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Author: Dr. Annahita Nezami
City University of London, United Kingdom

DEEP SPACE MISSIONS: CAN A VIRTUAL REALITY (VR) BIOFEEDBACK PLATFORM BASED ON THE OVERVIEW EFFECT EXPERIENCE STRENGTHEN INTEROCEPTION, ELICIT PROSOCIAL EMOTIONS, AND STRENGTHEN ENVIRONMENTAL RELATEDNESS?

Abstract

Interest in planning manned interplanetary missions has increased over the years, with long-duration journeys beyond low Earth orbit towards the Moon and Mars becoming a possibility in the not so distant future. Despite the progress made, missions such as this continue to present multiple challenges including exposure to increased radiation, sensory inhibition, alteration in gravity, isolation and confinement and being in a hostile and dangerous environment. Before embarking on complex missions such as this, it is imperative to research and design robust psychosocial well-being solutions that can help crew members adjust, acclimatize, and even thrive.

Our affinity to nature (biophilia) has played an important role in supporting our mental and physical well-being and ensuring our species survival here on Earth (Stone et. al, 2014; Anderson et al., 2017). However, less than six hundred people have actually had the unique opportunity to encounter a drastically different perspective of life, nature, the planet, and the cosmos. The Overview Effect (OE), a term coined by Frank White (1987, 2014), describes a psychological state that can emerge when witnessing remarkable natural landscapes from an expansive vantage point, and with the advent of humans' ability to reach space, Earthgazing from orbit or the Moon is the epitome of this experience (Yaden 2016, Nezami, 2017; Kanas, 2018).

The purpose of this study is to test a meditative Virtual Reality (VR) biofeedback platform based on the Overview Effect experience on the ISS to assess its effects on emotions and self-regulation. Wearable Integrated biosensors measure emotional states and record a dataset that can be used by individual members of the crew during the immersion or by ground control to further mitigate risk and promote health. Combining VR and biofeedback technologies in this way offers an interactive multisensory experience that can help astronauts and cosmonauts learn stress regulation and pain management skills. Furthermore, a well-being approach that can support adjustment and acclimatisation to the immediate natural environment (in this case, space), promote group cohesion and improve interoception practices will play an important role in maintaining overall mental health on future space missions.