

Fiscal Year:	FY 2014	Task Last Updated:	FY 10/13/2014
PI Name:	Buckey, Jay C. M.D.		
Project Title:	Autonomous Behavioral Health Countermeasures for Spaceflight		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	NSBRI--Neurobehavioral and Psychosocial Factors Team		
Joint Agency Name:	TechPort:	Yes	
Human Research Program Elements:	(1) HFBP :Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	(1) Bmed :Risk of Adverse Behavioral Conditions and Psychiatric Disorders		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Comments:	Address updated 9/2008		
Project Type:	GROUND	Solicitation:	2013 HERO NNJ13ZSA002N-Crew Health (FLAGSHIP & NSBRI)
Start Date:	06/01/2014	End Date:	05/31/2017
No. of Post Docs:		No. of PhD Degrees:	
No. of PhD Candidates:		No. of Master' Degrees:	
No. of Master's Candidates:		No. of Bachelor's Degrees:	
No. of Bachelor's Candidates:		Monitoring Center:	NSBRI
Contact Monitor:		Contact Phone:	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Hegel, Mark Ph.D. (Dartmouth College) Loeb, Lorie M.A. (Dartmouth College)		
Grant/Contract No.:	NCC 9-58-NBPF03801		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>The goal of this study is to enhance the NSBRI-developed suite of behavioral health countermeasures tailored for astronauts (the Virtual Space Station or VSS), by evaluating them in an Antarctic space analog setting, improving the conflict management content, incorporating an integrated behavioral health assessment, and developing an immersive virtual reality component. This study brings together a team with experience in: (a) computer-based psychological training and treatment programs (Buckey), (b) evaluation and assessment of depression treatments (Hegel), (c) conflict management training (Weiss), (d) digital communication (Loeb), and (d) space psychology (Holland). Members of the investigator team have been involved for over 10 years in the development of a suite of space-relevant behavioral health countermeasures (the VSS). The VSS programs include conflict management training, a depression treatment, and stress management modules.</p> <p>The aims of the proposed project are to: Aim #1: Customize the Virtual Space Station program for use by astronauts by evaluating the program in an isolated environment (i.e., Antarctica) and collecting detailed information on program use, including user choices, ease of navigation, usability, and acceptability. Aim #2: Modify the existing VSS program to add enhanced conflict resolution content and an integrated behavioral health assessment. Aim #3: Enhance the VSS program to include a mood enhancement system that allows users to experience immersive relaxing situations using virtual reality.</p> <p>Components of the VSS have been validated in different settings. The conflict content has been tested for usability and acceptability with astronauts, the depression content has been evaluated in an efficacy trial in depressed individuals, and the stress program has been tested in a randomized trial with business and law students. To fully customize the VSS for astronaut use, the program need additional conflict management content, enhanced content for maintaining psychosocial well-being (immersive virtual reality (VR)) and testing in a space-analog environment (Antarctica). This project directly addresses the goal outlined in the research announcement to “Modify and customize for astronaut use a clinically validated suite of products that will determine the need for, and autonomously administer, behavioral health countermeasures. In particular these modules should facilitate conflict resolution and promote psychosocial well-being.”</p> <p>The project impact would be reducing the risk of mission failure due to psychological and interpersonal problems. The use of VR also has the potential to strengthen the conflict content, and to expand the stress management offerings. Currently, the conflict management conflict includes a simulated interaction with another crewmember. Interactions like these could be more immersive, and potentially more effective, by using VR. Additionally, VR offers the ability to provide immersive, natural environments that could be useful for relaxation, stress reduction, and attention restoration.</p> <p>Long duration spaceflight can challenge any individual’s psychological well-being. Factors such as confinement, under- or over- work, sleep loss, and monotony can combine to worsen interpersonal tensions or even lead to frank depression. Conflicts can arise with ground control with a resulting loss of trust and teamwork. A chronic dispute between or among crewmembers can destroy team functioning and lead to errors or lack of situational awareness. In the past, a variety of psychological and interpersonal events have occurred in both space and Antarctica, and these events have had a major impact on the missions.</p> <p>Computer-based behavioral health countermeasures, such as the VSS, can provide an autonomous and confidential way for astronauts to address psychological and interpersonal issues.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	0
Task Progress:	New project for FY2014.
Bibliography Type:	Description: (Last Updated: 04/16/2019)