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PERSONAL VALUES AND CREW COMPATIBILITY DURING A SIMULATED SPACE MISSION

**Abstract**

In future space missions to the Moon or Mars, the long distances involved and social isolation will result in high levels of autonomy among crew members. One important question is how the personal values of crew members are likely to change over the course of the mission and the impacts of values on crew compatibility and sources of frustration. We addressed these issues during a 105-day confinement study in which a multinational crew simulated a number of scenarios related to launch, the outbound and return journey to Mars, and transfer to and from the Martian surface. Method: The Portraits of Crew Values Questionnaire (PCVQ) was administered at regular intervals to assess personal values, perceived value differences among crew members, and tension emerging from value disparities. Semi-structured, individual interviews were conducted before and after the confinement. Post-confinement interviews were analysed employing template analysis. Results: Relative to the pre-mission assessment, the crew showed a significant increase in value heterogeneity during the confinement. The largest variance was found in hedonism. The crew became divided into three stable subgroups that cut across nationalities. Both interview data and PCVQ scores indicate that similarities in values were important for two subgroup formations as well as for crew dynamics. One subgroup was described by higher emphasis on hedonism and power, and lower emphasis on benevolence as compared with the rest of the crew. This subgroup presented strong frustration about the quantity and quality of the food supplied, refused to eat the food, and consequently lost weight in the first half of the confinement. The frustration was mostly directed towards outside personnel. A second subgroup was described by high emphasis on tradition and conformity as compared with other crew members. This subgroup expressed frustration with work organization and discipline, including issues related to hygiene. Weak leadership was discussed as a contributing factor. Crewmembers' perceptions of interpersonal stressors and tension decreased when the crew was allowed a higher level of autonomy in the last month of the confinement. Conclusions: A concern has been that confined crew over time become more similar in "mindset", and that this may cause "groupthink". No evidence for such effects was found in this study. Sharing personal values seemed to play important roles for subgroup formation and sources of tension. Implications for crew composition and leadership related to long duration missions will be discussed.