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FACTORS OF THE BUILT ENVIRONMENT AFFECTING COGNITIVE, BEHAVIORAL, AND
PSYCHOLOGICAL HEALTH

Abstract

Cognitive, behavioral, and psychological (CBP) risks to space exploration mission crews grow with increased mission duration and distance from Earth. The isolated, confined, extreme (ICE) environment of space experienced in low-Earth orbit (LEO) becomes more severe as the view of Earth disappears, and increasing system complexity leads to potentially incompatible human-architecture interfaces. Past space habitats have not explicitly designed for CPB needs, and the current laboratory model of the International Space Station is insufficient for mitigating these risks. We are investigating how to design space architecture to provide passive behavioral health countermeasures for a more resilient, self-sufficient, curious, and psychologically safe crew, which is critical for the planetary exploration paradigm NASA is working toward.

We investigate the human-environment relationship, particularly for evidence of the physical environment impacting human behavior, experience, and affect. We perform statistical analysis on qualitative oral history data from Skylab, Shuttle, MIR, and ISS astronauts and consider analog habitats as well. Here, we provide a summary of our findings and pose architectural design guidelines that can serve as countermeasures for CBP risks.