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ANALYSIS OF SPACE DRAGONS: A FRAMEWORK FOR PSYCHOLOGICAL SAFETY FOR LONG DURATION SPACEFLIGHT.

Abstract

As the space industry prepares for Moon and Mars exploration missions, psychological safety is becoming a higher priority. Current countermeasures, including selection, pre-flight training, and regular psychologist meetings are considered safe for shorter spaceflights (¡one year) in low Earth orbit or short Lunar surface missions. However, these are not considered adequate for exploration missions (¿ two years). The resulting risk of human error could determine the mission success or failure and long duration flights are a no-go until adequate countermeasures are found. This paper presents the analysis of Space Dragons as a countermeasure for psychological risk and makes recommendations for future validation experiments based on current findings.

Psychological safety is a critical factor in performance of high functioning teams. As latency of up to 20 mins each way will hamper real time support from mission control, crew will need to manage their psychological health autonomously. The Space Dragons framework is a protocol of activities which curate psychological safety for crew in space environments. It is delivered by a crew facilitator via pre-training workshops, recorded video and audio resources, and an integrated program of activities within the daily inflight schedule. Space Dragons draws on training techniques from the arts, theater, mindfulness, martial arts and clinical psychology. The approach is preventative. Space Dragons provides language for leaders to engage with the emotional layer of processes that underpins effective decision making. This includes team wellbeing, maintaining flow state, crisis management skills, conflict resolution and honoring cognitive diversity. It creates an instinctive framework from which to communicate cognitive and physical needs, stressors and resolutions.

This study includes post-event analysis of an initial feasibility experiment, a comparative investigation of existing protocols and countermeasures, research into effective test methods and the gathering of insights from experienced analog experts through interviews. Analysis of the initial experiment was conducted using qualitative data from self report questionnaires and daily creative practice from EMMPOL III, IV

(controls) V (test) missions at the Analog Astronaut Training Center in Poland in May 2021. Results show that crew using Space Dragons reported decreased levels of stress, increased levels of care and an increased level of readiness compared to the other missions. No conflicts were reported. These findings are promising when considering anecdotal evidence gathered from experienced analog staff and crew who report a high incidence of stress and conflict during missions. Recommendations for further studies include longer duration analogs, more refined testing methods, a defined crew selection process, including a facilitator skill set with an emphasis on social science and so called 'soft' interpersonal skills.