

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Interactive Presentations - IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (IP)

Author: Mr. Mateusz Daniol
AGH University of Science and Technology, Poland, daniol@agh.edu.pl

Dr. Agata Kolodziejczyk
Analog Astronaut Training Center, Poland, fichbio@gmail.com
Mr. Matt Harasymczuk
Analog Astronaut Training Center, Poland, matt@astronaut.center

IMPROVEMENT OF SUBJECTIVE TIME PERCEPTION AND WORK EFFICIENCY IN ISOLATION
VIA DEDICATED BIOFEEDBACK ANDROID APPLICATION MSTPA (MOBILE SUBJECTIVE
TIME PERCEPTION ANALYSIS)

Abstract

Human brain developed functionally different mechanisms for timing across different timescales depending on external stimuli such as light or social inputs. Isolation is a kind of sensory deprivation effect on the brain influencing time perception. It has been also proven, that isolation affects productivity at work, especially in space. In this study we present data from people living in isolation from sunlight and time. We wondered if using virtual stimuli via dedicated biofeedback Android application may improve both subjective time perception and work efficiency in humans.

The application, based on gamification mechanisms, consisted of three modules: passive time perception, active time perception and work efficiency test. In the passive time perception module, the user is presented with an image for a certain amount of time, and then the user has to guess how long the image has been shown. In the active time perception module, the user's task after the image has been displayed is to press a button as quickly as possible and hold it for as long as the image has been displayed. Finally, work efficiency test was based on simple survey compatible with the mission schedule and its tasks.

Sixty (60) analog astronauts performed standardized lunar analog missions. All subjects lived in same environment, eaten same food and were asked to drink same amount of water. Volunteers performed same type of tasks during the day. This means that all subjects had same external brain stimulation. Mounted in this conditions, analog astronauts performed several time perception tests including Android application loaded on their private mobile devices. Each person was asked to use the application before, after and during the mission. During the mission tests have been performed in three timepoints per day – 1 hour after wake-up, 3 hours after wake-up, 3 hours before going to sleep and 1 hour before going to sleep. Obtained data were analyzed statistically. Effects of using described application were detected, what brings better understanding of using virtual stimuli and biofeedback methods in isolation, during long-time missions and for improvement of daily life, especially for seniors and people with sensory deprived life.