The WAGER, Vol. 22(12) – Mind or matter: Is gambling craving biologically based?

November 8, 2017

Cue reactivity refers to the craving a person with a substance use disorder feels when exposed to drug paraphernalia. Cue reactivity studies using functional magnetic resonance imaging (fMRI) have led to the incentive sensitization theory of addiction. This theory suggests that cue reactivity activates the reward pathways of the brain and that these regions are more reactive in people with substance use disorders. This week, The WAGER reviews a study by Eve Limbrick-Oldfield and her colleagues that explores cue reactivity in people with Gambling Disorder.

What is the research question?

Does exposure to gambling-related images increase cue reactivity among people with Gambling Disorder?

What did the researchers do?

The researchers recruited two groups of participants from London, England. To be included in this study, all participants were required to be male, between the ages of 25 and 60, and able to understand English. The Gambling Disorder group consisted of 20 people from the National Problem Gambling Clinic. Individuals in this group qualified for DSM-IV criteria for Pathological Gambling, received a score of greater than 8 on the Problem Gambling Severity Index, and abstained from gambling for at least 48 hours. The control group consisted of 22 people who volunteered after seeing advertisements in their community. The researchers assessed cue reactivity via self-reported and fMRI evidence of craving in response to gambling-related and neutral images(1).

What did they find?

Among Gambling Disorder group members, but not control group members, exposure to gambling-related images was associated with increased self-reported craving compared to exposure to neutral images. fMRI results, shown in Figure 1, indicate that when Gambling Disorder participants viewed gambling-related images compared to neutral images, they experienced more activity in a region of

the brain associated with reward-seeking behavior, the nucleus accumbens, and in its connection to parts of the brain associated with self-awareness of internal states, the insula and the superior frontal gyrus. The opposite effect was seen in the control group – they had more activity in these areas when seeing neutral cues. Further, the researchers found that when self-reported craving was high, activity along the connection between the nucleus accumbens and the medial prefrontal cortex – a region of the brain associated with self-regulation – was low.

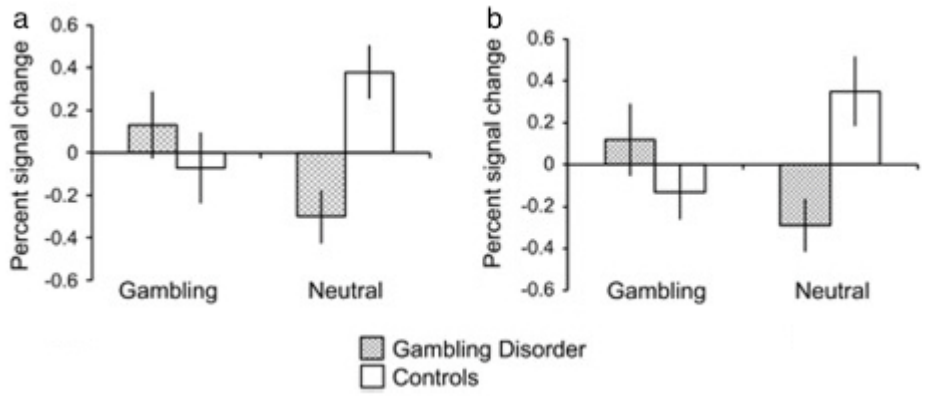

Figure. Each bar in the graph above represents a percentage of signal change between the nucleus accumbens and the left insula (a) as well as in its connection to the superior frontal gyrus (b) while participants viewed either gambling-related or neutral imagery. The grey, mesh bars represent participants in the Gambling Disorder group. The solid, white bars represent participants in the control group. Positive signal change indicates increased activity in the nucleus accumbens relative to the left insula as well as the superior frontal gyrus while negative signal change indicates lowered activity. This image was adapted from Limbrick-Oldfield et al. (2017) and has been reproduced under the Creative Commons Attribution 4.0 International License. Click image to enlarge.

Why do these findings matter?

People in the Gambling Disorder group experienced more craving in response to cue reactivity. Current DSM-5 criteria for Gambling Disorder do not specifically address craving. The closest criterion deals with preoccupation, when a person has persistent thoughts about gambling. In contrast, for substance use disorders, craving is one of the criteria for diagnosis. The absence of a craving criterion might lead to underdiagnosis of Gambling Disorder, which means that people who could use help might not get it until their problem is more severe. This is especially important for clinicians because prior gambling research has indicated that craving is both a predictor of relapse as well as of treatment compliance.

Every study has limitations. What were the limitations in this study?
When a person is expecting to speak with a psychologist about their gambling behavior, throughout the day they may think about what they want to talk about. Participants in the first group in this study were scanned by fMRI while awaiting psychological treatment for Gambling Disorder. Their demonstrated increase in cue reactivity might have been influenced by their anticipation to speak to a psychologist. Additionally, the use of a sample of people seeking treatment for Gambling Disorder, as well as the use of only men, may not accurately represent the full spectrum of people with Gambling Disorder.

For more information:
There's strength in reaching out. Call or text the National Problem Gambling Helpline at (800)522-4700 or chat with a counselor online.

— Pat Williams

What do you think? Please use the comment link below to provide feedback on this article.

---

(1) The researchers selected gambling-related images on the basis of the Gambling Disorder group members' preferred type of gambling (e.g., electronic roulette, sports betting, and slots machines). Preferences were matched for the control group in a 1:1 ratio. In other words, for every Gambling Disorder group member who preferred roulette and saw roulette images, one member of the control group was shown roulette images. Neutral images matched the style of the gambling-related images, but were unrelated to gambling (e.g., a picture of an open newspaper that looks like a picture of an open sports betting booklet).