment implications

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Types of EDs

- Most common to least: Binge-eating disorder (BED), Bulimia nervosa (BN), Anorexia nervosa (AN with binge-purge and restricting types)
- Up to 30 million Americans have eating disorders
- Females > males but on the rise in each
- Males most represented in BED

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Wade, T.D., Keski-Rahkonen, A., and Hudson, J. (2011). Epidemiology of eating disorders. In M. Tsuang and M. Tohen (Eds.) *Textbook in Psychiatric Epidemiology* (3rd ed). (pg. 343-360). New York : Wiley.

Prevalence

- AN: 0.9 percent of women and 0.3 percent of men
- BN: 1.5 percent of women and 0.5 percent of men
- BED: 3.5 percent of women and 2 percent of men.
- Coexisting mood, anxiety, impulse-control, or substance use disorders very common.

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Hudson JI, Hiripi E, Pope HG, Kessler RC. The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication . *Biological Psychiatry* 2007; 61:348-358.

DSM V Diagnosis

- Anorexia Nervosa: characterized by self-starvation, an abnormally low body weight, along with an intense fear of being fat and a disturbed self-image.
- The requirement of low weight is now defined in the context of "age, sex, developmental trajectory, and physical health," (rather than the old threshold of 85% of IBW).
- Amenorrhea removed as a criterion.

DSM V Diagnosis

- Bulimia Nervosa: characterized by episodes of binge eating followed by inappropriate compensatory behaviors to avoid weight gain (vomiting, laxative abuse, diuretic abuse, and over-exercise).
- Bulimia nervosa no longer has subtypes
- Requires only one binge per week with compensatory behavior, for at least 3 months

DSM V Diagnosis

- BED: characterized by binge eating without inappropriate compensatory behaviors.
- Frequency at least once per week for 3 months
- Patients are often obese but not always, have greater functional impairment, and are more likely to develop metabolic syndrome than obese patients without an ED.

DSM V Diagnosis

Other Specified Feeding and Eating Disorders (OSFED, used to be ED-NNOS):

- Atypical anorexia nervosa (if the patient is not underweight)
- Sub-threshold bulimia nervosa
- Sub-threshold binge eating disorder
- Purging disorder
- Night eating syndrome
- Up to 30% of treatment-seeking patients

ED & SUD Link

- Food for Thought - Substance Abuse and Eating Disorders (CASA report) and National Comorbidity Survey Replication
- CASA report was first comprehensive examination of the link between SA and EDs
- Reveals that up to 50% of individuals with EDs also abuse alcohol or illicit drugs, compared to 9% of the general population.
- Up to 35 % of alcohol or illicit drug abusers have eating disorders compared to 3% of the general population.

National Center on Addiction and Substance Abuse (CASA) at Columbia University. (2003). ***Food for Thought: Substance Abuse and Eating Disorders***. New York, National Center on Addiction and Substance Abuse.

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Hudson, Hiripi, Pope, and Kessler. The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication. Biol Psychiatry 2007, Feb. 1; 61 (3):348-358.

CASA Report: Other Findings

- Middle school girls (10 – 14 year olds) who diet more than once a week are nearly 4X's more likely to become smokers.
- Girls with eating disorder symptoms are almost 4X's more likely to use inhalants and cocaine.
- 12.6 % of female high school students take diet pills, powders or liquids to control their weight without a doctor's advice.

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National Center on Addiction and Substance Abuse (CASA) at Columbia University. (2003).***Food for Thought: Substance Abuse and Eating Disorders***. New York, National Center on Addiction and Substance Abuse.

CASA Report: Other Findings

- Women with BN who are EtOH dependent compared with those who are not report higher rates of:
  - suicide attempts
  - anxiety
  - personality disorders
  - conduct disorders
  - other drug dependence

- As many as one million men and boys suffer from an eating disorder; gay and bisexual males are at increased risk of such disorders.

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National Center on Addiction and Substance Abuse (CASA) at Columbia University. (2003). ***Food for Thought: Substance Abuse and Eating Disorders***. New York, National Center on Addiction and Substance Abuse.

ED & SA

- BN, purging type
  - most commonly linked to substance abuse
  - Also high in AN, binge-purge type, and BED
- Substances include:
  - Alcohol (most common), amphetamines, cocaine, benzodiazepines (ex., Ativan, Klonopin, Xanax), heroin, caffeine, tobacco, diuretics, and laxatives
  - Substance used to self-medicate negative emotions and obsessive thoughts (body concern), to suppress appetite, to increase metabolism
- Health professionals often overlook the link between substance abuse and eating disorders
- Integrated txt options are scarce

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National Center on Addiction and Substance Abuse (CASA) at Columbia University. (2003).***Food for Thought: Substance Abuse and Eating Disorders***. New York, National Center on Addiction and Substance Abuse.

Shared Risk Factors

- ***TRAUMA***
  - History of sexual abuse, physical abuse, emotional abuse and/or neglect
- Both EDs and SA occur in times of transition or stress
- Common brain chemistry
- Common family history
- Low self esteem, perfectionism
- Depression, anxiety, impulsivity
- Unhealthy parental behaviors and low monitoring of children's activities
- Unhealthy peer norms and social pressures
- Susceptibility to messages from media

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National Center on Addiction and Substance Abuse (CASA) at Columbia University. (2003).***Food for Thought: Substance Abuse and Eating Disorders***. New York, National Center on Addiction and Substance Abuse.

“Addiction” Defined

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ASAM Definition of Addiction

- 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.
- Reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.

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•http://www.asam.org/research-treatment/definition-of-addiction

Definition of Addiction

- Addiction is characterized by
  - inability to consistently abstain,
  - impairment in behavioral control (impulsive/compulsive use),
  - craving,
  - diminished recognition of significant problems with one's behaviors and interpersonal relationships,
  - a dysfunctional emotional response.
- Addiction often involves cycles of relapse and remission.
- Without engagement in recovery, addiction is associated with high morbidity and mortality.

Definition of Addiction

- Addiction affects neurotransmission and interactions between the frontal cortex, the hippocampus and brain reward structures.
- Memory of previous exposures to rewards (food, sex, alcohol and other drugs) leads to a biological and behavioral response to external cues.
- This triggers craving and/or engagement in addictive behaviors.

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•http://www.asam.org/research-treatment/definition-of-addiction

Types of Addiction

- Substance: ingested substance directly causes release of dopamine and opiates in brain's reward center
  - Ex. Alcohol, caffeine, nicotine, illicit/prescription drugs, food
- Process: dopamine and endogenous opiates released when engaging in the process
  - Ex. Gambling, sex, work, exercise, binge/purge behavior, food restriction, internet, shopping

Food Addiction

- Conceptualization of eating related behaviors
- Process addictions: disorders of impulsive and compulsive behaviors (starving, eating, overeating, purging, over-exercise)
- Substance addiction: addiction to food as substance, a subgroup of patients with EDs
- Patients with long hx, high dose effect (binging behaviors), identifiable trigger foods, personal and/or family hx of SUD, failed multiple trials of standard treatment

Food and Reward

- Dopamine system:
  - Neuroimaging research--the reward values of both food and substances of abuse are associated with increased level of extracellular dopamine in the nucleus accumbens.
  - PET imaging studies--reduced levels of dopamine receptors are related to both obesity and drug dependence.
- Opiate system:
  - Both alcohol and high-fat sweets can cause the release of endogenous opioids in the brain.

•Volkow ND, Wang GJ, Fowler JS, et al. "Nonhedonic" food motivation in humans involves dopamine in the dorsal striatum and methylphenidate amplifies this effect. *Synapse. 2002;44:175–180.*

•Wang G-J, Volkow ND, Freimuth P, et al. Brain dopamine and obesity. *Lancet. 2001;357:354 –357.*

•Drewnowski A, Krahn DD, Demitrack MA, et al. Naloxone, an opiate blocker, reduces the consumption of sweet high-fat foods in obese and lean female binge eaters. *Am J Clin Nutr. 1995;61:1206 –1212.*

The Addiction Spectrum: Applied to Eating Disorders

- Primary, progressive, chronic disease
- Family disease
- Dependence and withdrawal symptoms
- Complex etiology: bio-psycho-social-spiritual
- Relapsing course is common
- Some effects of the disease are irreversible (osteoporosis, scarring)
- **Potentially Fatal--significant morbidity/mortality: AN mortality rate of 5% per decade of illness, with 50% of deaths occurring by suicide (Sullivan 1995)**
- Full and sustained recovery is real and possible for the patient and the family

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Similarities--Etiology

- Primary diseases, co-occurring psychiatric illness common, high prevalence of ED and SA co-occurring
- Family disease:
  --ED pts and CD pts frequently have a family history of alcoholism or addiction in a parents and/or grandparents
  --Genetic predisposition
- Trauma history is common in women with eating disorders and those with substance abuse

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Similarities--Behavioral

- Loss of control
- Unsuccessful attempts to cut down or stop the behavior
- Great deal of time spent thinking about or engaging in the behavior
- Continuing despite negative consequences related to the behavior

Similarities—Course of Illness

- Withdrawal symptoms including HA, irritability, restlessness, insomnia, depressed mood, SI
- Need for increased amounts of the substance or behavior (tolerance)
- Negative impact on social, occupational or recreational activities (diseases of isolation)
- Limited affect tolerance, affect regulation and interpersonal effectiveness skills

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Research: Reward, Eating and Addiction

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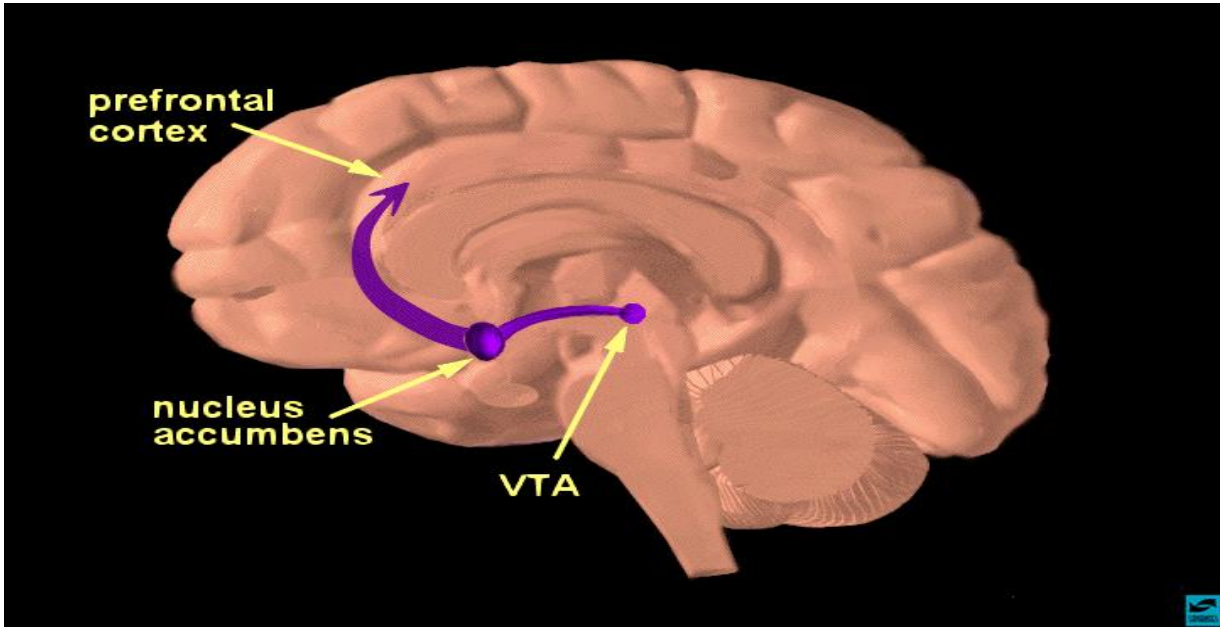
The Brain Reward Pathway



- Major structures: the ventral tegmental area (VTA), the nucleus accumbens and the prefrontal cortex.
- Pathway activated by a “rewarding” stimulus.

So-Called “Natural” Addictions

- The reward pathway also mediates the positive emotional effects of natural rewards: food, sex and social interactions.
- These regions are implicated in compulsive consumption of natural rewards: compulsive overeating, exercise addiction, and sexual addictions.
- Preliminary findings suggest that shared pathways are involved: cross-sensitization occurs between natural rewards and drugs of abuse;
- Relapse common in both ED and SA recovery

Sucrose-Dependent Rats

- N. M. Avena and B. G. Hoebel: A diet promoting sugar dependency causes behavioral cross-sensitization to a low dose of amphetamine. *Neuroscience, Volume 122, Issue 1, 20 November 2003, Pages 17-20.*
- Implication:
  - A diet comprised of alternating deprivation and access to a sugar solution and chow produces bingeing on sugar that leads to a long lasting state of increased sensitivity to amphetamine, possibly due to a lasting alteration in the dopamine system.

Yale Food Addiction Scale

- Developed to identify those exhibiting signs of addiction toward food high in fat and/or sugar
- Based on DSM-IV TR substance dependence criteria
- Adequate internal reliability
- Good validity compared with other measures of eating problems

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Ashley N. Gearhardt *, William R. Corbin, Kelly D. Brownell. Preliminary validation of the Yale Food Addiction Scale. Appetite 52 (2009) 430–436.

Sample Questions YFAS

IN THE PAST 12 MONTHS:

1) I find that when I start eating certain foods, I end up eating much more than I had planned (Never, 1 X/month or less, 2-4X's/month, 2-3X's/week, 4 or more X's/week)
2) Not eating certain types of food or cutting down on certain types of food is something I worry about.
3) I spend a lot of time feeling sluggish or lethargic from overeating.
5) I kept consuming the same types or amount of food even though I was having emotional and/or physical problems--Yes/No
6) Over time, I have found that I need to eat more and more to get the feeling I want, -Yes/No

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Ashley N. Gearhardt *, William R. Corbin, Kelly D. Brownell. Preliminary validation of the Yale Food Addiction Scale. Appetite 52 (2009) 430–436.

Human Studies: Food Addiction

- Yale Study—hypothesis: elevated "food addiction" scores are associated with similar patters of neural activation as substance dependence.
- N=48 healthy young women ranging from lean to obese
- Measurement: relation between elevated food addiction scores and fMRI activation in response to receipt and anticipated receipt of chocolate milkshake.
- Used the Yale Food Addiction Scale
  - 25 item measure (Likert Scale)
  - Assesses signs of substance-dependence symptoms in eating behavior: Tolerance, Withdrawal, Loss of control

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Gearhardt, AN, et. al. 2011. Neural correlates of Food Addiction. Arch Gen Psychiatry. 321-329

Medial Orbitofrontal Cortex

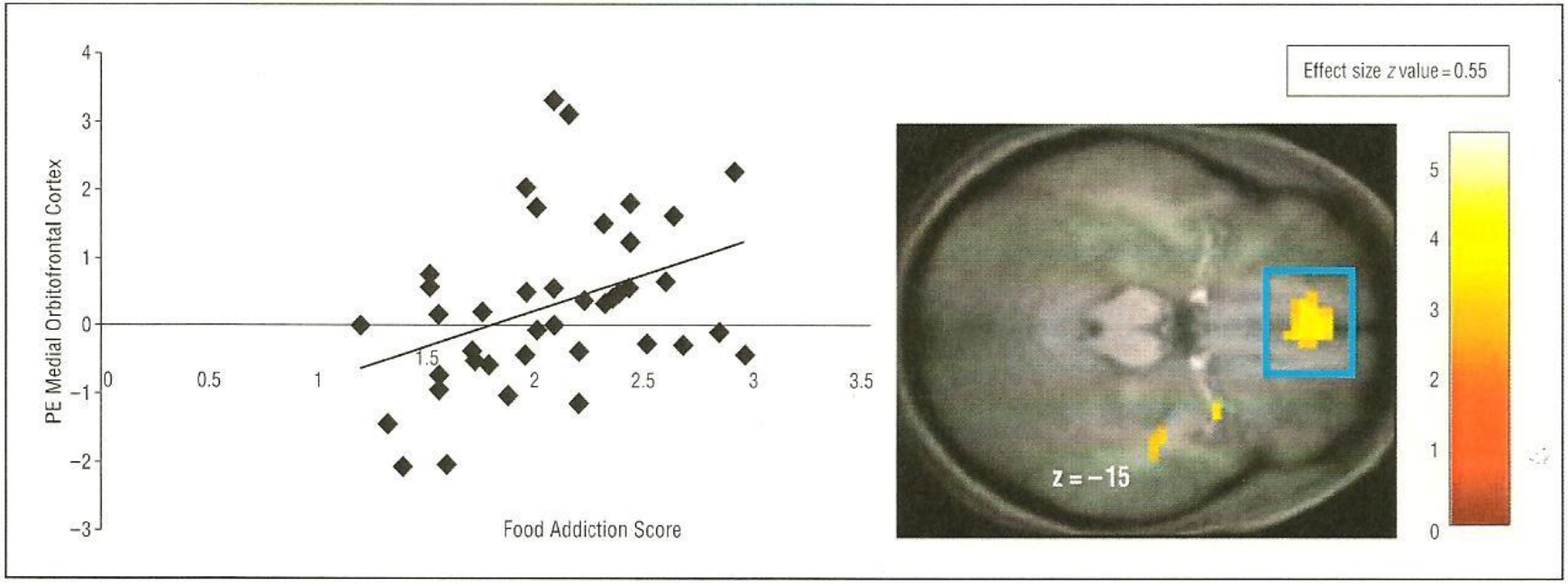

Figure 3. Activation in a region of the medial orbitofrontal cortex (Talairach coordinates x, y, z: 3, 42, −15; z=3.47; false discovery rate–corrected P=.004) during milkshake cues vs tasteless solution cues as a function of Yale Food Addiction Scale scores, with the graph of parameter estimates (PE) from that peak.

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Gearhardt, AN, et. al. 2011. Neural correlates of Food Addiction. Arch Gen Psychiatry. 321-329

Lateral Orbitofrontal Cortex

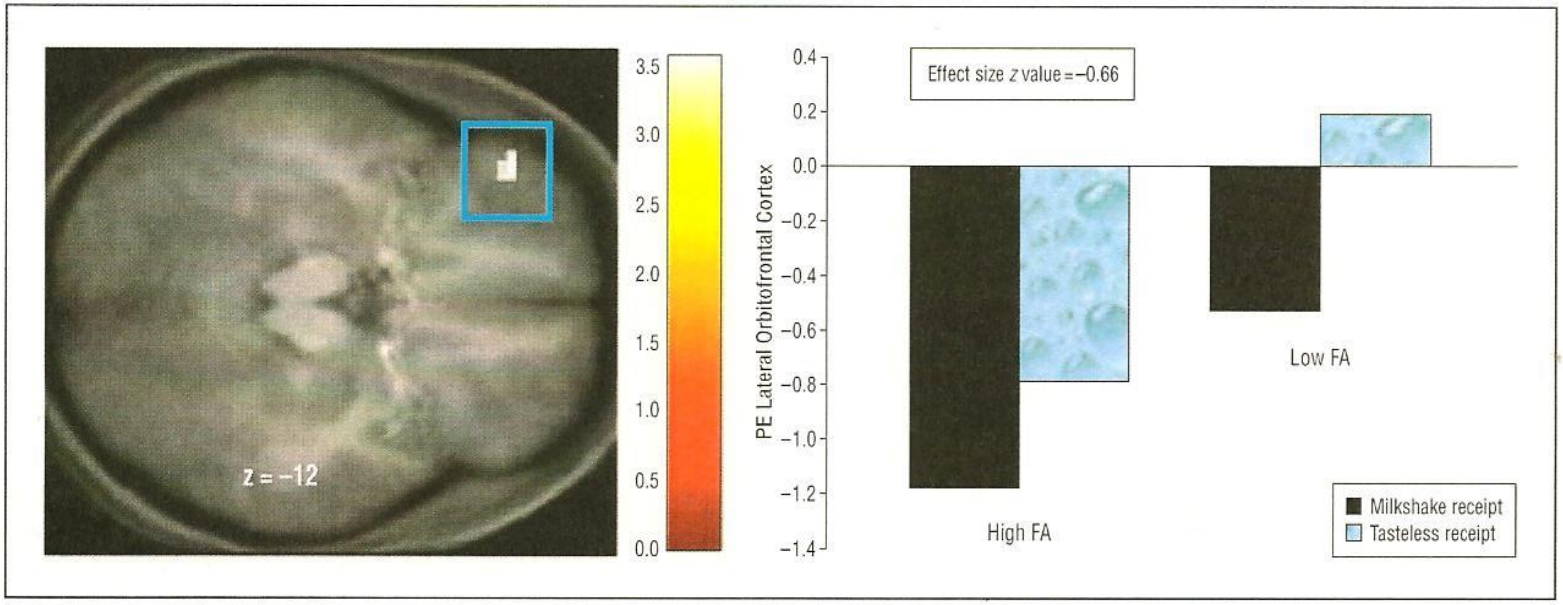

Figure 6. Activation in a region of the lateral orbitofrontal cortex (Talairach coordinates x, y, z: −42, 42, −12; z=−3.45; false discovery rate–corrected P=.009) during consummatory reward (milkshake receipt vs tasteless solution receipt) in the high food addiction (FA) group vs the low FA group, with the bar graphs of parameter estimates (PE) from that peak.

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Gearhardt, AN, et. al. 2011. Neural correlates of Food Addiction. Arch Gen Psychiatry. 321-329

Brain Circuitry: Prefrontal Cortex

- Reduced baseline activity of several regions of frontal cortex, as inferred from brain imaging studies in substance abuse and eating disorders
- Clinical manifestations of brain changes in prefrontal cortex:
  - Problems with working memory, attention and behavioral inhibition
  - Impulsivity (acting on sudden urges)
  - Compulsivity (driven by irresistible inner forces)
  - Frame shifting difficulties (stubborn thinkers)
  - Reward saliency (short versus long term)

AN Food Choice

- Fronto-striatal activity different by fMRI for those with AN when making maladaptive food choices
- Increased dorsal striatal activity compared to healthy controls
- Dorsal striatum involved in expression of learned automatic behaviors
- Adds to evidence base of fronto-striatal abnormalities in persistent maladaptive behaviors (also seen in addiction)

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Foerde, K., Steinglass, J., Shohamy, D., Walsh, B.T. *Nature Neuroscience.* 18 (11): 1571-1573 (2015).

AN and Reward

- Food restriction increases reward sensitivity
- Body weight and reward threshold directly correlated (also true with drug reward)
- Increase in stress prior to learned behavior shown to be associated with dependence on stimulus-response habits (initially rewarding behaviors become persistent)

Study of Compulsivity in AN

- Qualitative study examined parallels between AN and SUD
- Questionnaire given to 40 patients with AN
- 8 themes: compulsivity a core feature, impaired control, emotional triggers, compulsivity increases over time, negative consequences, persistence of behavior, impaired functioning, and role in recovery
- Themes parallel DSM V SUD criteria

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Frontiers in Psychology, Oct. 2015, Vol. 6, Article 1608.

Treatment Implications

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New Interventions

- Targetting reward processing and habit formation
- DBS
- rTMS
- Habit reversal techniques
  - Cognitive remediation therapy (CRP)
  - Exposure response therapy (ERT)
- Pharmacologic treatments targeting DA, opioid or GABA circuits

12 Step Facilitation for EDs

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Differences from SUDs

- Definition of abstinence requires a high level of clinical sophistication—we all need to eat
- Individualized and flexible definition of abstinence from ED behaviors
- Individualized boundaries around food behaviors, food types, meal plans
- Body image distortions more extreme
- More of an impact of media/culture of development of eating disorders
- Greater female to male prevalence ratio for ED than SA

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Differences, cont.

- Less recognition of EDs as brain diseases with genetic and biochemical components.
- More denial around impairment on social, emotional, cognitive and spiritual functioning of patients with active eating disorders
- Different physical signs and symptoms (but multi-organ impairments nonetheless)
- Less availability of 12 step support groups for ED

12 Step Myths

- It doesn't work for eating disorders because people can't abstain from food/eating
- OA is only for overeaters
- OA members aren't supposed to eat sugar/white flour
- It's religious
- Members are forced to stay in a position of powerlessness
- Members cannot trust themselves
- Members are discouraged from having therapists, doctors, and other sources of support
- Members are discouraged from taking medications

Tools of Recovery

- Literature:
  - 12 Steps and 12 Traditions of OA, Anorexics and Bulimics Anonymous, daily meditation books (i.e. For Today, Voices of Recovery)
- Meetings (recovery community)
- Sponsorship (help with working the steps)
- Service (helping others)
- Anonymity (humility—being “right-sized”)
- Writing/journaling
- Phone calls (peer support)
- Plan of Eating/Definition of Abstinence (individualized)

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Defining Abstinence

Abstinence means waking up every day and dedicating myself to recovery– to taking care of my body, mind, and soul.

For my body, abstinence is avoiding toxic substances and eating nutritious foods to fuel my body in a healthy way.

For my mind, abstinence means actively censoring my thoughts and effectively using my coping skills to manage stress and relieve anxiety.

For my soul, abstinence means truly being happy. It means that I make decisions that are consistent with my morals and values and take full responsibility for my own choices.

--TK alumnae

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Treatment

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Treatment

- Medical stabilization
- Education
- Family Therapy and Support
- Nutrition Therapy
- Individual and group therapy
- DBT and 12 step facilitation
- Expressive/Somatic/Movement Therapies
- Fitness plan
- Trauma work—compassion, structure, consistency, connection

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Treatment: physical

- Harm reduction: acute stabilization with eventual goal of abstinence from all ED behaviors and cognitions
- Medical complications (cardiac and suicide are most common cause for death)
- Food as medicine: refeeding
- “Normalization” of eating: a long process
- Body image/cognitive distortions: HAES

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Medical comorbidities

- AN: hypotension and low heart rate, heart arrhythmias, pancreatitis, decreased brain volume, kidney failure, amenorrhea, hepatitis, osteoporosis, anemia, constipation, seizures, death
- BN: any of the above plus esophagitis, Barrett's esophagus, hernias, salivary gland swelling, tooth erosion, gastric rupture
- BED: heart disease, congestive heart failure, arthritis, hernias, diabetes, high blood pressure, high cholesterol

Medication Management

- Most effective medication for a person with ED is…????
- FDA approved medications for AN
  - None
  - Evidence base shows none effective for weight gain
  - SSRIs can be effective in depression and anxiety disorders if present
  - Atypical antipsychotics shown to be effective in eating related obsessions/compulsions

Medications for BN and BED

- BN:
  - SSRIs Prozac and Zoloft shown to decrease binge/purge frequency and urges
  - Naltrexone in high dose (200-300mg) shown to reduce frequency of BN symptoms
  - Topamax efficacious in randomized trials for reducing uncontrolled eating, body dissatisfaction, dieting, food preoccupation, and anxious mood in BN

Medications for BN and BED

- BED:
  - BED with obesity or overweight, bupropion may cause mild weight loss and chromium may improve glucose regulation.
  - Another RCT suggests intranasal naloxone may decrease time spent binge eating
  - Vyvance shown in RCTs to reduce binge frequency

Medication contraindications:

- Anorexigenic agents:
  - stimulants (Adderall, Ritalin, Concerta)
  - topirimate
- Buproprion (Wellbutrin) contraindicated in patients with ED
- Agents which prolong QTc (Geodon, Mellaril, Thorazine)
- Laxatives/G-tubes
- BNZ in patients with or w/o co-occurring substance abuse
- OCP have not been shown to improve long term outcomes in randomized, controlled studies of amenorrheic patients with AN

Summary

- Addictions and eating disorders are in part brain diseases—progressive and potentially fatal.
- Clinical similarities between substance and behavioral addictions include common underlying cognitive, emotional, relational, and spiritual problems.
- There appear to be similar biological brain pathways associated with addictive food behaviors and substance addictions.
- New treatment approaches for ED may be borrowed from the SUD and OCD fields
- Ongoing peer support in the form of 12-step participation may increase the likelihood of long-term recovery for those ED

Questions???

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