

Fiscal Year:	FY 2012	Task Last Updated:	FY 01/08/2013
PI Name:	Cartreine, James A. Ph.D.		
Project Title:	Countermeasure for Managing Interpersonal Conflicts in Space: A Continuation Study		
Division Name:	Human Research		
Program/Discipline:	NSBRI		
Program/Discipline--Element/Subdiscipline:	NSBRI--Neurobehavioral and Psychosocial Factors Team		
Joint Agency Name:	TechPort:	Yes	
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		
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City:	Boston	State:	MA
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Comments:	NOTE: PI moved to Brigham and Women's Hospital; formerly at Beth Israel Deaconess Medical Center, Boston, MA, per info received December 2011 (Ed.) Name change to Cartreine in summer 2008 (from Carter), per NSBRI information (11/08)		
Project Type:	Ground	Solicitation / Funding Source:	2007 Crew Health NNJ07ZSA002N
Start Date:	09/01/2009	End Date:	10/31/2013
No. of Post Docs:	1	No. of PhD Degrees:	0
No. of PhD Candidates:	0	No. of Master' Degrees:	0
No. of Master's Candidates:	0	No. of Bachelor's Degrees:	0
No. of Bachelor's Candidates:	0	Monitoring Center:	NSBRI
Contact Monitor:	Contact Phone:		
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Greenhalgh, Leonard (Dartmouth College) Beven, Gary (NASA Johnson Space Center) Hegel, Mark (Dartmouth College)		
Grant/Contract No.:	NCC 9-58-NBPF01603		
Performance Goal No.:			
Performance Goal Text:			

Some amount of interpersonal conflict is expected on long-duration (LD) space missions, whether between crewmembers or between the crew and the ground. Severe conflicts, however, can interfere with mission success and even safety.

1. THE PRIMARY DELIVERABLE IS A COUNTERMEASURE TO HELP CREWS MANAGE INTERPERSONAL CONFLICT. We have produced an interactive media intervention program to assist persons to manage real, ongoing conflicts on LD missions. This intervention is based on cognitive-behavioral therapy and is designed to help individuals to work out strategies to manage the conflict via the assistance of a coach, on computer.

2. A SECOND DELIVERABLE IS PRELIMINARY DATA ON THE USABILITY, ACCEPTABILITY, AND EFFECTIVENESS OF THE COUNTERMEASURE IN FIREFIGHTERS. We will conduct an open trial to obtain these data using fire fighters (a population analogous to astronauts) who are in an ongoing conflict. This open trial will also enable us to develop and assess our procedures and instruments for data collection, and estimate effect size, in preparation for a future randomized controlled trial. THIS APPEARS TO BE THE FIRST STANDARDIZED INTERVENTION (SELF-GUIDED OR OTHERWISE) TO BE EVALUATED FOR THE MANAGEMENT OF WORKPLACE CONFLICTS BETWEEN PEERS IN ANY INDUSTRY. This interactive media program rounds out a suite of assessment, intervention, and training tools for long-duration flyers, all accessible via a single portal: the Virtual Space Station (see Carter et al., 2005). Other major resources in the Virtual Space Station developed through NSBRI support include an intervention for depression, an intervention for chronic stress, and self-assessment of depression and conflict with tailored feedback.

Year 3 has involved the production and completion of the interactive media program for conflict intervention, which included these major activities: 1. Scriptwriting, 2. Storyboard Development, 3. Media production, 4. Programming, 5. Debugging. The year has been tremendously busy and productive on all of the above fronts; each of which have posed their unique academic, intellectual, organizational, and administrative challenges. Additionally, we have continued to maintain contact with the Houston Fire Department, the Phoenix Fire Department, and the San Diego Fire Department. The program will be evaluated at these sites during Year 4.

UNIQUE ASPECTS OF THIS STUDY:

1. This software appears to be the FIRST COMPUTER-AUTOMATED BEHAVIORAL INTERVENTION THAT TAILORS THE INTERVENTION COMPONENTS TO THE USER'S NEEDS. Prior computer-automated treatments have provided the same clinical components to all users, without regard to whether the user needed them or not. This makes our intervention highly tailored to the unique status of the individual and also highly efficient, since users are only presented with content that is applicable to them.

2. TAILORING THE PROGRAM TO USERS FOLLOWS A UNIQUE PROCESS. We have developed a set of algorithms that approximates an item-response procedure to decide whether users should receive domains of interventional content or not. Computer-adaptive testing is performed in the first intervention setting to create a treatment plan to help him or her manage the interpersonal conflict. Users answer questions from validated measures to determine whether or not a given content area will be presented to them. The assessments are only used to make a binary decision of whether a user should receive that interventional content. Once the user's responses reach a numerical threshold (or cannot reach it), the program ceases asking questions in that domain and moves to the next. This application of computer-adaptive testing technology reduces the amount of questions needed to be answered by users to tailor their treatment, making the intervention more time-efficient.

3. This appears to be the FIRST INTERACTIVE MEDIA PROGRAM EVER DEVELOPED TO ASSIST PERSONS TO FORMULATE AN ACTION PLAN TO MANAGE A SPECIFIC WORKPLACE CONFLICT.

4. The planned evaluation of the program will be THE FIRST TO EVALUATE ANY INTERVENTION FOR CONFLICT BETWEEN CO-WORKERS ACROSS MULTIPLE SETTINGS IN ANY INDUSTRY. Current computer-delivered behavioral interventions have generally guided users through a pre-determined set of activities designed to address a presenting problem. This study advances the field of automated, computer-based interventions by tailoring the contents of the intervention—and even the clinical topics presented—to the user's needs. The conflict intervention program delivers a core set of interventions to assist users with their interpersonal conflict: problem solving, cognitive restructuring, and negotiation skills training.

In addition, a series of empirically-supported self-assessments also evaluate whether a user should receive content to improve his or her assertiveness, ability to manage anger, or empathy (the ability to understand the other party's point of view and emotional state). With this approach, the users receive content tailored to their particular needs, and they don't waste time on unnecessary content. Persons involved in intense workplace conflicts may also experience problems with sleep, anxiety, depression, alcohol abuse, stress, rumination, and others. These subsidiary problems can make managing interpersonal conflict challenging. This program incorporates empirically-supported measures of these problems to determine whether users would benefit from content on any or all of these seven topics. If so, the program provides optional content on the topic area.

Finally, to date, research on workgroup conflict has generally been phenomenological and descriptive. Despite the ubiquity of conflict between co-workers across all industries, and the potentially large costs of conflict in productivity, NO PRIOR STUDIES HAVE EMPIRICALLY EVALUATED A STANDARDIZED INTERVENTION FOR WORKPLACE CONFLICTS. We will do this in Year 4.

Task Description:

Rationale for HRP Directed Research:

Research Impact/Earth Benefits:

Workplace conflict is ubiquitous. Clearly, if effective, this countermeasure could help firefighters and other first responders. It could also be adapted for use in isolated operational environments, such as polar research stations, submarines, commercial ships, oilrigs, and underwater research stations. However, even greater value would be derived by making this and similar programs available to the public in workplaces and other settings such as secondary schools, social services offices, places of worship, military bases, prisons, public health and mental health centers, and eventually at home or in any location, through broadband Internet.

Task Progress:	The major work of Year 3 has been the scripting, storyboarding, media production, programming, and debugging of the interactive media program for conflict intervention, including the programming and debugging of all algorithms created in Year 2. This work has been done via Brigham and Women's Hospital, Dartmouth Medical School, and the Troupe Modern Media (Windham, NH). Additionally, we have partnered with a 3rd-party software company, The Paul Ekman Group LLC, to deliver emotional recognition training, as a portion of the intervention's empathy training. Dr. Paul Ekman is an international expert in training how to read facial expressions, and has developed empirically supported software to teach these skills. This software is incorporated into the conflict intervention program, for persons who require it (based on the assessment algorithms). The program is ready for evaluation, in Year 4.
Bibliography Type:	Description: (Last Updated: 02/11/2021)
Articles in Peer-reviewed Journals	Cartreine JA, Chang TE, Seville JL, Sandoval L, Moore JB, Xu S, Hegel MT. "Using self-guided treatment software (ePST) to teach clinicians how to deliver problem-solving treatment for depression." Depression Research and Treatment. 2012;2012:309094. http://dx.doi.org/10.1155/2012/309094 ; PubMed PMID: 23213493 , Nov-2012
Articles in Peer-reviewed Journals	Cartreine JA, Locke SE, Buckey JC, Sandoval L, Hegel MT. "Electronic problem-solving treatment: description and pilot study of an interactive media treatment for depression." Journal of Medical Internet Research: Research Protocols. 2012 Sep 25;1(2):e11. http://dx.doi.org/10.2196/resprot.1925 , Sep-2012
Articles in Peer-reviewed Journals	Rose RD, Buckey JC Jr, Zbozinek TD, Motivala SJ, Glenn DE, Cartreine JA, Craske MG. "A randomized controlled trial of a self-guided, multimedia, stress management and resilience training program." Behaviour Research and Therapy. 2013 Feb;51(2):106-12. Epub 2012 Nov 21. http://dx.doi.org/10.1016/j.brat.2012.11.003 ; PubMed PMID: 23262118 , Feb-2013
Significant Media Coverage	Leo RA. "Article, 'Atmospheric Disturbance,' focused entirely on Dr. Cartreine's research supported by the NSBRI, in the magazine, Harvard Medicine." Harvard Medicine. 2012 Spring;85(2)., Jun-2012