Fiscal Year:	FY 2019	**Task Last Updated:**	FY 08/22/2018
PI Name:	Tannenbaum, Scott Ph.D.		
Project Title:	A Multi-faceted Approach to Examine Team Adaptation & Resilience within Isolated, Confined, and Extreme Environments		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Behavior and performance		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HFBP**:Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	(1) **BMed**:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) **Team**:Risk of Performance and Behavioral Health Decrements Due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Albany	**State:**	NY
Zip Code:	12203-6006	**Congressional District:**	20
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2015-16 HERO NNJ15ZSA001N-Crew Health (FLAGSHIP, NSBRI, OMNIBUS). Appendix A-Crew Health, Appendix B-NSBRI, Appendix C-Omnibus
Start Date:	10/23/2017	**End Date:**	03/12/2020
No. of Post Docs:	0	**No. of PhD Degrees:**	0
No. of PhD Candidates:	0	**No. of Master' Degrees:**	0
No. of Master's Candidates:	0	**No. of Bachelor's Degrees:**	0
No. of Bachelor's Candidates:	0	**Monitoring Center:**	NASA JSC
Contact Monitor:	Williams, Thomas	**Contact Phone:**	281-483-8773
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Flight Program:			
Flight Assignment:	NOTE: Change in period of performance and grant number per J. Garrett/JSC HRP (previous 10/1/2016-9/30/2019, grant NNX16AM17G)--Ed., 7/5/18		
Key Personnel Changes/Previous PI:	N/A		
COI Name (Institution):	Mathieu, John Ph.D. (The Group for Organizational Effectiveness, Inc.) Maynard, Michael Ph.D. (Safer Healthcare Partners, LLC)		
Grant/Contract No.:	80NSSC18K0092		
Performance Goal No.:			

Performance Goal Text:	
Task Description:	The success of future long duration exploration missions (LDEM) is likely to be contingent on the crew's ability to adjust in response to environment demands. There has been recent interest in team adaptation and resilience in the scientific community, but researchers have noted the need to clarify those constructs. We propose a program of research to: a) clarify and better understand these constructs, in particular with how they operate in isolated, confined, and extreme (ICE) environments and b) based on that enhanced understanding, develop and test targeted countermeasures designed to boost the adaptability and resilience of LDEM crews. Work conducted by Maynard and colleagues (2015), supplemented by the team resilience work of Alliger et al. (in press) – all members of our research team – provides a "road map" for the proposed research. We plan to examine the impact of different environmental triggers on team adaptation, incorporating an event taxonomy and categorization schema with which to assess experiences and trigger events. This will allow us to index the types of challenges that LDEM crews will confront. We will test a series of related hypotheses using archival data we collected in prior research in the Human Exploration Research Analog (HERA) habitat. We will then examine antecedents and outcomes of adaptation, gathering data in two analog environments. Finally, based on the theoretical and preliminary empirical work, we will develop a team countermeasure designed to promote constructive team adaptation and team resilience, and test those countermeasures in an analog environment. References Maynard, MT, Kennedy, DM, & Sommer, SA. (2015). Team adaptation: A fifteen-year synthesis (1998–2013) and framework for how this literature needs to "adapt" going forward. European Journal of Work and Organizational Psychology, 24, 652-677. Maynard, M. T., Kennedy, D. M., Sommer, S. A., & Passos, A. M. (2015). Team Cohesion: A theoretical consideration of its reciprocal relationships within the team adaptation nomological network. In: E. Salas, Research on Managing Groups and Teams, 17, 83-111.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	There is a need for LDEM crews to adapt and sustain their resilience as a team. Researchers have traditionally examined adaptation and resilience from an individual perspective, but to ensure that Long Duration Exploration Mission (LDEM) crews are ready for the challenges they will face, there is a need to better understand how adaption and resilience operate at the team level. Doing so will allow for the development of validated countermeasures that can be deployed prior to and at appropriate times during a mission, increasing a LDEM crew's ability to handle the stressors associated with ICE environments and enabling them to adjust when unexpected challenges emerge. It addresses the need to learn more about team adaptation and resilience, as well as the need to develop and test potential countermeasures.
Task Progress:	We have developed research protocols and measurement tools for conducting studies in two analog environments, the Hawai'i Space Exploration Analog and Simulation (HI-SEAS) and NASA's HERA environment, as well as for one field environment, Deep Sea Saturation Dive (SAT) teams. The contextualized surveys developed for each environment are designed to collect data about key adaptation factors including, for example, trigger events, challenges encountered, adaptation responses, performance data as well as overall perceptions of the mission. We gathered weekly data from a HI-SEAS crew over an 8-month long mission. We also collected daily data from 13 SAT dive teams during their 28-day undersea missions. We have received IRB (Institutional Review Board) approval to participate in the HERA C5 mission in early 2019. In addition, we have begun analyzing archival data we previously collected during the HERA 1 mission, commenced coding the data collected in the HI-SEAS and SAT dive team studies, and started initial work on identifying promising countermeasures.
Bibliography Type:	Description: (Last Updated: 02/02/2024)
Abstracts for Journals and Proceedings	Maynard MT, Mathieu JE, Tannenbaum SI. "Adapting to uncertainty: An examination of teams in extreme environments." Presented at the 78th Annual Meeting of the Academy of Management, Chicago, IL, August 10-14, 2018. 78th Annual Meeting of the Academy of Management, Chicago, IL, August 10-14, 2018. , Aug-2018
Abstracts for Journals and Proceedings	Tannenbaum SI, Maynard MT, Mathieu JE, Bedwell WL. "Challenges, team adaptation, and resilience in extreme environments." Poster presented at the 2018 NASA Human Research Program Investigators' Workshop, Galveston, TX, January 22-25, 2018. 2018 NASA Human Research Program Investigators' Workshop, Galveston, TX, January 22-25, 2018. , Jan-2018
Articles in Peer-reviewed Journals	Lacerenza CN, Marlow SL, Tannenbaum SI, Salas E. "Team development interventions: Evidence-based approaches for improving teamwork." Am Psychol. 2018 May-Jun;73(4):517-31. https://doi.org/10.1037/amp0000295 ; PubMed PMID: 29792465 , May-2018