Title

Substance Cue Exposure in Virtual Reality: Task Development and Early Results

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Substance Cue Exposure in Virtual Reality: Task Development and Early Results

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INTRODUCTION

- Craving predicts substance use in laboratory studies[1] and is a common treatment target[2]
- Virtual reality (VR) paradigms elicit stronger craving than traditional picture-cue methods[3]
- Reliable objective correlates of craving would benefit the investigation of the psychobiologic foundations and clinical consequences of craving
  - Attentional bias: The ability of drug cues to capture the attention of the user

Present Study Aim

- To develop novel, translatable VR paradigms to induce and assess alcohol and nicotine craving via cues and measurement of craving correlates

METHODS

VR Paradigm Scenes

- Active (include substance cues)
  - Alcohol: Living room party
  - Nicotine: Bar patio, outdoor BBQ
- Control (no substance cues)
  - Alcohol: Library
  - Nicotine: Library, waiting room
- Scene order: Control, Active…

****Two nicotine scenes omitted due to design difficulties (driving and bus ride)***

Real-Time Measurements

- Attentional bias: Mean active vs. neutral cue eye-gaze

Self-Report/Interview Measures

- Substance Use: Customary Drinking and Drug Use Record, Timeline Follow-Back, Alcohol and Tobacco Craving Questionnaires
- Subjective Assessment: VAS (0-100%) between scenes
  - "How much are you craving alcohol/nicotine right now?"
  - "How relevant was that scene to your own life?"
- VR-Related: Igroup Presence Questionnaire (IPQ, Range: 1 - 7), Simulator Sickness Questionnaire (SSQ, Range: 0 – 78.54)

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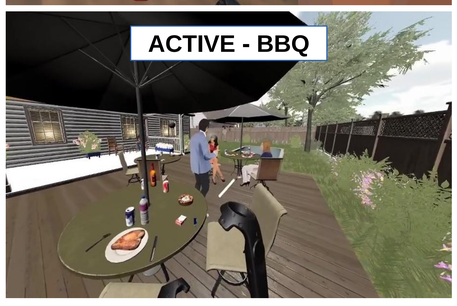
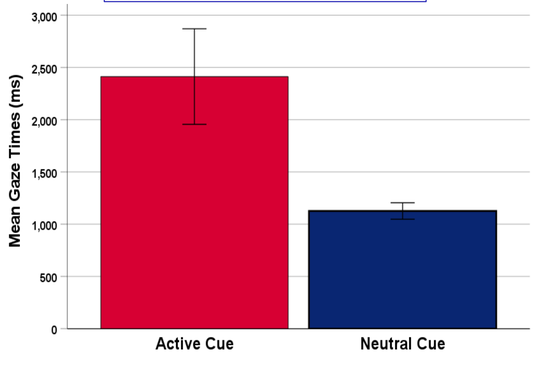
VR Alcohol Cues Paradigm

VR Nicotine Cues Paradigm



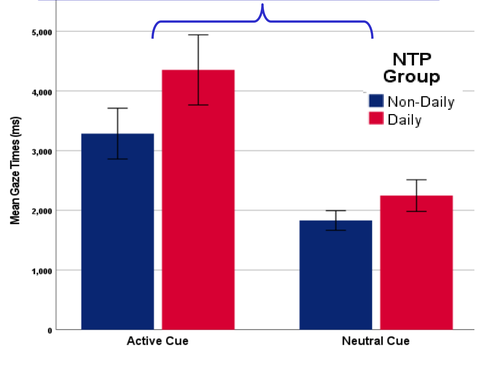
Alcohol Paradigm

$t(12) = 2.73$, $p < .05$, $d = .76$



Nicotine Paradigm

$F(1,27) = 23.53$, $p < .001$; $\eta p^2 = .47$



RESULTS

Demographics			
	Alcohol Sample	Nicotine Sample	
		Non-Daily	Daily
N	15	17	14
Age in years	21.67 (3.40)	24.41 (8.60)	38.50 (20.17)
Sex - % Male	53%	52.9%	71.4%
Race/Ethnicity - % White	60%	52.9%	71.4%
Sense of presence (IPQ)	50.00 (15.60)	59.89 (8.05)	60.18 (12.11)
Simulator sickness (SSQ)	10.22 (12.36)	21.08 (14.39)	9.94 (10.83)

Alcohol Results

- Heavy drinkers: drinks per drinking day M =4.94, SD = 2.82; drinking days per month M =10.10; SD =4.03
- Active scene (M = 18.85) elicited > subjective craving than control scene (M = 7.74); $p = .05$; d = .59
- Attentional bias towards active cues correlates with subjective craving (r(13) = .51, $p = .07$)

Nicotine Results

- Non-Daily: 90-day nicotine use episodes M = 127.12, SD = 139.91; 90-day nicotine use days M =35.88, SD = 26.64
- Daily: 90-day nicotine use episodes M = 1555.71, SD = 1056.56; 90-day nicotine use days M =89.50, SD = 1.23
- Attentional bias > in daily users (M = 3300.27) than non-daily users (M =2558.35); $p = .08$, $\eta p^2 = .11$
- Active scene (M = 39.75) elicited > subjective craving than control scene (M = 30.31); $p = .008$, $\eta p^2 = .32$
- Daily users (M= 48.38) reported > subjective craving for both conditions than non-daily users (M = 21.67); $p = .04$, $\eta p^2 = .21$

FUTURE DIRECTIONS

- These novel VR paradigms may serve as an ecologically valid method of inducing and assessing alcohol and nicotine craving and attentional bias
- Indices for future analyses: spontaneous eye-blink rate, orienting bias (first fixation cue type), break frequencies (attempts to look at other cues following active cue engagement), and pupil dilation

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