



Behavioral Addictions



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Disclosures

- **Research Grants from: NIDA, Biohaven and Janssen Pharmaceuticals**
- **Off-label use of medications for behavioral addictions**

Objectives

- **To understand behavioral addictions and their characteristics**
- **Be aware of the developmental/neurobiological/cognitive underpinnings of behavioral addictions**
- **To examine the evidence for treatment of behavioral addictions**

Behavioral Addictions

- Gambling
- Gaming
- Stealing
- Sexual behavior
- Shopping
- Fire-setting
- Internet use
- Overeating
- ???

Core Features of Behavioral Addictions

Repetitive or compulsive engagement in a behavior despite adverse consequences

Diminished control over the problematic behavior

An appetitive urge or craving state prior to engagement in the problematic behavior

A hedonic quality during the performance of the problematic behavior

Common Core Qualities of Behavioral Addictions

- Tolerance
- Withdrawal
- Repeated unsuccessful attempts to cut back or stop
- Impairment in major areas of life functioning

Public Health Significance

Societal impact of gambling

For every \$46USD of gambling revenue generated, \$234 in societal costs are incurred –

\$5 billion burden overall

Sports Betting Online

- US Supreme Court decision *Murphy v National Collegiate Athletic Association* - allowed states beyond Nevada to legalize sports betting, including online wagers.
- Sportsbooks (physical or online places where individuals can place wagers on the outcomes of sporting events) have expanded from a single state to 38 states, with wagers increasing from \$4.9 billion in 2017 to **\$121.1 billion in 2023**
- There has been a 23% increase in searches nationally for gambling addiction help-seeking after *Murphy*.

Gaming and Gambling

- Since 1990s- interest in whether there might be a connection between video gaming and gambling.
- Two activities share much in common at structural level.
- Recent technological developments have led to some video games resembling, promoting, or intersecting with gambling products or facilitating continuous in-game purchasing to obtain random rewards.

Gaming and Gambling

- 54% of games on Facebook include gambling themes.
- 2018 review of 22 popular video games found that 5 retail games met the conventional criteria for gambling, including the option to cash out winnings.
- A study of young adults reported 94% of gamblers played video games & 55% of video gamers gambled

Factors predicting who gambles after gaming

- Impulsivity
- Risk-taking propensity

King A, et al. Issues Ment Health Nurs. 2020 Dec;41(12):1063-1075.

Screening for Co-Occurring Disorders

- Addiction Severity Index (ASI)
- Adult ADHD Self-Report Scale (ASRS-v1.1)
- Alcohol Use Disorder Identification Test (AUDIT)
- Drug Use Disorder Identification Test (DUDIT)
- Beck Depression / Anxiety Inventory (BDI / BAI)
- Personal Health Questionnaire (PHQ-4)
- Suicidal Behavior Questionnaire-Revised (SBQ-R)

Developmental Biology

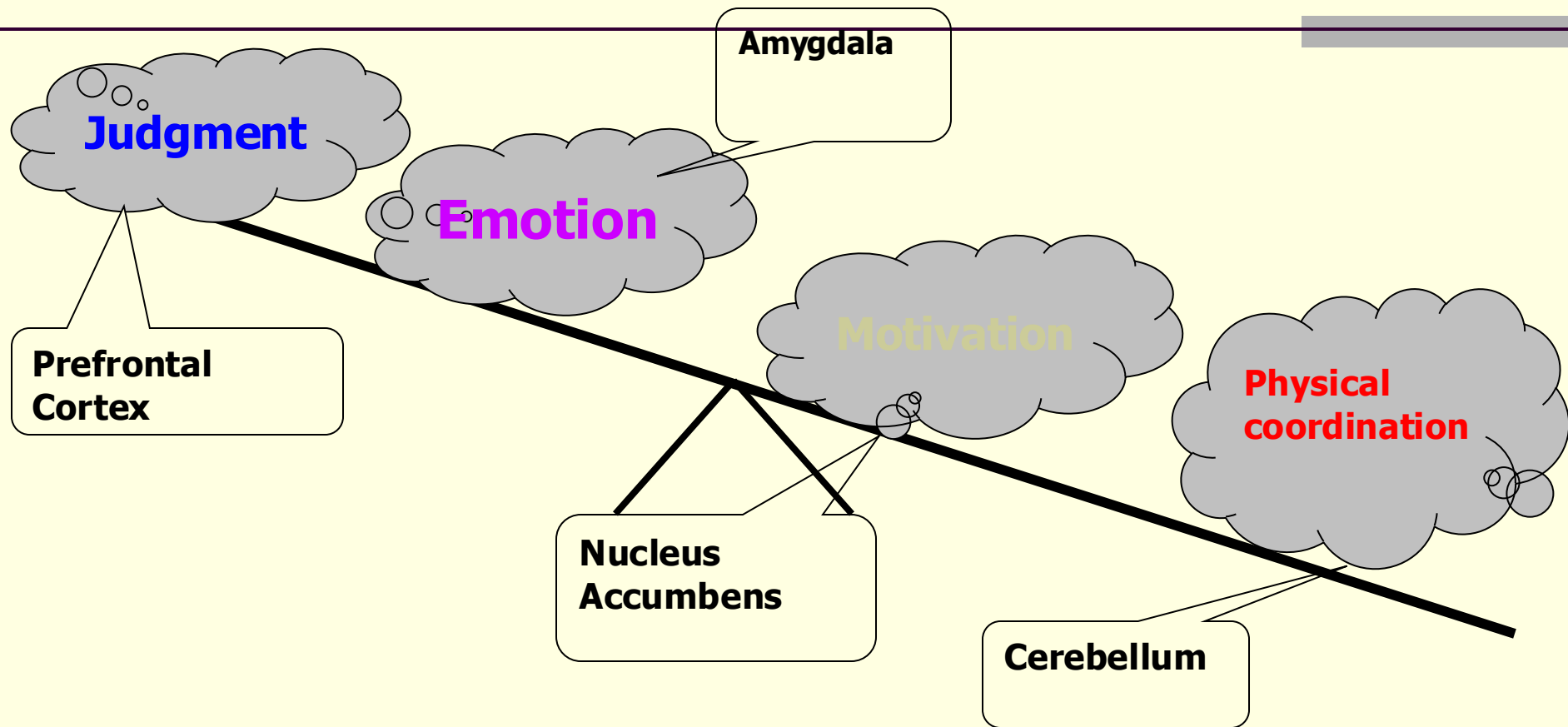
- Behavioral addictions generally start in young adulthood.
- Environmental and genetic influences - vulnerability to and expression of addictive disorders
- Changes in brain structure and function during adolescence might influence the motivation to engage in risk-taking behaviors.

Brain Development

- During late childhood, neurons increase their number of connections.
- But around 11 – GIRLS; 12½ - BOYS:
 - Some of these connections are pruned off.

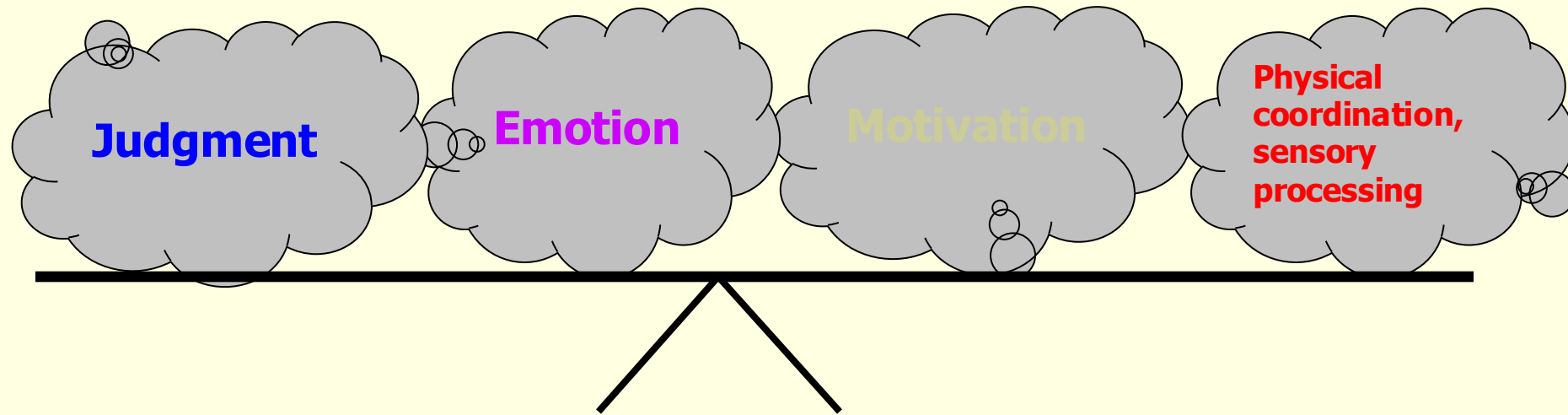
Development

- When the pruning is complete, the brain is faster and more efficient.
- **But...** during the pruning process, the brain is not functioning at full capacity



Notice: Judgment is last to develop!

Age 24



Balance

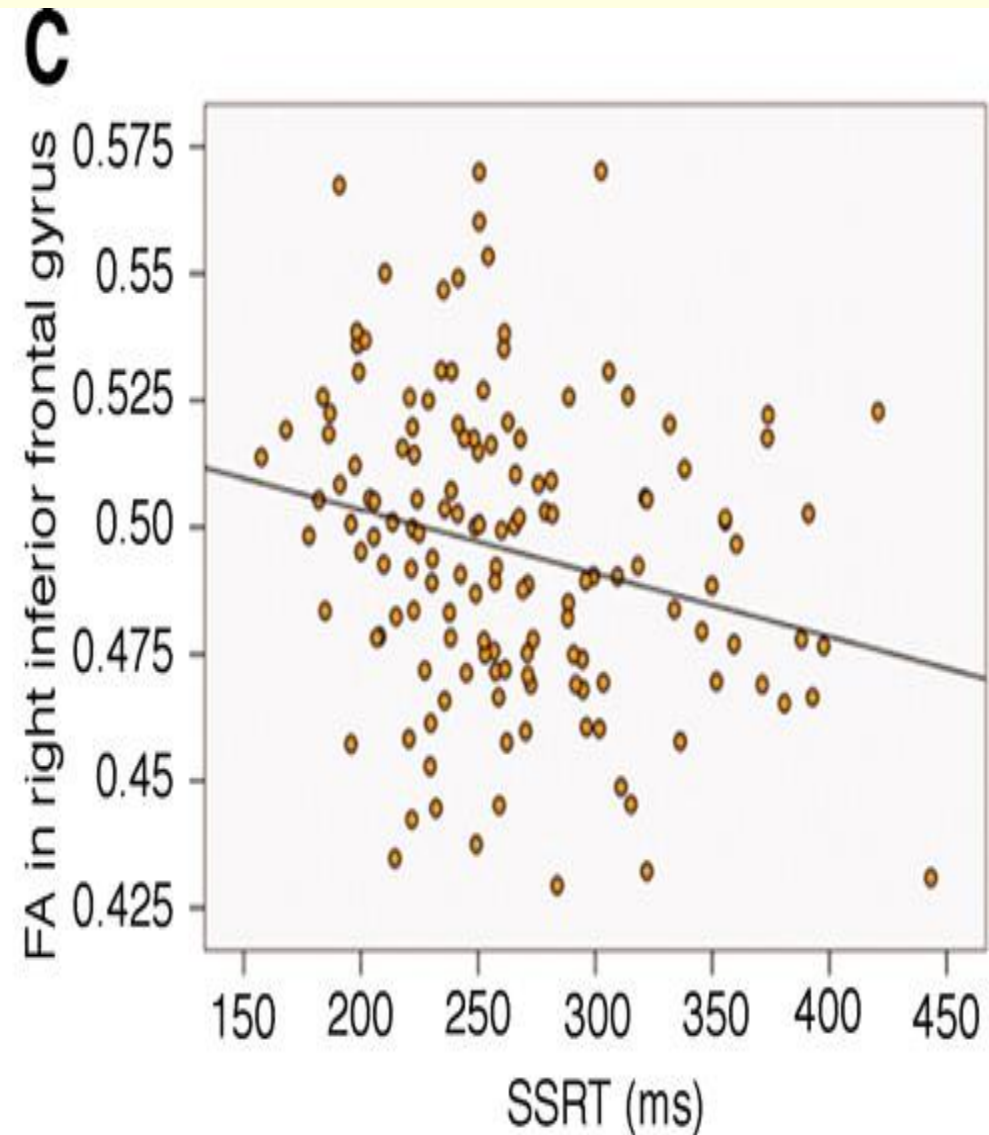
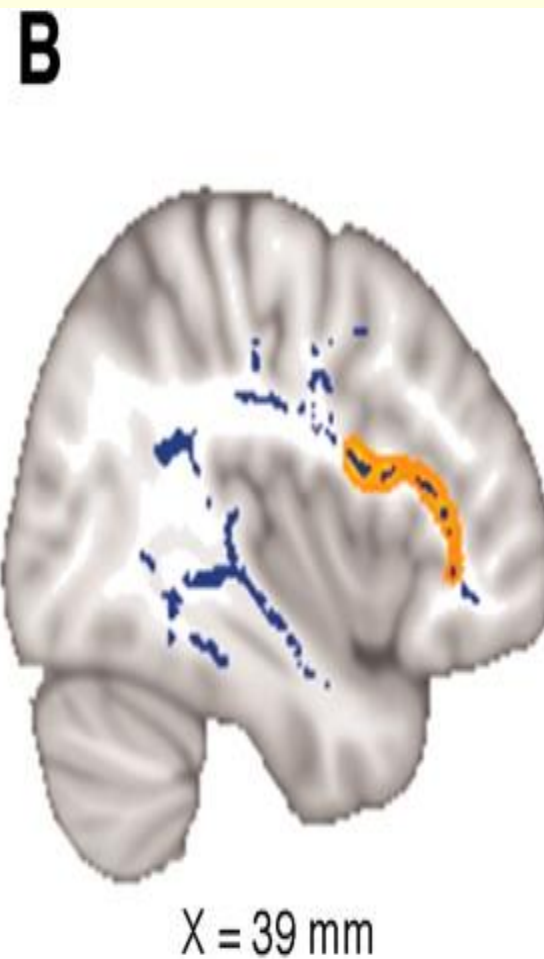
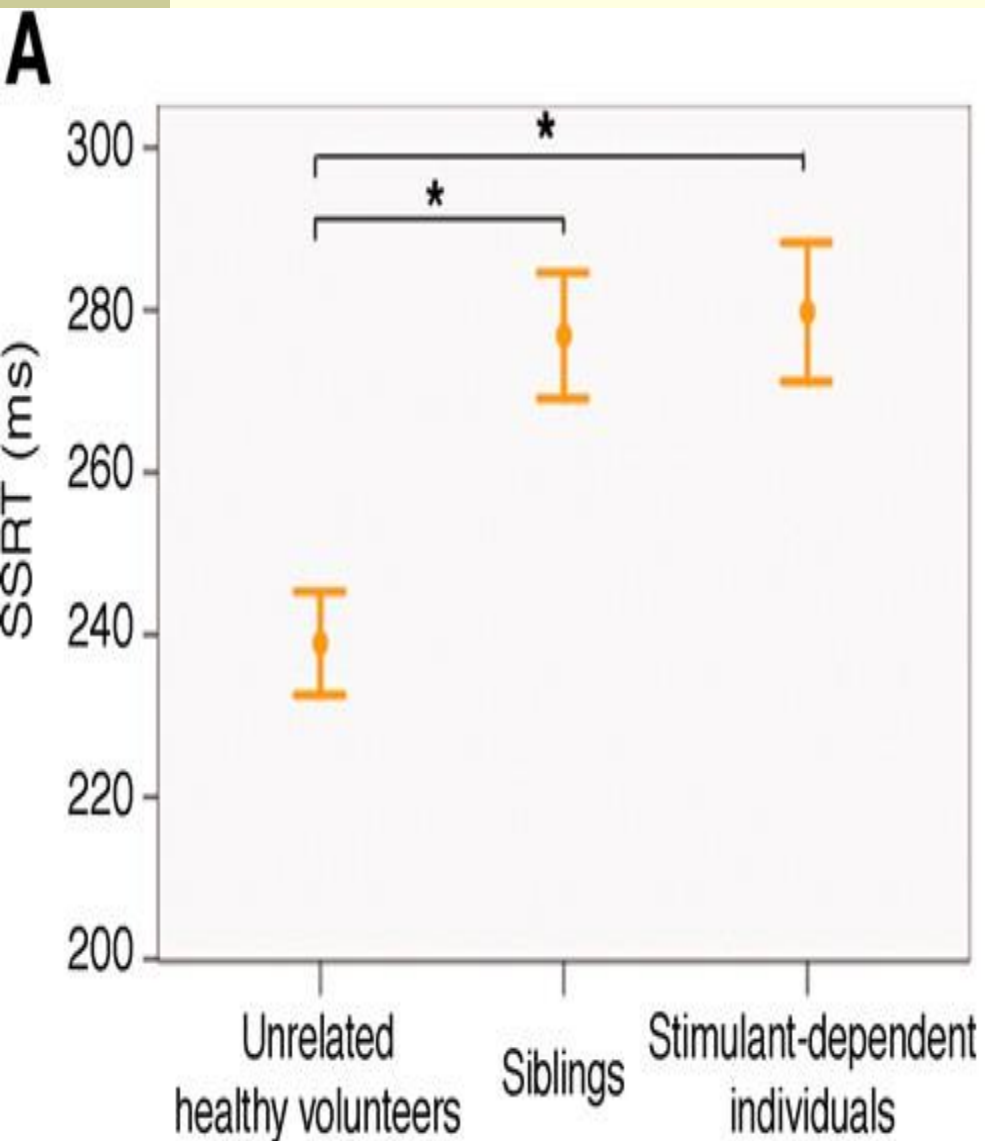
Youth Problem Behaviors



Neurocognition in Behavioral Addictions

- Impairments...
 - Cognitive flexibility
 - Impulsivity – risk/benefit assessment
 - Planning

Inhibitory Control - Familial

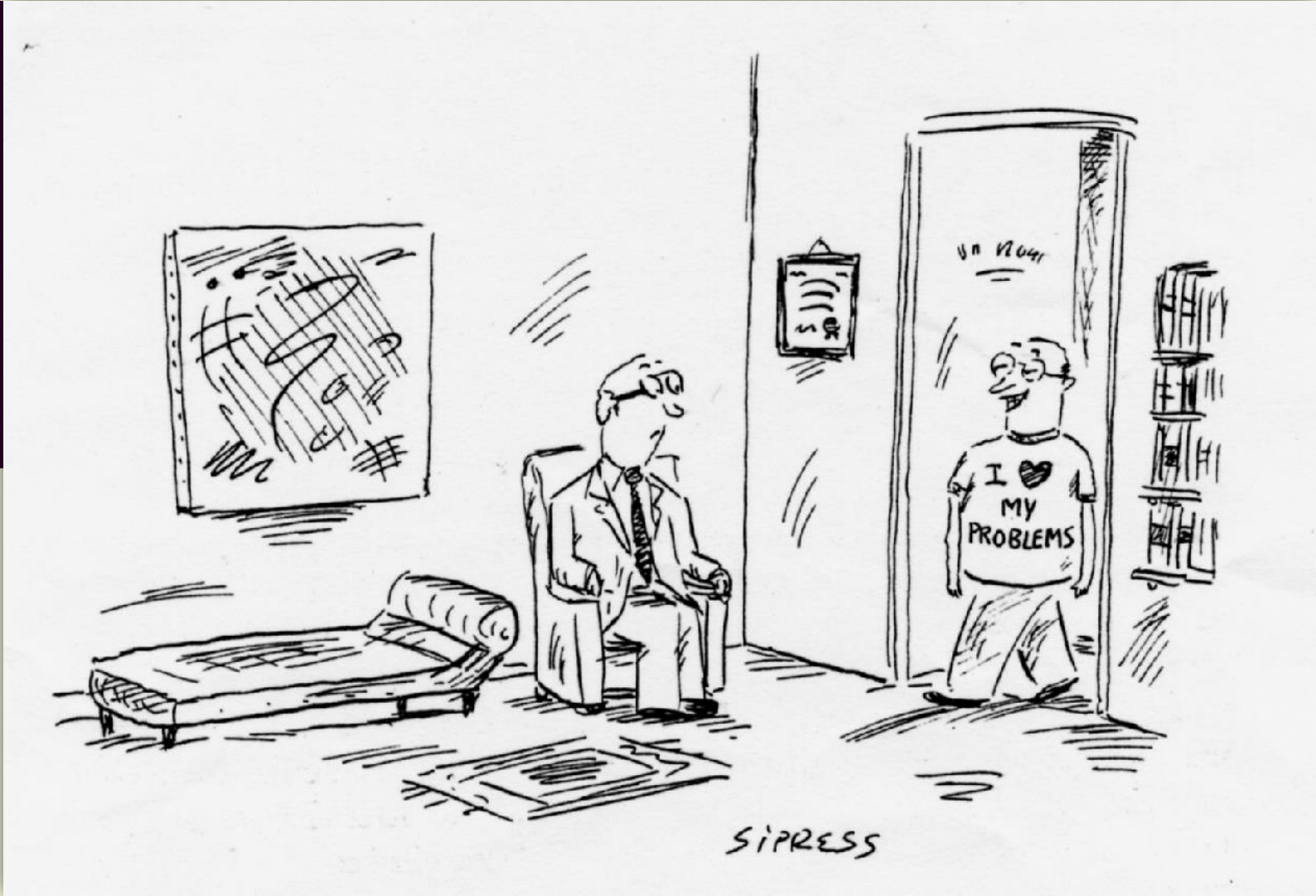


Brain Neurochemistry

- 5 main neurotransmitter systems contribute to the pathophysiology of behavioral addictions:
- Serotonin with respect to impulse control
- Dopamine with respect to reward-related behaviors,
- Norepinephrine with respect to arousal and excitement, and
- Opioids with respect to motivations and urges
- Glutamate – both top-down control and reward.

Dopamine and Behavioral Addictions in Parkinson's

- **Alcohol, gambling, sex, spending - Reported in Association with Parkinson's Disease**
- **Association Linked to Dopamine Agonist Treatment**
- **Prior impulse behavior and family history of addiction**



12-Step Programs

- Gamblers Anonymous
- Sexaholics Anonymous
- Shoplifters Anonymous
- Shoppers Anonymous

Current Status of Treatment

- No standard-of-care
- <6% of with gambling problem seek treatment
- Relapse for Gambler's Anonymous at 12-months ~94%

Treatment for Behavioral Addictions

- Pharmacotherapy
 - No medication FDA-approved for Behavioral Addictions
- Cognitive-Behavioral Therapy (CBT)
 - Length of treatment unknown; brief interventions have shown benefit
 - Multiple versions of CBT have shown benefit

Psychosocial Treatments

- Motivational enhancement
- Cognitive Behavioral Therapy
 - social skills, assertiveness training, anger management, cognitive restructuring, behavioral interventions, coping skills
- Imaginal exposure
- Contingency management
- Brief interventions

Can be done in individual or group formats

A

Thoughts/
Feelings

B

C

Antecedent
(Triggers)

Behavior

Consequence

Particular people

Environment

Feelings

e.g., urges,
argument with
spouse,
boredom, anxiety

Gambling/alternate behavior

e.g., I drove by the bar, next
think I knew it was last call

Abstinence

e.g., I thought about the effect
it would have on my family,
and took a different route
home

Positive

e.g., I gambled and I
forgot about that argument
with my wife

Negative

e.g., the next day, I felt
like I'm a failure.

Imaginal Exposure

“It’s Friday and I have been looking forward to gambling all week. As I am thinking about gambling right now, my urge = 75. Work has been quite stressful and it will feel good to escape for a while and have some fun at the casino. I am bringing \$200 and I have to leave the casino when that is gone, maybe 2-3 hours. I hope the money can last a little while so I don’t have to leave so soon. I notice my heart flutter slightly, have butterflies in my stomach, and I can hardly wait to get there. I am hoping my favorite machine is available and the traffic on the way to the casino is not too bad.”

Motivation to Quit Gambling

1) <u>Positive</u> aspects of impulsive behavior (what are the positive things behavioral addiction gives me?)	2) <u>Negative</u> aspects of quitting (what do I lose if I stop behavioral addiction?)
3) What are the <u>negative</u> consequences of behavioral addiction (current and future?)	4) What are the <u>advantages</u> of quitting behavioral addiction (what do I have to gain?)

Contingency Management

- Re-arranging the reinforcers in a person's environment
- Incentives or rewards to encourage specific behaviors
 - Vouchers, group acknowledgements, family prizes

Brief Interventions/Self-Directed Interventions

- Use CBT principles and apply them to workbooks or online programs
- Workbooks: self-assessment, goal setting, goal implementation, and goal maintenance
- Significant reductions in gambling frequency and severity
- Drop-out rates are higher than for professional face-to-face interventions

Pharmacotherapies

Several medications may/may not offer benefits over placebo:

- **Antidepressants**

SSRIs, bupropion - beneficial for gaming disorder; only partially helpful in gambling disorder and compulsive sexual behavior

Not helpful for kleptomania or compulsive shopping

- **Atypical antipsychotics**

Not helpful for gambling disorder; in some cases, may worsen behavioral addictions such as sex or gambling

Pharmacotherapies

Several medications may/may not offer benefits over placebo:

- **Anti-epileptics**

Topiramate - beneficial for gaming disorder; only partially helpful in gambling disorder

- **Stimulants**

Methylphenidate – beneficial for gaming disorder; in some cases may worsen behavioral addictions such as sex or gambling

Pharmacotherapies

Some medications appear to more consistently offer benefits over placebo:

- **Opioid antagonists**

Naltrexone - beneficial for gambling disorder and kleptomania; in uncontrolled studies also beneficial for gaming disorder, compulsive sexual behavior, and compulsive buying

- **N-acetyl cysteine**

Beneficial for gambling disorder; in uncontrolled studies also beneficial for gaming disorder, compulsive sexual behavior, and compulsive buying

- **Lithium**

Beneficial for gambling disorder

Pharmacotherapies

Some medications appear promising:

- **Memantine**

Beneficial in open-label studies for gambling disorder, kleptomania, and compulsive buying

- **Tolcapone**

Beneficial in open-label study for gambling disorder

Confounders to Treatment

Placebo response rates of up to 60+%

Is combination treatment better than single option?

Short-term studies

Unclear how much intervention someone needs

Heterogeneity within and between disorders

Clinical Subtyping

Comorbidity?
Neurocognition?
Genetics?
Imaging?

What about other treatments?

- Psychedelics?
- Brain stimulation?
- New drugs or therapies on the horizon?

QUESTIONS?



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