MEASURING UNIQUE CONTEXTUAL FACTORS: GROUP LIVING SKILLS

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BACKGROUND

The Human Factors and Behavioral Performance Exploration Measures (HFBP-EM) suite is a set of standardized measures used to assess behavioral health and performance risks related to future exploration-class space missions. During the HFBP-EM suite development, the importance of assessing unique contextual factors to understand the drivers of team dynamics was identified. Group living skills are a unique workplace skill which applies to those coworkers who live and work together. As mission lengths become longer, the line between work and non-work life may blur. Extreme living conditions such as spaceflight can result in increased stress over time, negatively impact mood and well-being, decrease team cohesion and increase conflict, deteriorate task performance, and potentially reduce mission success [1]. With no breaks in their isolated and confined environment possible, living with a messy, inconsiderate crewmember can add to the stress. Alternatively, crews with good group living skills may support one another, mitigating the negative effects of the extreme environment. There was no direct measure of group living skills. This work sought to fill this measurement gap and collect data related to group living in isolated, confined, extreme (ICE) environments.

METHODS

Group living skills as an astronaut competency area were developed with the input of experts familiar with ICE environments. Distinct aspects of this competency were reviewed and discussed by a NASA-invited group of spaceflight experts in 2015 to identify individual and team behavioral health and performance measures for operational environments. This work resulted in a 5-item measure focused on group living experiences with each crewmember (or the crew as a whole). A 6th item asks whether an individual would go on another mission with a particular crewmember or crew as a measure of future-oriented group living, or team viability. The measure was deployed in 24 teams living and working together in isolated and confined environments (e.g., International Space Station, space mission simulation analogs).

RESULTS & DISCUSSION

In this presentation, we will summarize results which indicate the Group Living Skills (GLS) Survey is a reliable, valid, and operationally feasible measure. Reliability was evaluated in several ways. Two-way multilevel mixed models revealed strong repeated measures reliability (ICC2 = .902, Omega between = .954). Reliability of change within teams was strong (Rc = .81). Factor analysis showed a consistent two-factor structure when individuals rated either the whole crew, all individuals, just peers, or a focal roommate. The latter used a sociometric approach to rating the GLS of the roommates. The two factors were tidiness and being considerate of others. We assessed the criterion-related validity of GLS, by examining GLS operationalized as the team-level aggregated GLS Survey scores as a predictor of team viability, team cohesion, and team performance. We used generalized mixed models to account for the repeated measures and longitudinal data. The marginal R² change was used to determine the extent to which GLS were related to the team outcomes while controlling for mission day and campaign. Results suggested GLS was strongly related to team viability (marginal R2 change = .40), team cohesion (marginal R2 change = 0.28), social cohesion (marginal R2 change = 0.25), and moderately related to task cohesion (marginal R2 change = 0.18). GLS scores had a small relationship with team performance (marginal R2 change = .08). Results support GLS as a measure that can be used to capture group living skills of crews who live and work together in ICE. Because the items were written to be broadly applicable, less extreme environments with teams living and working together for some length of time also benefit from this measure (e.g., college roommates, camps). See Landon et al. (2024) for full results [2].

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REFRENCES

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SUMMARY

We report reliability and validity evidence for a new measure that assesses the Group Living Skills for teams that live and work in operational environments such as spaceflight.