Cue-elicited craving for food in virtual reality

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1. Introduction

This study explores the use of virtual reality technology as an alternative to in vivo exposure in cue-exposure therapy for bingeing behavior, and assesses the ability of different virtual environments to elicit craving for food in a non-clinical sample. Previous research has indicated that craving for food can be elicited by exposure to food cues [Ferriday and Brunstrom 2011; Sobik, Hutchinson and Craighead 2005]. Given that craving for food is considered a trigger of bingeing, cue-exposure therapy with response prevention of bingeing may be effective in extinguishing the craving response in patients with eating disorders and obesity. However, the application of the in vivo cue exposure technique in the therapist's office faces logistical difficulties and is hampered by a lack of ecological validity [Koskina, Campbell and Schmidt 2013]. The use of Virtual reality (VR) technology may overcome the difficulties described. Nevertheless, before VR-based cue-exposure can be used for therapeutic purposes, the ability of VR scenarios to elicit craving responses in participants must be assessed. This is the objective of the present study.

2. Methods

Sixty-six women and 15 men participated in the study. After giving written consent, participants were administered the Eating Attitudes Test-26 (EAT-26) and were then exposed in random order to four non-interactive virtual environments: the low-calorie kitchen (Food cues: salad and apple), the high-calorie kitchen (Food cues: pizza and ice-cream), the low-calorie restaurant (Food cues: salad and apple), and the high-calorie restaurant (Food cues: pizza and ice-cream). After two minutes of exposure, craving for food was measured using a visual analogue scale (0-100). Virtual environments were displayed by means of a stereoscopic laptop.

3. Results

Mixed between-within analyses of covariance 4 (VR scenario) x 2 (gender) were conducted to assess craving differences depending on the exposure situation. Since males and females showed significant differences in EAT-26 scores (t[79]= 3.52; p=.001; η^2= .135), gender differences were considered. Time elapsed since the last meal was introduced as a covariate to control cue responses produced by food deprivation. No significant interactions between gender and situation were found, but the exposure situation had a significant effect on reported craving (F[3, 75]= 4.016; p=.010; η^2=.138). Craving for food was higher in the environments with high-calorie food than in the environments with low-calorie food, in both males and females.

4. Conclusions

The results show that exposure to virtual environments provokes changes in reported craving for food. High-calorie food cues elicit the highest levels of craving in both males and females. Cue exposure by means of VR is an effective procedure for eliciting craving for food and may therefore be useful for therapeutic purposes. As is the case in real situations, exposure to high-calorie food produces the highest levels of food craving.

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References

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