

5-29-2020

The Development of Virtual Reality as a Tool to Investigate Eating Behavior

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Abstract

Objectives: The objective of this study was to a) determine the feasibility of eating in virtual reality (VR) environment while wearing a head mounted display (HMD) and b) determine the effect of eating in a virtual restaurant on food intake, sensory evaluation of the test food and masticatory parameters.

Disciplines

Food Processing | Food Science | Human and Clinical Nutrition

Comments

This article is published as Hollis, J., Oliver, J., The Development of Virtual Reality as a Tool to Investigate Eating Behavior. *Current Developments in Nutrition*. 4(2) June 2020;1308, doi:[10.1093/cdn/nzaa059_025](https://doi.org/10.1093/cdn/nzaa059_025). Posted with permission.

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The Development of Virtual Reality as a Tool to Investigate Eating Behavior

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Objectives: The objective of this study was to a) determine the feasibility of eating in virtual reality (VR) environment while wearing a head mounted display (HMD) and b) determine the effect of eating in a virtual restaurant on food intake, sensory evaluation of the test food and masticatory parameters.

Methods: Fifteen adults were asked to report to the laboratory on two occasions, separated by at least one week, at their usual lunchtime. On reporting to the laboratory, surface electrodes were attached to the left and right masseter muscles to measure masticatory activity and a wristband placed on the non-dominant wrist to collect physiological data. The participant sat quietly for 5 minutes before a VR (HMD) was placed on their head. The HMD displayed either a virtual restaurant (pizzeria) or a blank scene (consisting of a white background and a table). The participant's hand movements were captured using an infrared camera mounted on the HMD so when the participant moved their hands this was represented by computer generated model hands

in the VR scene. The test foods (pizza bites) were represented in VR using a 3D model of pizza bites. The test foods were arranged so that when the participant touched the test food model in the VR scene they touched the test food in real life allowing them to locate and pick up the test food. The participant was instructed to eat the test food until they felt comfortably full. When the participant finished eating the equipment was removed and they completed questionnaires regarding their feelings of presence and experiences in the VR environment and their ratings of the test food attributes.

Results: Participants were able to successfully locate and eat the pizza rolls while in the VR environment. The participants feeling of presence was higher in the restaurant scene compared to the blank scene ($P < 0.05$). Heart rate and skin temperature were higher in the restaurant scene ($P < 0.05$). Differences in masticatory parameters were found with participants using fewer masticatory cycles before swallowing in the restaurant scene ($P < 0.05$). There were no differences between scenes regarding the sensory evaluation of the test foods. There was no difference in food intake between the treatments.

Conclusions: Eating in VR is feasible and may provide a new method to understand eating behavior in different contexts.

Funding Sources: None.