

# Assessing attentional bias for alcohol-related cues using eye tracking in a virtual reality environment

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## Introduction

Attentional biases (AB) for substance-related cues (i.e., implicit changes in attentional resource allocation) are thought to guide addictive behavior and contribute to the development and persistence of alcohol use disorders (1,2). While most studies investigate AB using attentional tasks, sometimes coupled with eye-tracking devices (3), the presentation of single pairs of stimuli or relatively complex patterns of stimuli cannot be considered an adequate reflection of the complexity of real-life substance use situations (4). To address this shortcoming, we integrated an eye-tracking system into a virtual reality (ET-VR) headset and measured attentional biases in a subclinical population of alcohol users.

## Objectives

The first purpose was to test whether it is possible to assess AB for alcohol-related cues using ET-VR. Attentional focus was assessed using the dwell time and the number of fixations for a set of previously identified stimuli. We hypothesized a positive correlation between AB measures for alcohol-related cues and level of alcohol craving and consumption (5,6).

## Methods

### Participants

N=40	
Gender (M:F)	20:20
Age (years)	26.2 (3.9)
Education (years)	14.7 (2.3)
AUDIT score	6.8 (4.7)

### Materials & procedure

#### 1. Screening (at home)



Demographic information  
Medical history  
**Drug use including AUDIT**  
Impulsivity (UPPS-P)

#### 2. Virtual reality (in the lab)



Free-viewing task in a virtual bar environment (2 blocks of 2 min.)

Eye-gaze was collected with Pupil Labs system© integrated into an HTC-Vive headset

Scan the QR-code for video example

#### 3. Post-experimental questionnaires



Sense of Presence  
Cybersickness  
Thoughts and compulsive drinking (OCDS)

## Results

### Bilateral Kendall's correlations between OCDS, AUDIT and the number of fixations for predefined alcohol-related items



### Bilateral Kendall's correlations between OCDS, AUDIT and the number of fixations for predefined neutral items



## Conclusions

Our data suggest that the total fixation time and the number of fixations associated with predefined alcohol-related cues show significant positive correlations with alcohol drinking motivation (obsessive thoughts and compulsive drinking) in the past seven days and to a lesser extent with the individual alcohol consumption trends. In contrast, no such relationships were found for neutral stimuli, indicating the specificity of the observed correlations. In conclusion, the present study shows that alcohol-induced attentional biases can be successfully studied using an ET-VR device in a subclinical population of alcohol users.

## References

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