DHS Coastal Resilience Center

Research Project:

Annual Project Performance Report

Covers reporting period July 1, 2016 – June 30, 2017

1. **Project Title:**

   Communicating risk to motivate individual action

2. **Principal Investigator / Institution:**

   Dr. James O. Prochaska, Cancer Prevention Research Center (CPRC), URI

3. **Other Research Participants/Partners:**

   o Additional Investigators: Dr. Andrea Paiva, CPRC, URI, Pam Rubinoff, CRC, URI.
   o Significant partner: Pro-Change Behavior Systems, Inc.

4. **Short Project Description ("elevator speech"):**

   Communicates risk to motivate action by tailoring communication to diverse populations. Participants receive individualized feedback via online coaching based on their readiness to take action, thereby encouraging them to move forward in the behavior change process to prepare and mitigate impacts of coastal storms.

5. **Abstract:**

   Efforts to communicate disaster preparedness and risk messages lead to increased public awareness. However, FEMA surveys indicate that the public today is little more prepared to respond to a disaster than it was several years ago. This conundrum reflects the axiom in the science of behavior change that increasing awareness can start the change process, but cannot sustain it; reflecting a disconnect between theory and practice. Behavior change psychology indicates that: 1) the behavior targeted for change must be clearly defined and include specific achievable actions; and that 2) behavior change is an extended process where each stage is a small step on the way to permanent behavior change. While efforts at linking behavior change and preparedness have been shown to be successful (Miletti and Darlington, 1995) it is not commonplace for most emergency managers, communicators and planners to incorporate behavior change psychology when communicating with the public.

6. **End users:**

   The direct end users of this project are coastal residents in New England, Alabama and Florida. However, to ensure the continued use of this research in practice, it will also target local, state, and Federal emergency managers, and coastal planners, who can help us identify

ways to incorporate and/or adapt the research findings to their communication programs. We are using Randomized Clinical Trials (RCTs) which include control groups that control for the effects of secular trends and a broad range of variables that can affect outcomes, like demographics and severity of risks. RCTs are the gold standard for the science and practice of behavior change, but many organizations, like FEMA, often do not have the flexibility to use RCTs in their applied programs. The CTI or Computer Tailored Intervention system is comprised of risk communications that are tailored to dynamic variables, like stage of change, decision making, and self-efficacy, that drive behavior change. Brief reliable and valid assessments allow tailoring to each individual using algorithms that support normative feedback (how the individual's responses compares to peers who progress the most) and ipsative feedback (how the individual is progressing over time). Similar CTIs have been found effective across a broad range of risk behaviors and diverse populations who are at risk. The CTIs have also been delivered across a variety of IT platforms and communication systems. Our discussions with Karen Marsh, who is the IT lead for Jackie Snelling's team will evolve into meeting with a FEMA IT POC, as we integrate our innovative texting capability into our current CTI system. The texting and other CTI messages can be translated into different languages. Our practice has been to demonstrate effectiveness of a new program and then seek resources for translating it to serve diverse populations. We have reached out to the following individuals and received several commitments to engage in our end-user team:

National - FEMA's Individual & Community Preparedness Program; NOAA's Office for Coastal Management; Chad Berginnis, ASFPM Executive Director; Kim Smail the Federal Alliance for Safe Homes)

Regional - Federal Coordinating Officer and Disaster Recovery Manager for FEMA Region 1

Rhode Island – Jessica Stimson RI Emergency Management (to be confirmed); Igor Runge of the Rhode Island Floodplain Mitigation Association Board of Directors (Chapter of the ASFPM); Elizabeth Stone RI Department of Environmental Management and the RI Executive Climate Change Coordinating Council.

7. **Unanticipated Problems:**

We experienced delays in recruiting due heavily to the budget limitations and by generating leveraged funds we were able to resolve the issue. We were able to complete the baseline data collection rapidly and were able to increase our baseline recruitment from 1,000 participants to 3,000 participants. Due to our close discussions and collaborations with FEMA and with leveraged funds we now have an investigator who is spending more time to engage more end users, like those named above.

8. **Project Impact:**

This project develops and assesses a state of-the-science and innovative disaster preparedness communication intervention program. Addressing Topic 2c (Communicating Risk to Motivate Action), it identifies and uses messages that motivate individuals and groups to prepare in advance for disasters, and to take action when disasters threaten. Participants will be linked to key information sources, such as the National Oceanic and Atmospheric Administration (NOAA), FEMA, and the project's recent Waves of Change (RIClimatechange.org) website, which is organized to help visitors move through the stages of behavior change. This proposed project will take this one step further and provide coaching by text messaging to increase efficacy of behavior change.

This computer tailored intervention identifies resident's readiness to prepare for such disasters and provides them with the tools, education, and behavior change strategies that empower them to take action on this important issue. In doing so, we focus on, and work closely with key members of the community, including governmental agencies, nongovernment organizations, and the private sector. Our innovative reliance on digital communications including texting, is directly related to FEMA Administrator Fugate's interest in the use of texting and other digital modalities to communicate information that can reach at-risk populations and increase their preparedness and mitigation behaviors (Haldeman, 2013).

The Transtheoretical Model in itself is a population-based theory, in that it reaches out to people at all stages of readiness and not just those who are most ready to take action. This is particularly important in this area since those most ready for disasters are not always the people affected most by these storms. Coastal residents who are not ready or do not see the benefits of becoming prepared are likely to suffer the greatest consequences and may require greater levels of assistance after disasters. By engaging the entire population, we are able to make larger impacts on the community and conform to the core guiding principles of the DHS Whole Community approach (Department of Homeland Security, 2014):
   (1) understanding and meeting the actual needs of the Whole Community;
   (2) engaging and empowering all parts of the community; and
   (3) strengthening what works well in communities on a daily basis.

9. Research Activities and Milestones: Progress to Date

Reporting Period 7/1/2016 – 6/30/2017	
Research Activity	Completion Date
Receive Human Subjects Institutional Review Board approval	1/31/16
Develop statistical decision rules for text-based CTIs	3/30/16
Update/customize Internet CTI for each region	6/30/16
Create TTM-based text messages	7/31/16
Program text system	8/31/16
Test text system and fix bugs	9/30/16
Recruited census-based sample of 3000 coastal residents from the Survey Sampling Company;	10/2-11/30/16
Research Milestone	
Have completed, updated CTI system including text messages ready to disseminate	9/30/16
Analyze and report data on initial 3,000 coastal residents recruited into the study	12/31/16

10. Transition Activity and Milestone Progress:

Transition Activities and Milestones: Progress to Date

Reporting Period 7/1/2016 – 6/30/2017	
Transition Activity	Completion Date
Ongoing collaborative conference calls with End-user Team	1/1/2016 – 6/30/2016
Build capacity of End-user team on TTM/CTI behavior change methods	1/1/2016 – 6/30/2016
Working with DHS & URI intellectual property offices to facilitate transition prior to making the purchase	1/1/2016 – 6/30/2016
Engage end users for collaborative input for tailored messages for texting	1/1/2016 – 6/30/2016
Ongoing collaborative conference calls with End-user Team	7/1/2016 – 6/30/2017
Continuing to engage end users for collaborative input for tailored messages for texting	7/1/2016 – 6/30/2017

Transition Milestone	
Completed one collaborative conference call with End-user Team	6/30/16
Webinar-based presentation with End-user team on behavior change methods	6.30/16
Participation of majority of targeted end-users on End-User Team for collaborative input for tailored messages for texting	6/30/16
Developed plan with DHS and URI intellectual property offices if DHS or any community want to use project's intellectual property	6/30/16
Completed two collaborative conference calls with End-user Team	6/30/17
Incorporate end user recommendations and feedback into our text messages.	7/31/16

11. Interactions with education projects: Undergraduates are coming to the University of Rhode Island for the summer from Tougaloo College. One student is a Psychology major and we are offering the student the opportunity to do a senior research project that can compare different states in their stage of readiness to adopt disaster preparedness behaviors.

12. Publications:

Mundorf, N., Redding, C.A., Prochaska, J.O., Paiva,A.L., & Rubinoff, P. (2017, in press). Resilience and Thriving in spite of Disasters: A Stages of Change Approach. In A. Fekete & Fiedrich, F. *Urban Disaster, Resilience and Security.* Berlin: Springer.

13. Tables:

Table 1: Documenting CRC Research Project Product Delivery

Product Name	Product Type	Approx. Delivery Date	Recipient or Anticipated End Users
Expertise on the FEMA Household Survey	Survey	November 2016 and April 2017	FEMA
Results	Report	Expected Year 3	FEMA and other end users
Intervention Program	Software	Expected Year 3	DHS

Table 2: Documenting External Funding and Leveraged Support

External Funding			
Title	PI	Total Amount	Source
Rhode Island Science and Technology Advisory Council Collaborative Research Grant	Prochaska	$100,000	NSF

Leveraged Support	
Description	Estimated Annual Value
Foundation funding for Pro-Change software	$15,000
Indirect funds were used to allow Pam Rubinoff to connect with end users	$4,680
Free support staff office	$3426

14. Metrics:

Metric	Year 1 (1/1/16 – 6/30/16)	Year 2 (7/1/16 – 6/30/17)
HS-related internships (number)		
Undergraduates provided tuition/fee support (number)		
Undergraduate students provided stipends (number)		
Graduate students provided tuition/fee support (number)	1	
Graduate students provided stipends (number)		
Undergraduates who received HS-related degrees (number)		
Graduate students who received HS-related degrees (number)		
Graduates who obtained HS-related employment (number)		
SUMREX program students hosted (number)		
Lectures/presentations/seminars at Center partners (number)	2	2
DHS MSI Summer Research Teams hosted (number)		
Journal articles submitted (number)		
Journal articles published (number)		
Conference presentations made (number)		
Other presentations, interviews, etc. (number)		
Patent applications filed (number)		
Patents awarded (number)		
Trademarks/copyrights filed (number)		
Requests for assistance/advice from DHS agencies (number)	2	2
Requests for assistance/advice from other agencies or governments (number)		
Total milestones for reporting period (number)	4	5
Accomplished fully (number)	4	3
Accomplished partially (number)	4	2
Not accomplished (number)		