

Abstract

In the past few years, various studies have been exploring the effects of presence, or the feeling of actually being part of the environment, in virtual reality (VR) on empathy. This successful application of VR to charitable causes is determined by the multisensory nature of VR experiences, which enables reality-like perspective-taking and enhances empathy. One of these projects is “Being There”, a virtual museum that displays the Lamentos Escuchados settlement for migrant women, to raise empathy and funds to improve their living conditions. However, recently, many researchers have started to explore the possibility of further implementing these VR experiences with a niche yet fundamental feature, olfaction. Being a pivotal sense in human understanding, olfaction has been recognized to significantly enhance the sense of presence in environments. Unfortunately, despite many sources proving the value of odor in VR, this addition comes with few issues such as the costs, the trouble of delivering odors correctly and skepticism on the actual possibility of affecting presence. Therefore, this research’s main objective was to study the implementation of odors in the VR experience Being There, in order to analyze if presence can really be affected by answering the first research question:

How does the implementation of odors in a virtual environment affect the overall sense of presence?

Additionally, this research studied low-level, middle level and high-level of congruent visual-olfactory stimuli in order to determine through the second research question if (and to what extent) they can affect presence:

How is the sense of presence affected by concordant visual-olfactory stimuli?

Finally, the findings on presence were analyzed to determine whether they can, in their turn, influence the self-perceived empathy that users perceive towards migrant women. To do so the third, and final, research question was formulated:

How can the implementation of odor affect empathy towards migrant women in the VR project Being There?

Successively, to answer the three research questions a quasi-experimental design was selected, composed of a VR testing part and an in-depth semi-structured qualitative interview. The 21 participants were selected through random sampling, and divided into 4 groups based on the odor condition they were going to experience. After testing, each participant was interviewed on their political inclination, proneness to donate (prior and after testing), the perceived presence and empathy.

Consequently, it was determined that the addition of odors enhanced the sense of presence in the VR experience Being There. Besides, the superiority of highly congruent visual-olfactory stimuli was established, while still assessing effectiveness of low-congruent stimuli.

Successively, despite the correlation between presence and empathy in VR, the addition of odors didn't affect the overall perceived empathy. Nevertheless, physiological responses such as sighing and body language indicated the possibility of a latent effect still to be discovered. Finally, this study highlighted the future need to invest in devices that simplify the process of delivering odors, the need to uniform the level of detail in the current and ideal space, enhancing the level of congruency and studying physiological responses with the right devices.