

To The Moon and Back: A Study on The Overview Effect in the Virtual Reality Environment

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ABSTRACT

Numerous studies proved the ability of VR technology to elicit cognitive shift. The aim of this small-scale research was to investigate to what extent cognitive shift described as the overview effect can be evoked in the VR environment. The results of data from a one-factor repeated measures experimental design confirmed that significant differences in the attitude of participants occurred, when pre-test and post-test condition compared. The most impact was demonstrated in relation to perception of Earth and appreciation of life.

KEYWORDS

vr, virtual reality, overview effect, cognitive shift

1 INTRODUCTION

The overview effect phenomena, broadly described by astronauts as an experience of deep cognitive and spiritual inner shift, has become a subject of a scientific exploration only recently. Although the possibility of space traveling is currently available to less than 1 percent of our society, affective media such as virtual reality (VR) bring the idea of space tours closer to a wider public. Due to its rich visualization, immersion and interaction characteristics, VR is able to simulate realistic spatial environments. In light of the above-mentioned, it seems compelling to explore whether psychological effects of space traveling can be triggered in space simulated in a VR.

2 BACKGROUND

The manifestation of cognitive shifts described by astronauts corresponds closely with the concept of cognitive reframing - a shift in the conceptual standpoint which relates to a context within a situation is experienced [6]. The alternation of perspective that matches actual facts can result in a positive change of the meaning a person assigns to a particular situation, including ways of perceiving events and ideas [8]. In light of this, the experience of looking at Earth from space can be perceived as an alternative, broad perspective on human life and its day-to-day problems, as well as concerns regarding our planet. Various studies suggested that visual cues play an important role in accessing cognitive structures, as it allows to capture complex relationships between facts, assumptions and beliefs that might be isolated in the verbal representations. As new technologies have slid into the field of psychology, these findings were investigated in the context of VR environments. Immersive VR has the capability to elicit emotional responses through visual and auditory manipulation that is connected closely with the sense of presence the user experiences and affects the way users behave, feel and think [7]. Those affordances can make exposure to VR stimuli

effective in treating flying phobia [1], public speaking anxiety [2], managing negative thoughts [3], and enhancing climate change engagement [4]. Based on those findings, it can be assumed that exposure to an immersive view of Earth from space could trigger a positive attitude shift as well. In this study, the measure of the attitude shift is limited to four elements: perceptions of Earth, perceptions of space, appreciation of life and relating to others, that were reported to occur among astronauts who participated in a space flight at least once in their life [5].

3 METHOD

The experiment was conducted under a sample of 20 participants (14 female, 6 male) aged 20 - 62 years. The experimental design was based on a one-factor repeated measures design within one sample group. All participants completed a pre-test online survey - a shortened and adapted version of Positive Effects of Being in space (PEBS) questionnaire. The second part of the experiment had the form of individual sessions, where each participant played Astronaut VR on the Oculus Gear VR set and filled in a second online questionnaire, comparable to the pre-test survey.

4 CONCLUSION

A T-test for repeated measures assuming normal distributed difference scores revealed a significant positive difference in mean scores between the post-test ($M=5.69$, $SD=1.07$) and pre-test conditions ($M=5.27$, $SD=.59$), which implies that such attitude change through VR is possible. The shift was noticeable among all four subscales, however, the two strongest impacts were observed regarding the perception of Earth and appreciation of life. This study seems to be the first one to link the positive attitude shift of the overview effect with the explanatory power of the psychological concept of Cognitive Reframing, what establishes the ground for the future investigation.

REFERENCES

- [1] Rosa Maria Baños et al. "Virtual reality treatment of flying phobia". In: *IEEE Transactions on Information Technology in Biomedicine* 6.3 (2002), pp. 206–212.
- [2] Margalit Bar-Zvi. "Virtual reality exposure versus cognitive restructuring for treatment of public speaking anxiety: A pilot study". In: *The Israel journal of psychiatry and related sciences* 48.2 (2011), p. 91.
- [3] Arianna Prudenzi et al. "Testing the effectiveness of virtual reality as a defusion technique for coping with unwanted thoughts". In: *Virtual Reality* (2018), pp. 1–7.
- [4] Anna Carolina Muller Queiroz et al. "Immersive Virtual Environments and Climate Change Engagement". In: *Immersive Learning Research Network Conference 2018 Montana* (2018), p. 153.
- [5] Jennifer Boyd Ritscher, Eva C Ihle, and Nick Kanas. "Positive psychological effects of space missions". In: *Acta Astronautica* 57.2-8 (2005), pp. 630–633.
- [6] James P Robson Jr. "A concept analysis of cognitive reframing". In: *Journal of Theory Construction & Testing* 18.2 (2014), p. 55.
- [7] Maria V Sanchez-Vives and Mel Slater. "From presence to consciousness through virtual reality". In: *Nature Reviews Neuroscience* 6.4 (2005), p. 332.

- [8] Robert K Throop and Marion B Castellucci. *Reaching your potential: Personal and professional development*. Cengage Learning, 2010.