

Topic: I.2 (Living in Space/Psychosocial aspects)

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IDENTIFYING THE UNKNOWN: FACTORS AFFECTING PSYCHOLOGICAL WELL-BEING OF THE CREW DURING MISSIONS TO THE MOON AND MARS

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BACKGROUND and PURPOSE:

The purpose of this study is to provide guidance for the design of psychological support tools for a crew that will travel where no human has been before, where the crew will be dependent on each other and have no hope of rescue in the face of unforeseen mentally challenging or life-threatening events. A systematic and innovative approach is used to define a range of factors that can have an unforeseen psychological impact on the crew during this endeavour.

METHOD:

This study examines existing approaches to define factors, which have an effect on a crew's well-being in space and other extreme environments. Second, the classification and description of factors' categories are examined if they may be used to inform design requirements of future tools for psychological support. Lastly, a different innovative approach to the categorisation of factors is proposed that is more suited for the purpose of this study.

RESULTS:

As a result, a *contradicting matrix* is generated that categorises factors. The categories are thought of as layers of protective shells from psychological stressors and the environment that the crew will be faced with throughout missions. Sixty-seven factors were identified that fit within seven protective shells and the environment. The protective shells have a particular structure and power. They start from an inner primal biological shell, which is the hardest to be affected by psychological stressors and the outer last, non-protective, but the most hostile layer, is the external environment. The external environment causes the most important threat to life for astronauts and enforces conditions of isolation and confinement in which the crew have to work and live.

A total of 2278 individual issues are found in the matrix. This matrix gives an opportunity to identify, prior to the mission, potential situations that the crew will face during an exploration mission. Through examination of space psychology literature and studies of extreme and isolated environments, the matrix shows the number of issues observed and considered to date, which is approximately only 25% of potential issues.

CONCLUSIONS:

Psychological issues that the crew can endure during missions to the Moon and Mars cannot be predicted, but can be explored through a systematic definition of factors and conditions under which they can occur. An inductive approach that generated the matrix was used to define the factors and conditions under which the crew will be working and living. As a result 36 categories of factors were identified that lead to conditions that can trigger psychological issues to arise, which need to be addressed in a design of tools for psychological support.

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