

Fiscal Year:	FY 2020	Task Last Updated: FY 06/22/2020	
PI Name:	Bell, Suzanne Ph.D.		
Project Title:	A US-Russian Collaborative Proposal for Data Collection in HERA: The Relationship between Composition, Interpersonal Relations, and Team Effectiveness in Space Crews		
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) 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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Zip Code:	77058	Congressional District:	36
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2015-16 HERO NNJ15ZSA001N-ILSRA. Appendix F: International Life Sciences Research Announcement
Start Date:	08/12/2016	End Date:	06/30/2022
No. of Post Docs:		No. of PhD Degrees:	2
No. of PhD Candidates:	4	No. of Master' Degrees:	6
No. of Master's Candidates:	2	No. of Bachelor's Degrees:	8
No. of Bachelor's Candidates:	0	Monitoring Center:	NASA JSC
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Flight Program:			
Flight Assignment:	<p>NOTE: End date changed to 6/30/2022 per NSSC information; PI now at JSC and extension is for subcontract completion and final reporting (Ed., 10/20/21)</p> <p>NOTE: End date changed to 9/30/2021 per HFBP element; PI now at JSC and extension is for subcontract completion and final reporting (Ed., 6/15/21)</p> <p>NOTE: End date changed to 5/11/2021 per NSSC information (Ed., 8/28/20)</p> <p>NOTE: End date changed to 8/11/2020 per NSSC information (Ed., 7/31/19)</p> <p>NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/17/17)</p>		
Key Personnel Changes/Previous PI:			

COI Name (Institution):	Gushin, Vadim M.D., Ph.D. (Institute of Bio-Medical Problems RAS, Russia) Vinokhodova, Alla Ph.D. (Institute of Bio-Medical Problems RAS, Russia) Contractor, Noshir Ph.D. (Northwestern University) DeChurch, Leslie Ph.D. (Northwestern University)
Grant/Contract No.:	NNX16AQ48G
Performance Goal No.:	
Performance Goal Text:	
Task Description:	<p>The environments anticipated during Long-Distance Space Exploration Missions (LDSEM) will require crews diverse in national background, professional background, and gender to face a number of stressors such as living and working in isolated and confined environments (ICE) for an extended period of time, separation from family and friends, loss of or significant delay when in communication with the ground, and limited privacy. The unique challenges of LDSEM will require team members to rely on one another for social support and to keep conflict manageable. The long-term duration of the mission coupled with extreme living and working conditions means interpersonal compatibility among the crew members, and between the crew and mission control, will be essential to the success of any LDSEM.</p> <p>How crew composition and interpersonal relations affect crew functioning and effectiveness has been and continues to be of interest to both NASA and the Institute of Biomedical Problems (IBMP), whose research informs operations for Roscosmos. Over time, research related to interpersonal compatibility from these agencies has evolved with different emphases. NASA-sponsored team composition research heavily relies on trait and network theories. It seeks to identify traits and combinations of traits that can be used to compose, train, and manage highly effective crews (Team Gap 8). IBMP-sponsored research mostly has moved away from trait-based approaches toward an idiographic (in-depth, heavily descriptive) approach to researching crew interpersonal relations. Our research is a US-Russia collaborative research effort with two primary aims: (1) develop and empirically test a cutting-edge process model of interpersonal relationship formation in ICE, which integrates US and Russian approaches to examining interpersonal compatibility in ICE; and (2) examine the validity of the Personal Self-Perception and Attitudes (PSPA), which is an approach utilized by the Russians to assess interpersonal compatibility and relations in ICE.</p> <p>To address these aims, we are leveraging existing data previously collected in the Mars 105 and Mars 500 simulations; we have completed collecting new analog-definition research data in the Human Exploration Research Analog (HERA) campaigns 4 and 5; and are using a novel data analysis approach. Our efforts will result in research products critical to Team Gaps 1, 4, and 8, including an empirically supported model, recommendations for a path forward for international collaboration in research related to team composition and interpersonal relations in ICE, and a summary of validation evidence for the PSPA with recommendations for whether it should be included in NASA's standardized measures for analog environments.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	<p>Results will contribute to a greater understanding of the life cycle of teams operating in isolated and confined environments (ICE), and the effective composition and management of future space crews. Particularly notable is the integration of Russian and US approaches to researching interpersonal compatibility. Our model makes significant contributions to team composition and interpersonal compatibility research by elaborating and testing the foundations of various states, which are individual, relational, and team events. This advancement is critical for understanding how personal attributes shape the subjective attitudes towards the self and towards others, and how relationships develop over time, which can affect the affect, motivation, cognition, and performance of the team. The specific propositions and research questions developed and tested in HERA are specific to ICE; thus, beyond space crews, the most direct application of the research findings will be to Earth teams that operate in ICE such as expedition and science teams in the Arctic and Antarctic. The general framework and analytic strategies we are developing to research interpersonal relationship formation, however, can be applied to Earth teams more generally.</p>
Task Progress:	<p>We have completed the fourth year of the project. During this past year, we completed data collection from the NASA Human Exploration Research Analog (HERA) Campaign 5, and processed a large amount of data from Campaigns 4 and 5. We have completed coding data from the Multi-Mission Space Exploration Vehicle/Extra-Vehicular Activity (MMSEV/EVA) task, which will be used as an objective, dynamic, and operationally-relevant indicator of team performance in our analyses. We have completed coding behavioral data from our team interaction battery, except the most recently collected mission, for which coding is underway.</p> <p>In regards to Aim 1, we developed an extensive coding handbook and used it to analyze video footage of communication processes within crews during both relational and task events. This will provide data for our relational event modeling. We implemented a team-specific intervention that was created during the previous year to enhance team relations during isolation. Initial evaluations suggest that this intervention helps maintain positive relations between crewmembers in isolation.</p> <p>For Aim 2, we have begun processing Personal Self-Perception and Attitudes (PSPA) data from Campaigns 4 and 5 and incorporating it into our larger datasets. Preliminary analyses show that PSPA metrics (i.e., psychological distance between self and others, discrepancy between current and ideal self) are predictors of outcomes at the individual, dyadic, and team levels.</p>
Bibliography Type:	Description: (Last Updated: 02/15/2024)
Books/Book Chapters	Bell ST, Roma PG, Caldwell BJ. "Special considerations for conducting research in analog environments: Challenges, solutions, and what is needed." in "Psychology and Human Performance in Space Programs. (Research at the Frontier, Vol. 1)" Ed. L.B. Landon, K.J. Slack, E. Salas. In press, as of June 2020., Jun-2020
Books/Book Chapters	Bell ST, Vazquez M. "Team Composition." in "Oxford Bibliographies in Management." Ed. R. Griffin. New York : Oxford University Press, 2019. https://doi.org/10.1093/OBO/9780199846740-0166 , Jul-2019