Space, Science, and Spirituality

Space, Science, and Spirituality was a two-year research project funded by The John Templeton Foundation involving collaboration among researchers from Prodigy, the E2i lab, and the Department of Philosophy at the University of Central Florida, Department of Philosophy at the University of Memphis, the Bildakt Research Group at Humboldt University's (Berlin) Research Group, and astronauts. This research team investigated the effects of outer space travel on experiences of awe, wonder, curiosity, and humility (AWCH) during space flight as reported by astronauts. The aim for this project was to see if the experience of AWCH could be induced in a simulation environment and if so, identify the associated physiological responses. This project utilized a neurophenomenological approach for experimentation, which integrates neurophysiological devices (EEG, ECG, fNIR), phenomenological interviews, Simulation science, hermeneutics, art history, and image analysis were the foundations for simulation development. Prodigy and the Department of Philosophy from both universities hosted the first International Conference on Awe and Wonder.

Experiments

During the first experiment of this project, software developed at the University of Memphis and UCF's Philosophy Department analyzed astronaut reports. E2i developed a mixed reality simulated environment to induce experiences like those described by astronauts in space flight. Researchers at Prodigy utilized the space simulator while implementing a neurophenomenological experiment during the experiment to evaluate the experience of AWCH. This experiment showed that the simulation did induce the experience of AWCH for many and there were associated physiological responses of experiences compared to non-experiencers.

The second experiment sought to determine if only visuals were enough to induce the experience of AWCH. A new simulation was created that used Northrup Grumman's 120°, 6 foot tall Virtual Immersive Portable Environment (VIPE). A neurophenomenological approach was employed.

Results

Results from both experiments showed that simulation is capable of eliciting feeling of AWCH and that several physiological markers are able to differentiate between experiencers and non-experiencers of AWCH. The higher a person rated in religious and spiritual practices, the more likely he would experience AWCH. A neurophenomenological approach is effective at evaluating complex constructs of affective states.

Research Applications

- Understand astronauts' experiences during space flights for future expeditions such as long duration and commercial flights
- Understand physiological markers of awe and wonder
- Provide valuable entertainment information for Kennedy Space Center, museums, amusement parks, simulations for demonstrations, and video games

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