

Introduction

Behavioral addictions demonstrate similar features to substance addictions in that they can lead to altered brain circuitry and response to treatment, an altered sense of risk, and be linked to certain comorbidities (Jacobus, Taylor & Gray, 2018; Stacy & Wiers, 2010; Hull, Brunelle, Prescott & Sargent, 2014).

Individuals with **problematic gaming habits** have an increased chance exhibiting altered social relationships, worsening academic or professional performance, lack of attention to basic personal needs, and an impaired perception of self (Király, Nagygyörgy, Griffiths, & Demetrovics, 2014; Männikkö, Billieux, & Käriäinen, 2015, Jacobs Df, 2986; Kim & Hodgins 2018).

Those demonstrating behavioral addiction tend to have certain **cognitive biases**, including an impulse to approach rather than avoid addiction-related stimuli (Field et. al., 2008). The extent of this approach bias can be measured using a task known as the approach-avoidance task.

The purpose of this experiment is to examine *whether the approach bias effect can be observed in undergraduates demonstrating problematic gaming habits*. We also wanted to investigate whether there is a link between frequent video game use and various health/lifestyle afflictions including social media addiction, pornography use, depression, anhedonia and overall quality of life

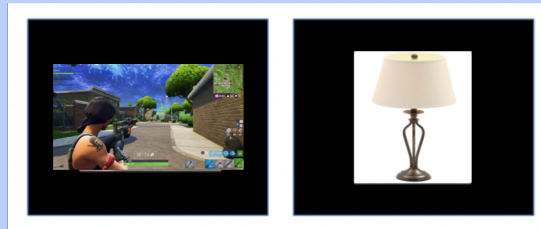
Method

Participants: 129 students from the University of Connecticut with varying levels of video game usage, as determined by the Problematic Online Gaming questionnaire (POGQ), were recruited to participate in the study. The POGQ is an 18-item questionnaire that quantifies problematic gaming via six dimensions: preoccupation, overuse, immersion, social isolation, interpersonal conflicts, and withdrawal (Demetrovics, Urbán & Nagygyörgy, 2012)

Materials : Participants filled out additional questionnaires that measured problematic videogame and internet gaming habits including the Internet Gaming Disorder Test (IGDT), Bergen Social Media Addiction Scale (BSMAS), and the Motives for Online Gaming Questionnaire (MOG Q). Problematic cannabis use, pornography use, depression, anhedonia, and quality of life were also assessed.

Approach Bias Task

Participants were instructed to **push** or **pull** a standard joystick in response to a property of an image unrelated to its content, in this case the orientation of the image (e.g., horizontal vs. vertical) (Wiers et. al., 2011)

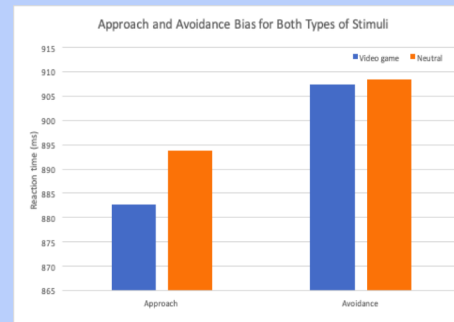


Movement of the joystick caused the image to enlarge and fill the screen (**approach**) over an interval of 1 s when pulled, and shrink continuously (**avoidance**) over a 1 s interval when pushed. Quick and accurate response times were encouraged throughout the two separate tests, totaling 100 trials. 20 practice trials preceded the first test followed by 50 cannabis and 50 neutral images, in no particular order.

Results

- Cognitive bias is calculated using the following:

$$[(\text{Video Game push RT} - \text{Video game pull RT}) - (\text{neutral push RT} - \text{neutral pull RT})]$$



- There was a significant approach bias for the video game images compared to the neutral images ($p < 0.05$).
- However, there was no avoidance bias for the video game images compared to the neutral images ($p = 0.87$).

Results

- Approach bias score has a significant positive correlation with pornography use (PPUS / approach bias score, $r = 0.23$, $p = 0.003$)
- There were no other significant correlations with the bias measures.
- Observed highly significant positive correlations between the POGQ and the IGDT, a significant positive correlation between the POGQ and the PPUS, a significant positive correlation between the POGQ and the R-SAS, and a significant negative correlation between the POGQ and the QOLS (Table 1).

CORRELATION TABLE	POGQ
R-SAS	$r = 0.21$, $p < 0.05$
Problematic Pornography Use Scale (PPUS)	$r = 0.59$, $p < 0.001$
Internet Gaming Disorder Test (IGDT)	$r = 0.90$, $p < 0.001$
Quality of Life Scale (QOLS)	$r = -0.23$, $p < 0.01$

Conclusions

- We observed that an increase in frequency and severity of video game use was correlated with an increase in gaming, pornography use, and social anhedonia, as well as a reduced quality of life.
- However, while there was an overall approach bias among participants, those who met the criteria for problematic gaming (scoring above a 32 on the POGQ cut-off scale) did *not* demonstrate a stronger approach bias for video game stimuli; these results contradict previous findings involving substance addictions like tobacco, alcohol, and cannabis, as well as behavioral addictions like pornography use.
- Interestingly, a stronger approach bias in this context was associated with increased pornography use.
- Warrants further research on the role of gender and video game type (specifically, MMORPG) on severity of problematic gaming and consequent cognitive biases.

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