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SUPPLEMENTING VIRTUAL REALITY TOOLS FOR EMPATHY, AUTHENTIC RELATIONS, AND  
CONFLICT RESOLUTION FOR ANALOG ASTRONAUTS LIVING IN ISOLATED, CONFINED, AND  
EXTREME (ICE) ENVIRONMENTS**Abstract**

Living and working in space as well as future Mars settlements will put astronauts and settlers in isolated, confined, and extreme (ICE) environments, subjecting individuals to difficult conditions. Teams from all over the world, with disparate cultures, disciplines, personalities and skills will need to collaborate for these missions and settlements to succeed. Understanding human factors, building trust, teaching conflict resolution strategies, and developing crew cohesion are paramount for both pre-simulation activities and during missions. Much research has been done on supplementing Virtual Reality as a teaching tool, suggesting it is becoming an effective tool for learning, memory retention, and building empathy for mutual understanding. Individuals learn new behaviors best by observing and imitating others. Due to its immersive experience, Virtual Reality has been found an effective way of helping users mimic and experience, effectively enabling “learning by doing”. In addition, a plethora of team effectiveness, bonding and conflict resolution techniques have been studied and successfully applied across corporate and other social team dynamics settings. However, vast majority of existing ICE research is fragmented and does not intersect with the broader literature on team effectiveness. In collaboration with Mars Academy USA (MAU), Benifand K., and Lang J., are working on a longitudinal study and developing and testing a suite of Virtual Reality conflict resolution and authentic relations tools that are being applied and tested during pre-simulation and analog mission simulations in low and mid fidelity settings. The Virtual Reality scenarios being developed and tested include: • Analog Astronaut engaging in conflict scenes and possible conflict resolutions, including crew mutiny, psychological and mental health issues. • Stress-induced scenes and solutions showing various ways to address these problems, improvement in communication strategies, improvement in task and time management • Leadership and followership issues and strategies, as well as empathy, compassion and love. To measure effectiveness, both qualitative (self-assessments and daily reflection tools) as well as quantitative tools including obtaining biometrics measurements before, during and after the VR experiences are being used. Development and testing of this research can support the future workforce in space and in other extreme environments (e.g., polar, deep sea, and highaltitude exploration), and may offer insights for extreme action teams facing challenging working and living conditions with frequent stressors.