Fiscal Year:	FY 2015	**Task Last Updated:**	FY 07/31/2014
PI Name:	Tannenbaum, Scott Ph.D.		
Project Title:	Composing and Developing Resilient, Adaptive, and Self-Sustaining Teams for Long Duration Space Exploration		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **BHP**:Behavioral Health & Performance (archival in 2017)		
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		
PI Email:	scott.tannenbaum@groupoe.com	**Fax:**	FY
PI Organization Type:	INDUSTRY	**Phone:**	518-456-7738
Organization Name:	The Group for Organizational Effectiveness, Inc.		
PI Address 1:	727 Waldens Pond Road		
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PI Web Page:			
City:	Albany	**State:**	NY
Zip Code:	12203-6006	**Congressional District:**	20
Comments:			
Project Type:	Ground	**Solicitation / Funding Source:**	2010 Crew Health NNJ10ZSA003N
Start Date:	10/01/2011	**End Date:**	03/31/2016
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:	4	**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:	20	**Monitoring Center:**	NASA JSC
Contact Monitor:	Leveton, Lauren	**Contact Phone:**	
Contact Email:	lauren.b.leveton@nasa5.gov		
Flight Program:			
Flight Assignment:	NOTE: End date is now 3/31/2016, per NSSC information (Ed., 4/14/15) NOTE: End date is now 4/30/2015, per NSSC information (Ed., 7/14/14)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Alliger, George (The Group for Organizational Effectiveness, Inc.) Mathieu, John (University of Connecticut) Salas, Eduardo (University of Central Florida)		
Grant/Contract No.:	NNX11AR22G		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Flight crews in Long Duration Space Exploration (LDSE) missions are isolated for prolonged periods with access to only limited, time-lagged communications with ground operations. This creates numerous team-related challenges. Under such conditions, a single crew member who is a "poor fit" can jeopardize mission effectiveness, and even a well-formed team must adapt during its time together to remain effective. The proposed research addresses how best to compose an LDSE team, as well as how to use subsequent team countermeasures to optimize team resilience, adaptability, and viability during a mission. The research program represents a synthesis of existing technologies and knowledge, and the advancement of new methods and applications, all grounded in the unique demands of LDSE. We consider team effectiveness as not only traditional task performance, but also, given the LDSE setting and mission, team sustainability and viability over time. Based on a synthesis of existing research, input from subject matter experts, and new empirical studies, we will recommend evidence-based guidelines for composing LDSE flight teams, identify diagnostic measures to guide preemptive actions, and prototype a self-sustainment countermeasure to address psychosocial vulnerabilities.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	The isolation and time-lagged communications that astronauts experience in Long Duration Space Exploration (LDSE) can create numerous team-related challenges (Caldwell, 2005; Dion, 2004; Halbesleben, Bowler, 2007; Schmidt, Keeton, Slack, Leveton, & Shea, 2009). Mitigating these challenges involves not only selecting appropriate crew members but also ensuring that they have sufficient team resilience, adaptability, and vitality to meet the demands of LDSE. This multi-year effort focuses on assisting the LDSE team formation process by extending traditional team member selection models to integrate teamwork and psychosocial requirements with traditional position and mission requirements; utilizing longitudinal multiplex network analysis techniques to better diagnose and anticipate challenges to team coordination and effectiveness before they evolve into problems that could impact team viability and mission success; helping teams sustain their performance and coordination over the duration of the mission by building upon existing debriefing techniques and developing diagnostic-driven, team-guided countermeasures that address psychosocial needs and vulnerabilities as well as more traditional team development needs.
Task Progress:	gOE (Group for Organizational Effectiveness, Inc.) has integrated and synthesized relevant research on team composition and developed an understanding of the requirements of an LDSE mission. As a result, we view composition as a co-variate, resilience as a key measure, debriefing as a countermeasure. We also recognize the potential importance of unobvious measurement. Our initial work established the basis for our Year 3 empirical research studies. Proposed tasks for Year 3 included: 1) Choose/develop targeted diagnostic and criterion measures for use in the ground based research, and 2) Test the team composition variables, team diagnostics, and/or targeted countermeasure with a ground based sample. During Year 3 we made progress on the proposed tasks. We finalized diagnostic and criterion measures for our ground based research and we gathered empirical data from three research environments, including a lab study with students, an analog study in a confined environment with teams of adults during a 7-day mission, and a NEEMO undersea analog study conducted with astronauts. More specifically, gOE developed measures to inform and test team composition, team development, and team resilience. We finalized a set of team self-report measures including the development of new measures of team resilience and living preferences; we established and developed team self-sustaining debriefs as a target countermeasure; and made progress on the establishment of several unobtrusive measures of team dynamics. In Year 3, we completed gathering data from our lab study at the University of Central Florida (UCF) using college students as subjects. We also initiated two new studies with ground-based samples at both the HERA and NEEMO analog environments. In these three studies we are examining team composition as well as countermeasures to develop and maintain team resilience under isolated and confined conditions. We developed mission specific team debrief content for each environment and populated the DebriefNow tool with that content. We gathered and are currently analyzing data on the debriefing countermeasure from the lab, HERA, and NEEMO samples. During year 3 we published a study in a top journal (Personnel Psychology) that shows how a guided team-led debriefing countermeasure enhances teamwork and subsequent performance over an unguided team-led debriefing technique. We used that guided team-led debriefing technique in our lab study, and extended and are testing it during our research in the HERA and NEEMO environments. During year 3 we also drafted a NASA focused white paper on team composition and published an article on team composition in a top journal (Journal of Management).
Bibliography Type:	Description: (Last Updated: 02/02/2024)
Articles in Peer-reviewed Journals	Eddy E, Tannenbaum SI, Mathieu JE. "Helping teams to help themselves: Comparing two team-led debriefing methods." Personnel Psychology. 2013 Winter;66(4):975-1008. http://dx.doi.org/10.1111/peps.12041 , Oct-2013
Articles in Peer-reviewed Journals	Mathieu JE, Tannenbaum SI, Donsbach JS, Alliger GM. "A review and integration of team composition models: Moving toward a dynamic and temporal framework." Journal of Management. 2014 Jan;40(1):130-60. http://dx.doi.org/10.1177/0149206313503014 , Jan-2014
Books/Book Chapters	Lacerenza C, Gregory M, Marshall A, Salas E. "Debriefs: The learning meeting." in "The Science of Workplace Meetings." Ed. J. Allen, N. Lehmann-Willenbrock, S. Rogelberg. New York: Cambridge University Press. In press as of August 2014., Aug-2014