

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Behaviour, Performance and Psychosocial Issues in Space (1)

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INCREASED CREWMEMBER AUTONOMY DURING LONG-DURATION SPACE MISSIONS

Abstract

PURPOSE: During long-duration space missions, such as expeditions to Mars or to an asteroid, the long distances involved and the resultant two-way communication delays with mission control on Earth will result in the crewmembers having more autonomy than during previous space missions on-orbit or to the Moon. It is important to study the impact of high autonomy on the behavior and performance of isolated crewmembers. **METHODOLOGY:** Our group has conducted a series of space simulation studies funded by NASA and the National Space Biomedical Research Institute measuring the effects of high crewmember autonomy (i.e., infrequent contact with outside monitors and delayed communication times) versus low crewmember autonomy (i.e., frequent crewmember-outsider interactions in real time) on both isolated crews and non-isolated personnel monitoring their activities in “mission control”. Subjects completed measures that were similar to those used in our previous on-orbit research involving the Mir and International Space Stations, which evaluated both crewmember and mission control subjects over time in terms of mood states, group environment and interactions, and outcome. **RESULTS:** Both qualitative and quantitative analyses were used. The results generally supported the safety and feasibility of high autonomy conditions as compared to more typical conditions using low autonomy. **CONCLUSIONS:** The results suggest a number of countermeasures to help expeditionary crewmembers deal with some of the issues resulting from high autonomy conditions, which will be discussed. Future research should consider using larger subject samples and missions to the ISS and the Moon in order to help us further understand the effects of high autonomy during actual expeditionary space missions beyond the Earth’s immediate neighborhood.