

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #

Topic # N151-077

Strengthening Health and Improving Emotional Defenses (SHIELD)

Charles River Analytics Inc.

WHO

SYSCOM: ONR

Sponsoring Program: FNC - Accelerating the Development of Small Unit Decision Makers FY15

Transition Target: This technology will have broad applications in military as well as commercial settings where personnel are exposed to events that have a high probability of inducing stress and stress-related disorders.

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Other transition opportunities:

Psychological flexibility may be integrated into: 1) entry-level training, such as Basic School; 2) pre-deployment training curricula, such as the Infantry Immersive Trainer; 3) deployment to combat zones, administered by Combat Operational Stress Control (COSC) units; and 4) as part of re-acclimation programs at the end of a tour. In commercial settings, these solutions may be similarly integrated into existing programs or as part of daily activities.

Notes: Strengthening Health and Improving Emotional Defenses (SHIELD) is a mobile app that guides Warfighters through evidence-based methods of stress regulation, including breathing techniques, mindfulness-based stress reduction, muscle-tension body scans, and heart rate regulation training. Instruction, scheduling, and feedback are integrated with a smart watch or other sensor analyses to provide low-cost, easy-to-learn skills that flexibly integrate into existing training and exercise regimes.

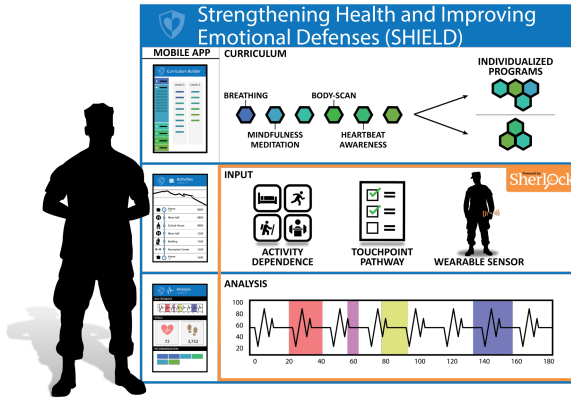


Image courtesy of Charles River Analytics

WHAT

Operational Need and Improvement: Psychological stress experienced by Marines can have negative consequences that reach beyond the individual; it affects job performance, personal relationships, and families. The inability to cope with chronic and acute day-to-day stressors, such as separation from loved ones or adjusting to the physical and mental demands of the Marine Corps, can leave individuals vulnerable to the harmful effects of stress. Teaching evidence-based strategies to promote psychological resilience before exposure to stress can mitigate its costly and often harmful long-term effects; however, existing Marine Corp programs for this training are costly, time consuming, and resource intensive.

Specifications Required: To maximize effectiveness, the Marine Corps requires a cost-effective, evidence-based psychological flexibility program that can be adaptively integrated into a variety of training approaches. This program must produce behavioral and physiological data to verify both short- and long-term effectiveness. A successful curriculum for training psychological flexibility to mitigate stress effects on Marines must meet three primary requirements: The training program must be driven by evidence and well-grounded scientific theory, while minimizing costly resource requirements. The program must collect and record stress levels using available sensor technologies to demonstrate efficacy. The program must flexibly integrate into existing Marine Corps training and exercise regimes.

Technology Developed: SHIELD is delivered within a mobile smartphone application designed to motivate Marines to set and meet their own goals (without significant external oversight), and provide a fast and easy mechanism for Marines, instructors, and commanding officers to monitor program participation, progress, and effectiveness. SHIELD instruction uses brief, self-paced instruction followed by practice that Marines can incorporate into other training, duties, and daily activities; the mobile application enables Marines to train independently.

Warfighter Value: SHIELD develops Marine psychological fitness, promoting healthy responses to adverse and stressful events. SHIELD provides: A novel, flexible training program that can smoothly integrate into a Marine's daily activities by combining components from multiple proven strategies; evidence-based stress metrics that enable comparisons across time, groups, and competing interventions, information, direction, and feedback provided through physiological sensors and contextual awareness to provide low-cost, easy-to-use physiological indicators of stress and psychological flexibility.

WHEN

Contract Number: N68335-17-C-0084 **Ending on:** August 28, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Develop psychological resiliency curriculum	N/A	Instructional videos produced featuring Marine Corps instructor	3	1st QTR FY17
Identify wearable sensors	N/A	Software integration with Garmin Fenix™ smartwatch	5	4th QTR FY17
Develop mobile application	N/A	App available for evaluation from the Google Play Store	6	2nd QTR FY19
Assess usability and efficacy	Med	Research study completed	7	2nd QTR FY21

HOW

Projected Business Model: SHIELD training does not require expert or dedicated instructors, or special hardware for sensing or intervention beyond what Marines typically possess under the USMC Bring Your Own Device (BYOD) program. Consequently, we see two approaches to transitioning and commercializing SHIELD. First, the app can be licensed and distributed directly to end users via conventional app stores. Second, the underlying technologies can be licensed to other commercial entities that will use them directly or incorporate SHIELD components as added functionality to their commercial products.

Company Objectives: Our short-term goals are to incorporate the SHIELD program within the daily routine of the Marines. We would like to work with Marine Corps Training and Education Command (TECOM) sub-organizations (e.g., Marine Corps University, Officer Candidates School, Marine Air-Ground Task Force, The Basic School) to identify appropriate strategies to effectively position our product within the Marine Corps. In the long-term, we expect the SHIELD program to have tangible benefits for Marines and Warfighters across the DoD, including the Marine RECON School, Community Counseling Centers, Defense Health Agency (DHA), and Navy Bureau of Medicine and Surgery (BUMED).

Potential Commercial Applications: Commercial applications in which these solutions are expected to be particularly effective include: disaster and crisis management, first responders, law enforcement, and humanitarian relief efforts. In particular, civilians in high stress jobs experience similar life stressors as military personnel. Therefore, we will target companies and entities in the healthcare and behavioral counseling domains, including insurance and e-health companies, as potential licensees of this technology.

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