

Fiscal Year:	FY 2017	Task Last Updated:	FY 07/07/2017
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:	08/11/2019
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No. of PhD Candidates:	4	No. of Master' Degrees:	2
No. of Master's Candidates:	4	No. of Bachelor's Degrees:	
No. of Bachelor's Candidates:		Monitoring Center:	NASA JSC
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Flight Program:			
Flight Assignment:	NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/17/17)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Gushin, Vadim M.D., Ph.D. (Institute of Bio-Medical Problems RAS) Vinokhodov, Alla Ph.D. (Institute of Bio-Medical Problems RAS) Contractor, Noshir Ph.D. (Northwestern University) DeChurch, Leslie (Northwestern University)		
Grant/Contract No.:	NNX16AQ48G		
Performance Goal No.:			
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<p>Task Description:</p>	<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 conducting a 3-year research program in which we leverage existing data previously collected in the Mars 105 and Mars 500 simulations; collect new data using analog-definition research in the 2017 and 2018 Human Exploration Research. Analog (HERA) campaigns; and use 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>
<p>Rationale for HRP Directed Research:</p>	<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 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>
<p>Task Progress:</p>	<p>To address our research aims, we are conducting a 3-year, multi-method research effort, in which we: (a) refine an initial model and prepare for data collection in HERA (Phase I); (b) Collect data in 2017 and 2018 HERA campaigns at the Johnson Space Center (Phase II); and (c) Analyze HERA data including text mining, relational event modeling, coevolution statistical approach validation of the PSPA, and benchmarking of HERA data alongside data from Mars 105 and Mars 500 (Phase III).</p> <p>Our project began with a working meeting located at IBMP in Moscow, Russia. Drs. Vinokhodova and Gushin hosted Drs. Bell, Contractor, and DeChurch, along with research assistants and other parties in the Fall of 2016. Our working group was a time to meet one another in person, share ideas, become familiar with different approaches used, discuss our working model and HERA protocol, and for US researchers to be trained on the PSPA. The visit was extremely useful and brought greater understanding to how IBMP and NASA can work together to make significant significant progress in the study of teams in ICE. Our efforts will result in research products critical to closing Team Gaps 1, 4, and 8.</p> <p>In our first year, we analyzed Mars 105 and Mars 500 data, created a working process model of interpersonal relationship formation in ICE, and developed a protocol for data collection in the 2017 Human Exploration Research Analog (HERA) campaign (Campaign 4). With the completion of Phase I, Phase II is currently underway. Phase II is analog-definition research in which we will empirically test our model; it is the primary thrust of this research. High resolution data are collected over multiple timepoints within a 45-day isolation protocol, which allows us to utilize relational events modeling for our primary analyses.</p> <p>We started data collection in HERA at the Johnson Space Center, and have successfully completed data collection for the first mission. In Phase II, we will continue to collect data in the current HERA campaign, finalize our 2018 HERA protocol, and provide a tech report describing preliminary results with HERA 2017 data.</p>
<p>Bibliography Type:</p>	<p>Description: (Last Updated: 02/15/2024)</p>
<p>Awards</p>	<p>Bell ST. "Named one of the top 10 Chicago women in science by Make it Better Magazine, December 2016." Dec-2016</p>
<p>Significant Media Coverage</p>	<p>Winsborough DW, Chamorro-Premuzic T. "Personalities, Not Just Skills. Quotes from an interview with Bell about the NASA research." Harvard Business Review, January 25, 2017. Retrieved at https://hbr.org/2017/01/great-teams-are-about-personalities-not-just-skills, Jan-2017</p>