

<b>Fiscal Year:</b>	FY 2016	<b>Task Last Updated:</b>	FY 07/14/2016
<b>PI Name:</b>	Tannenbaum, Scott Ph.D.		
<b>Project Title:</b>	Composing and Developing Resilient, Adaptive, and Self-Sustaining Teams for Long Duration Space Exploration		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	HUMAN RESEARCH		
<b>Program/Discipline-- Element/Subdiscipline:</b>			
<b>Joint Agency Name:</b>		<b>TechPort:</b>	No
<b>Human Research Program Elements:</b>	(1) <b>BHP</b> :Behavioral Health & Performance (archival in 2017)		
<b>Human Research Program Risks:</b>	(1) <b>BMed</b> :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) <b>Team</b> :Risk of Performance and Behavioral Health Decrements Due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
<b>PI Email:</b>	<a href="mailto:scott.tannenbaum@groupoe.com">scott.tannenbaum@groupoe.com</a>	<b>Fax:</b>	FY
<b>PI Organization Type:</b>	INDUSTRY	<b>Phone:</b>	518-456-7738
<b>Organization Name:</b>	The Group for Organizational Effectiveness, Inc.		
<b>PI Address 1:</b>	727 Waldens Pond Road		
<b>PI Address 2:</b>			
<b>PI Web Page:</b>			
<b>City:</b>	Albany	<b>State:</b>	NY
<b>Zip Code:</b>	12203-6006	<b>Congressional District:</b>	20
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2010 Crew Health NNJ10ZSA003N
<b>Start Date:</b>	10/01/2011	<b>End Date:</b>	03/31/2016
<b>No. of Post Docs:</b>		<b>No. of PhD Degrees:</b>	1
<b>No. of PhD Candidates:</b>	4	<b>No. of Master' Degrees:</b>	
<b>No. of Master's Candidates:</b>		<b>No. of Bachelor's Degrees:</b>	2
<b>No. of Bachelor's Candidates:</b>	5	<b>Monitoring Center:</b>	NASA JSC
<b>Contact Monitor:</b>	Leveton, Lauren	<b>Contact Phone:</b>	
<b>Contact Email:</b>	<a href="mailto:lauren.b.leveton@nasa.gov">lauren.b.leveton@nasa.gov</a>		
<b>Flight Program:</b>			
<b>Flight Assignment:</b>	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)		
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Alliger, George ( The Group for Organizational Effectiveness, Inc. ) Mathieu, John ( University of Connecticut ) Salas, Eduardo ( University of Central Florida )		
<b>Grant/Contract No.:</b>	NNX11AR22G		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

Task Description:	<p>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.</p> <p>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 resilience 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.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	<p>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, &amp; 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.</p>
Task Progress:	<p>FINAL REPORTING AS OF JULY 2016</p> <p>gOE 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, and debriefing as a countermeasure. We also recognize the potential importance of unobtrusive measurement.</p> <p>During Year 4, we analyzed data gathered in a lab setting. We also gathered additional data in two analog settings: a) at Human Exploration Research Analog (HERA), a confined environment with teams of adults performing a 7-day or 14-day mission, and b) with a second team of astronauts during a ASA Extreme Environment Mission Operations (NEEMO) undersea training mission.</p> <p>More specifically, we gathered a set of team measures, including new measures of team resilience and living preferences; and tested team self-sustaining debriefs as a target countermeasure.</p> <p>During our final year of the grant, we completed the analysis of our studies, integrated the results, and summarized the findings. The pattern of results confirmed that the team debriefing countermeasure is a viable tool for sustaining team resilience and in turn, team performance.</p> <p>ANNUAL REPORT--JULY 2015: gOE 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, and debriefing as a countermeasure. We also recognize the potential importance of unobtrusive measurement. Our prior work established the basis for our Year 4 empirical research studies.</p> <p>Proposed tasks for Year 4 included testing the team composition variables, team diagnostics, and/or targeted countermeasure with a ground based sample.</p> <p>During Year 4, we made progress on the proposed tasks. We analyzed data gathered in a lab setting. We also gathered additional data in two analog settings: a) at Human Exploration Research Analog (HERA), a confined environment with teams of adults performing a 7-day or 14-day mission, and b) with a second team of astronauts during a NASA Extreme Environment Mission Operations (NEEMO) undersea training mission.</p> <p>More specifically, we gathered a set of team measures, including new measures of team resilience and living preferences; and tested team self-sustaining debriefs as a target countermeasure. Preliminary analyses suggest that the debriefing countermeasure has a positive effect on team resilience and performance and is viewed positively by team members.</p>
Bibliography Type:	Description: (Last Updated: 02/02/2024)
Articles in Peer-reviewed Journals	<p>Mathieu JE, Tannenbaum SI, Kukenberger MR, Donsbach JS, Alliger GM. "Team role experience and orientation: A measure and tests of construct validity." <i>Group and Organization Management</i>. 2015 Feb;40(1):6-34. <a href="http://dx.doi.org/10.1177/1059601114562000">http://dx.doi.org/10.1177/1059601114562000</a>, Feb-2015</p>
Articles in Peer-reviewed Journals	<p>Salas E, Tannenbaum SI, Kozlowski SWJ, Miller CA, Mathieu JE, Vessey WB. "Teams in space exploration: A new frontier for the science of team effectiveness." <i>Current Directions in Psychological Science</i>. 2015 Jun;24(3):200-7. <a href="http://dx.doi.org/10.1177/0963721414566448">http://dx.doi.org/10.1177/0963721414566448</a>, Jun-2015</p>
Articles in Peer-reviewed Journals	<p>Alliger GM, Cerasoli CP, Tannenbaum SI, Vessey WB. "Team resilience: How teams flourish under pressure." <i>Organizational Dynamics</i>. 2015 Jul-Sep;44(3):176-84. <a href="http://dx.doi.org/10.1016/j.orgdyn.2015.05.003">http://dx.doi.org/10.1016/j.orgdyn.2015.05.003</a>, Jul-2015</p>
Books/Book Chapters	<p>Lacerenza C, Gregory M, Marshall A, Salas E. "Debriefs: The learning meeting." in "The Cambridge Handbook of Meeting Science." Ed. J. Allen, N. Lehmann-Willenbrock, S.G. Rogelberg. Cambridge: Cambridge University Press, in press as of July 2016., Jul-2016</p>

Dissertations and Theses	Woods AL. "Examining the relationship between trait goal orientation and behavior in team debriefing sessions." Thesis, University of Central Florida, Orlando, FL 2015. , Mar-2015
Dissertations and Theses	Reyes DL. "Shared leadership and team satisfaction: The moderating role of extraversion heterogeneity." Thesis, University of Central Florida, Orlando, FL, December 2014. , Dec-2014
Papers from Meeting Proceedings	Cerasoli CP, Alliger GM, Tannenbaum SI. "Team resilience: Its need, nature, and facilitating factors." In M. Jimenez-Rodriguez and J.A. Gallus (Chairs), Mission possible: The research imperative for understanding resilience in teams. Symposium conducted at the 30th Annual Society for Industrial-Organizational Psychology (SIOP) Conference, Philadelphia, PA, April 23-25, 2015. 30th Annual Conference for the Society of Industrial Organizational Psychology, Philadelphia, PA, April 23-25, 2015. , Apr-2015
Papers from Meeting Proceedings	Tannenbaum SI, Mathieu JE, Alliger GM, Cerasoli CP, Donsbach JS. "Using realistic analog environments to test team self-debriefing for astronauts." In W.B. Vessey (Chair), Teams on ICE: Team Research in Spaceflight Analogs. Symposium conducted at the 30th Annual Society for Industrial-Organizational Psychology (SIOP) Conference, Philadelphia, PA, April 23-25, 2015. 30th Annual Conference for the Society of Industrial Organizational Psychology, Philadelphia, PA, April 23-25, 2015. , Apr-2015
Papers from Meeting Proceedings	Tannenbaum SI, Vessey W, Chan PKF, Green A. "Real Teams, Real Challenges, Real Solutions." A panel presented at the 30th Annual Meeting of Society for Industrial and Organizational Psychology, Philadelphia, PA, April 23-25, 2015. 30th Annual Conference for the Society of Industrial Organizational Psychology, Philadelphia, PA, April 23-25, 2015. , Apr-2015
Papers from Meeting Proceedings	Woods AL. "Examining the relationship between trait goal orientation and behavior in team debriefing sessions." Poster presented at the Twelfth Annual Showcase of Undergraduate Research Excellence, University of Central Florida, Orlando, FL, April 2015. 12th Annual Showcase of Undergraduate Research Excellence, University of Central Florida, Orlando, FL, April 2015. , Apr-2015