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PI Name:	Rose, Raphael Ph.D.		
Project Title:	Asynchronous Behavioral Health Treatment Techniques		
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) BMed :Risk of Adverse Cognitive or 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:			
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No. of PhD Candidates:	1	No. of Master' Degrees:	
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No. of Bachelor's Candidates:		Monitoring Center:	NASA JSC
Contact Monitor:	Contact Phone:		
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Flight Program:			
Flight Assignment:	NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/18/17)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Craske, Michelle Ph.D. (University of California Los Angeles) Wu, Peggy M.S. (Smart Information Flow Technologies, LLC)		
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<p>Task Description:</p>	<p>There are many potential challenges and dangers in carrying out human spaceflight. From a behavioral health standpoint, stress and anxiety-related problems, fatigue/sleep disturbance, and interpersonal conflict, are common problems that can arise for those working in operational environments. Such problems, if not addressed in advance via training, can potentially escalate into significant problems (i.e., anxiety disorder, depressive episode, severe sleep disturbance, or conflict) that can seriously impact performance, safety, and well-being. Furthermore, exploration missions present unique challenges to addressing behavioral health issues due to communication delays where real-time communication limitations could hamper the delivery of behavioral health support. The NASA Human Research Roadmap (HRR) identifies the following risks involved with human spaceflight relevant to Behavioral Health and Performance (BHP): “Risk of Adverse Behavioral Conditions and Psychiatric Disorders; Risk of Performance Decrements due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team; and Risk of Performance Errors Due to Fatigue Resulting from Sleep Loss, Circadian Desynchronization, Extended Wakefulness, and Work Overload.” The NASA Human Research Program Integrated Research Plan (IRP) also identified the following potential gaps in training; “BMed1: We need to identify and validate countermeasures that promote individual behavioral health and performance during exploration class missions. “BMed6: We need to identify and validate effective treatments for adverse behavioral conditions and psychiatric disorders during exploration class missions.” This proposal addresses these risks and gaps by examining and evaluating existing behavioral health techniques and determining the best practices for addressing behavioral health concerns that could arise on exploration missions.</p> <p>Our final research product will comprise several components. The main deliverable will be data from a randomized controlled trial (RCT) examining the efficacy, feasibility, and acceptability of asynchronous behavioral techniques in comparison to traditionally delivered psychotherapy (i.e., in-person) focusing on a behavioral health condition of relevance to spaceflight (e.g., stress, anxiety, depression). The behavioral health techniques examined will be evidence-based (e.g., cognitive-behavioral therapy--CBT) and will not consist of new or unvalidated treatments. The RCT will be conducted at the UCLA Psychology Clinic with high functioning participants (i.e., medical center personnel) who report current symptomatology (e.g., stress, anxiety, or depressive symptoms). The techniques examined in the RCT will be selected, in part, by conducting a comprehensive review of current standards of behavioral health practice for spaceflight, including consultation with behavioral health clinicians at NASA Johnson Space Center (JSC) and subject matter experts. We will also conduct a systematic review of the literature of behavioral health approaches, (e.g., computer-guided, bibliotherapy, smart phone apps) suitable for use in an asynchronous communication environment, in comparison to traditional psychotherapy. Based on information from our reviews and data from the RCT, we will formulate a “best practice guidelines” for addressing behavioral health issues of relevance to exploration missions where communication delays are a concern. The best practice guidelines will comprise behavioral health training and treatment that address pre-mission, mission, and post-mission phases of exploration class missions.</p>
<p>Rationale for HRP Directed Research:</p>	<p>This project will deliver a set of best-practice guidelines to NASA regarding behavioral health treatment techniques for potential future long-duration exploration-class missions. The best practice guidelines will be based on subject matter expert interviews, literature reviews, and data from a randomized controlled trial comparing web-based delivery of cognitive behavioral therapy to real-time delivered therapy among high-functioning individuals with symptoms of anxiety, depression, and/or stress. Anxiety, depression, and stress are some of the most common and costliest behavioral health conditions on Earth, but most people who need or seek treatment do not receive appropriate evidence-based care. Increased knowledge on evidence-based behavioral health treatments that do not require synchronous communication can potentially result in improved access to such behavioral healthcare for the broader US population.</p>
<p>Research Impact/Earth Benefits:</p>	<p>In the first year of the project we have accomplished the following:</p> <ul style="list-style-type: none"> • Teleconferences with NASA JSC Behavioral Health Support: We conducted individual teleconferences with all the members of the NASA JSC behavioral health support team including psychiatrists and psychologists. From these teleconferences we learned that the most likely behavioral health concern/problems to occur on a long duration mission are low-grade anxiety/ depression and stress reactions to workload, conflict, and frustration related to crew-ground interactions, family separation issues, and isolation. We also received feedback from psych support personnel on the types of resources they would like to have on a long-duration mission to help aid the health and welfare of the crew. The JSC psych support team said that having a way to monitor and provide feedback on a crewmember’s progress with a treatment program would be helpful. Any behavioral health program would also have to be engaging, succinct, and easy to follow and allow for ground support to get data that could be reviewed and used to form personalized feedback to the user. • Literature Reviews: Our UCLA team conducted extensive literature reviews addressing the literature on spaceflight and other relevant literatures (e.g., military) to assess state of current treatment approaches and most likely behavioral health problems. We also reviewed the literature on evidence-based treatment programs that could be used in an asynchronous communication environment. • Program Reviews and Evaluation: We then reviewed various programs for possible inclusion in our study. The programs had to have an evidence-based content approach, have a structured approach to treatment (i.e., clear session by session content), be succinct, engaging, and easy to follow. We also were looking for programs that have been tested on various populations including those who had low levels of symptomatology and varied backgrounds in terms of employment and education. Lastly the program had to have a transdiagnostic treatment approach so it could be used to treat anxiety, depression, or stress. We narrowed our review of 20+ programs down to 4 and individuals who were not familiar with these types of programs use and evaluate them on usability and acceptability. Based on all of our reviews we selected the Worry and Sadness program created by Dr. Gavin Andrews and his team in Australia. A fortunate synergy at UCLA occurred in that the same program has been incorporated into UCLA Depression Grand Challenge – a major and ambitious undertaking to address and eliminate the burden of depression by the end of this century. This gives us the opportunity to join with other campus efforts to bring about this treatment to the broader campus community. As part of that effort the creators produced a special and updated version of the Worry and Sadness program for US audiences and we have access to that version. • Treatment Conditions: half the sample will be randomized to the self-guided condition that will “treat” themselves on the Worry and Sadness program. The program consists of 6 weekly sessions of approximately 45 minutes each. Participants in that condition will receive weekly text and email reminders about sessions and homework practice as well
<p>Task Progress:</p>	

as feedback on their progress. They can complete their sessions and a place and time of their choosing. Half the sample will be randomized to the videoconferencing condition. Participants of that condition will receive 6 weekly “in-person” sessions delivered by advance therapists in the UCLA Clinical Psychology doctoral program and supervised by the principal investigator and matched for time and content to the Worry and Sadness Program.

- **Assessment Protocol Creation:** We have created an extensive yet efficient assessment protocols to provide us subjective and objective data on major outcomes related to anxiety, depression, stress, and factors related to those conditions.
- **IRB Protocol Creation:** We have obtained UCLA IRB (institutional review board) approval. We have also created and submitted an IRB protocol at NASA for review and approval.
- **Team and NASA Teleconferences:** We have had biweekly teleconferences with members of our team at UCLA (Co-Investigator Dr. Craske) and those located elsewhere (Co-I Peggy Wu and consultant and former astronaut Mike Foale) have provided their expertise and feedback to the formulation of our study content and procedures. We have also had monthly teleconferences with members of NASA BHP team to update them on our progress.
- **Coordination with research group at Stonybrook:** We were asked by NASA BHP to coordinate, where possible, our work with another group of researchers who are working on similar research (Dr. Adam Gonzalez team at Stonybrook Univ). Where possible we are sharing assessment protocol suggestions to create similar avenues of assessing outcome data.

Bibliography Type:

Description: (Last Updated: 02/11/2021)