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Walden University
2014

Abstract

Hardiness as a Predictor of Success for Marine Corps First Responders in Training

by

Jason James Bogden

Ph.D., Capella University, 2008

M.S., Central Michigan University, 2004

B.A., Thomas Edison State College, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration

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March 2014

Abstract

Military personnel and first responders operate in complex operational environments, and must be able to perform under physical, psychological, and emotional stress. Research suggests that resiliency assuages stress and improves the performance of military personnel and first responders. However, there are no studies examining the effects of resiliency on military first responders in training. The purpose of this research was to determine whether the dispositional hardiness traits of commitment, control and challenge displayed by Marine aircraft rescue and firefighting (ARFF) specialist trainees correlated to success in classroom performance, success during practical exercises, higher graduation rates. The theoretical foundation for this ex post facto quantitative study was psychological and organizational resiliency, as represented by Kobasa's hardiness theory. The convenience sample consisted of 60 Marine ARFF specialists trainees using self-report surveys during 2013. Independent samples *t* tests and hierarchical regression analyses revealed no statistical significance between higher hardiness levels and academic and practical application performance, although physical injury and other factors not measured by the hardiness construct were found to impact graduation rates negatively. The implications for positive social change include expanding organizational conceptions of resilience to measure dispositional factors not assessed by hardiness. This study may also offer insights into improving Marine Corps and first responder selection, training, and educational programs, as well as their performance and quality of life.

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Dedication

This is for my Mom and my Dad.

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Chapter 1: Introduction to the Study

Introduction

The operational and organizational environments in which Marine Corps personnel must perform are stressful. Their world is a complex one; a world filled with chaos, uncertainty, and friction (United States Marine Corps, 1997). So it is for first responders as well. To survive (let alone thrive), military personnel and first responders must be able to marshal the personal wherewithal to perform when exposed to physical, psychological, and emotional stressors (Castro, Adler, & Britt, 2006). More needs to be known about what biopsychosocial factors contribute to wellbeing and improved performance for both Marines and first responders. In order to do this, a theory and method is needed for assessment and measurement. Preferably, it would describe dispositional factors, as opposed to fixed and immutable traits; behaviors and attitudes that could be improved through training, education and practice.

One of the ways to measure individuals' health and performance under stress, that also fits the above criteria, is the concept of *resilience*. While it has been described in various and sundry ways**,** the American Psychological Association (2012), defined resilience as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress… 'bouncing back' from difficult experiences" (para. 4). It is "not a trait that people either have or do not have. It involves behaviors, thoughts, and actions that can be learned and developed in anyone" (American Psychological Association, 2012, para. 7).

If resilience is not an immutable trait, and contributes to general psychological and emotional well being and assuages the effects of trauma, new and better methods of

developing resilient attitudes, behaviors, and attributes should be identified and implemented, particularly for at-risk populations such as military and first responders. To conduct research on resilience a measure must be selected out of the many extant. One accepted measure of resilience is the psychological construct known as *hardiness*: By embodying and acting the cognitive, behavioral, and emotional attitudes of *commitment*, *control*, and *challenge*, individuals can turn stressful and potentially harmful circumstances into vehicles for personal growth (Kobasa, 1979).

Background of the Study

Upon his accession to office, the 35th Commandant of the United States Marine Corps mandated the Marine Corps:

> institutionalize resiliency training…develop policies and programs to increase individual resiliency training (and) provide the best skills and tools available to Marines and their leaders so that they can better cope with the challenges of combat and the rigor of life as a Marine both deployed and in garrison (United States Marine Corps, 2010, p. 12).

There is a decided lack of research literature exploring the mediating effects of psychological resilience on the health of Marine Corps personnel. Additionally, few studies were found examining the effects of hardiness on any population of first responders. Therefore, an examination of hardiness amongst Marine Corps first responder trainees may lead to a better understanding of how psychological resilience can maximize training and improve its quality for this population. The results of such research may have repercussions for other military and civilian populations as well.

A study evaluating the impact of hardiness on the performance of both first responders and military personnel during training is timely. Despite the believed utility of such research, few studies were found examining the effects of hardiness on either first responders or Marine Corps personnel. In a discussion of first responders and secondary trauma, Gist (2007) asserted, "For most providers in most situations, these encounters are not sources of *threat* or *loss* but are rather episodes of *challenge*, in which skills and effort central to one's personal and professional role identity are focused on the legitimate demands of the occupation" (pp. 425-426, italics in original). Hardiness, with its emphasis on commitment, control, and challenge, was well suited for a study on this topic.

While several studies examined vicarious trauma as experienced by first responders, their emphases were on prescriptive therapeutic actions (Kronenberg et al., 2008) or cognitive behavioral approaches (Gregerson, 2007). In other words, many interventions occur only once an individual sustains psychological damage. After conducting research on military personnel in various stressful circumstances, Bartone (1999) determined that mental breakdowns, including depression and posttraumatic stress, are more likely amongst the less hardy of these populations (p. 178). Despite the paucity of research on resilience and the performance of first responders (military or otherwise), many studies have affirmed the correlation between hardiness and positive outcomes for other populations in other environments. Researchers of bus drivers (Bartone, 1989), lawyers (Kobasa, 1982), and nurses (Keane, Ducette, & Adler, 1985), all supported the contention that hardiness leads to improved outcomes. It follows that a

preventative, salutary approach is more effective and efficient, not to mention more humane.

Problem Statement

It is not sufficiently known to what degree resiliency (as measured in terms of hardiness) affects successful performance of military first responders, if at all. Because both military personnel and first responders must be able to perform under stress, more needs to be known about the biopsychosocial factors affecting their wellbeing and performance in training and during military operations. Because their purpose is to engage with crises, both military personnel and first responders are at-risk groups and may undergo the very trauma they are trying to prevent and mitigate in others. Despite extensive training and experience, repeated exposure to others' trauma may lead to the development of posttraumatic stress disorder (PTSD) and other maladies. There are numerous personal, organizational, and situational factors that prevent, assuage, or exacerbate these effects (Gist, 2007). Patton and Violanti (2007) concurred and advocated specialized individual/group processes that allow planning for traumatic event exposure to facilitate prevention of or recovery from trauma.

Current Marine Corps resiliency initiatives seem to rely on palliative approaches taking place after stressor exposure. This study used the *hardiness* construct as opposed to other measures because of a proactive orientation that regards stress as a catalyst for personal and professional growth. And, as mentioned above, very few studies have examined the trauma experienced by first responders, concentrating instead on palliative approaches. No researchers examining military first responder populations and hardiness

were found. In an attempt to fill this research gap this study explored how hardiness might affect the performance of Marine Corps first responders in training.

The Louis F. Garland Department of Defense Fire Academy, located upon Goodfellow Air Force Base, San Angelo, Texas, is responsible for the training and education of one such group of first responders. Upon entry to the Marine Corps, all personnel are assigned a military occupational specialty (MOS): A group of skills and duties related to a specific vocation, which is identified by a four-digit numerical designator and descriptive title (United States Marine Corps, 2008). Marines holding the MOS of aircraft rescue and firefighting (ARFF) specialist are to "employ firefighting equipment…to rescue victims involved in aircraft crashes and to fight fires," as well as provide instruction in "the techniques and procedures of rescue and firefighting" (United States Marine Corps, 2008, pp. 3-523–3-524). Additionally, ARFF specialists assist in the full spectrum of rescue efforts, to include first aid up to the first responder level. They must be able to handle hazardous materials (HAZMAT) and be familiar with safety considerations for military aircraft (United States Marine Corps, 2008).

Purpose of the Study

The purpose of this research was to evaluate the influence of hardiness and the five-factor personality traits (*i.e.*, *Extraversion*, *Agreeableness*, *Conscientiousness*, *Neuroticism*, *Openness to Experience*) to predict the performance levels of United States Marine Corps ARFF specialist trainees. It was expected the personality and hardiness attitudes measured at the outset of training would have predictive validity in determining the success of ARFF specialist trainees, and higher hardiness ratings in particular would

presage high performance, both in the academic classroom environment and in the practical application exercises students must complete.

Because the stakes in crisis work are so great, and because the rate of failure is high, both civilian and military personnel in these occupations must be resilient and must be able to recover from environmental stresses (James, 2008). Organizations must eschew the desire for easy fixes and strive for deeper understanding of the operational environment so as to develop approaches with the requisite amount of nuance and complexity to adequately equip personnel for the rigors of the task at hand (Gist, 2007). The ability of military and first responder organizations to measure applicants' levels of resilience and use these scores as predictors of performance and opportunities for development should be cultivated.

Fruitful research on this topic would provide a meaningful contribution to both military and first responder professional development. New entrants to military and first responder professions are not necessarily homogenous, and some may be better prepared to meet the demands of these vocations. It may be advisable to screen trainees so as to determine whether they should be accepted for a given program, and if they are, whether they will need training and/or education prior to commencement of formal training. The results of this study can be used to improve the selection, training, education, and preservation of all Marines and of all first responders, both those currently serving in the United States Marine Corps and those working for civilian and other governmental agencies.

Nature of the Study

This ex post facto study used a one-stage cluster, nonprobablisitic (convenience) sampling method. Typically, two courses of up to 50 personnel run simultaneously, and as there was no need for a control group, the sample size was the entire population ($N =$ 60). Participants were asked to complete two survey instruments at the outset of their formal schooling: The 15-item Dispositional Resilience Scale (DRS15-R) was used to measure hardiness (*i.e.*, resilience). This instrument was selected over other, comparable measures, as it is brief, succinct and held to be internally consistent, valid, and possessing of good test–retest reliability (Bartone, 2007). In terms of measures of general personality traits, the amassed research has shown the five-factor model to be a valid and universally accepted measure (Thompson, 2008). Therefore, in this study personality factors were measured through the use of Saucier's (2002) self-report inventory of the minimodular markers (3M40).

The intent was not only to predict successful completion of entry-level training and high performance in the classroom and training exercises but also to discern what characteristics correlate high performance in this and other military occupational specialties, generally. The above-mentioned instruments were provided during a lull in the quotidian routine the participants underwent during training. Following course completion, the data analyses consisted of multiple logistic regressions to evaluate the performance of trainees and specifically compare graduates and nongraduates. Success was measured by academic achievement, any instructor or peer evaluations collected throughout the training, and students' performance during the course capstone practical application exercises.

After controlling for certain personality characteristics measured by the five-factor model, a statistically significant relationship between success in both classroom and practical application training environments and hardiness was the expectation. In other words, the belief was that the retroactive analysis would show higher hardiness scores predicted successful course completion and correlated with higher performance, in general.

Research Questions and Hypotheses

The choice of a methodology should be based on the nature of the area of interest, rather than the aptitudes or predilections of the researcher. Given this, and given that the phenomenon under investigation was hardiness, the research question guiding this dissertation research was: How does hardiness affect the performance of Marine Corps ARFF specialists in training? A research question that is succinct, describes a relationship between two or more variables, and is researchable (Tuckman, 1999).

A quantitative approach was required. Creswell (2009) asserted, "A theory is an interrelated set of constructs…formed into propositions, or hypotheses, that specify the relationships among the variables…Why would an independent variable, X, influence or affect dependent variable Y?" (p. 120). Accordingly, the research hypotheses for this study were:

$H_0 1$: There is not a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_1 1$: There is a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_0 2$: There is not a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

$H_1 2$: There is a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

Given the area of interest, research question, and hypotheses, the research design was an ex post facto correlational study. For the purposes of this research, hardiness and personality factors were considered to be relatively stable and were measured before the start of training. The final retroactive analyses occurred after the course was completed. This design and methodology were the most appropriate for the problem statement and research question, which require after-the-fact analyses, and the survey instruments used have been shown to be valid and reliable in previous ex post facto research on military performance (Bartone, Eid, Johnsen, Laberg, & Snook, 2009; Bartone, Roland, Picano, & Williams, 2008; Bartone & Snook, 1999).

Theoretical Base

The hardiness construct originates from research conducted at the Illinois Bell Telephone (IBT) Company in the late 1970s. It was there, during a period of organizational turmoil, that all managers experienced profound stress. However, those who displayed attitudes and behaviors consistent with the virtues of commitment, control, and challenge (*i.e.*, hardiness) were found in general to be happier and more successful (Kobasa, 1979).

From there, hardiness went on to be extensively researched in numerous studies. While none examines military first responder trainees, there were many studies that examined success in training for other types of military personnel. Bartone, Eid, Johnsen,

Laberg, and Snook (2009) assessed the effect of hardiness and five-factor model personality traits on cadets' leadership performance at the U.S. Military Academy. Using both classroom performance and practical application in the field to test the hypothesis, Bartone et al. (2009) found hardiness to be the single largest predictor of success in either environment and concluded, "personality hardiness and social judgment / social intelligence…contribute to leader performance… Along with the Big Five personality factors, these dimensions merit further active investigation as predictors of leader effectiveness across a range of occupational groups and situational contexts" (p. 34). Although it involves U.S. Army officer cadets as opposed to enlisted United States Marine Corps personnel, this approach and methodology mirror that of this study.

Bartone et al. (2008) found hardy attitudes predicted successful completion of the Army's Special Forces qualification course. Using random sample t tests and logistic regression analysis to compare graduates and nongraduates, Bartone et al. (2008) concluded that "individuals who successfully complete a rigorous Army Special Forces candidate school are significantly higher in personality hardiness than those who fail" (p. 4) and recommended "additional research (to) examine hardiness…in …other highly demanding occupations" (p. 4) so as to improve assessment and selection processes. As both first responders and active-duty military personnel, Marines holding the MOS of ARFF specialist are members of both military and first responder demographics, and as such, are of particular interest in this endeavor.

Definition of Terms

First responders: Typically, members of those professions who are the first to arrive at the scene of a traumatic event. Although the possession of a credential is not

essential (U. S. Department of Transportation NHTSA, 1999), the term is generally used to refer to firefighters, emergency medical technicians (EMTs), and law enforcement personnel. Though this term is not typically used when referencing United States Marine Corps ARFF specialists, their duties and responsibilities fit the definition of the term.

Hardiness: A personality style or cognitive approach wherein individuals demonstrating the characteristics of commitment, control, and challenge transcend stressful situations and remain healthy (Kobasa, 1979). In this study, the Dispositional Resilience Scale (DRS15-R) measured hardiness.

Posttraumatic stress disorder (PTSD): The development of persistent, negative, and unwanted physical and psychological symptoms following exposure to a traumatic incident or incidents wherein a person experiences actual or potential serious injury or death, or witnesses or learns about the death, serious injury, or threat of same, by others. Symptoms must persist for more than one month, and include vivid experiencing of the event, avoidance behaviors, psychological numbing, and increased arousal, such that individuals experience extreme stress and a marked diminishment in their ability to function (American Psychiatric Association, 2000).

Resilience: The ability to persist under adverse, stress-inducing circumstances, adapt to them while they are occurring, and/or to return to a normal or greater level of functioning after the difficult experience has passed (American Psychological Association, 2012). It is a biopsychosocial process that anyone can learn and develop (American Psychological Association, 2012).

Stress: The negative physical and psychological effects resulting from perceived environmental threats that tax or exceed one's resources and/or threaten one's well being (Lazarus & Folkman, 1984, p. 19).

Vicarious trauma: Second-hand trauma experienced due to empathic engagement with other's stressful experiences. It can be induced through direct observation, the graphic recounting of a traumatic event, or due to participation in a reenactment (Pearlman & Mac Ian, 1995). Vicarious trauma is a threat not only for first responders, but also for bystanders, therapists, and other medical personnel, amongst others.

Assumptions

It was assumed the sample for this study was representative for Marines holding the ARFF specialist MOS. At the time of this writing only 983 enlisted personnel in the United States Marine Corps are members of this profession. The one-stage cluster, nonprobablisitic (convenience) sampling method used in the selection of individuals for participation represented the entire population under examination (Marine ARFF specialist students). It was also assumed all participants contributed of their own volition (not coerced), and answers they provided were honest and truthful.

Limitations

Limitations of this study included the reactive effect: threats to external validity caused by the existence of the experiment itself rather than by the intended treatment (Tuckman, 1999). As the sample consisted of military trainees in a school environment, there was also the danger of auspices and proximity biases, especially since the researcher (a Marine Corps officer) provided the survey instruments with the explicit approval of the school's military administration and instructors.

Other reliability and validity issues may also have arisen. Ex post facto designs tend to have lower internal validity than experimental research because the independent variables are fixed and cannot be changed. The most that can be ascribed to these variables is a level of correlation (Rudestam & Newton, 2007). There are also threats to external validity if the results are used to make inferences about other individuals or scenarios, either in the past or in the future (Creswell, 2009). The inherent nature of the military training environment or the presence of an officer may render biases resistant to mitigation/elimination. Deference to rank may have caused some participants to try to furnish the correct responses (that is, responses they suspect that senior military personnel would like to see).

Incorporating the survey instruments into the administrative ebb and flow of the participants' daily routine may have mitigated some of the above-mentioned prejudicial effects. Conversely, it may have exacerbated them. The first, best way to assuage threats to external validity was through acknowledgment of this possibility at the outset. All assumptions and limitations were duly considered during this study, and every attempt was made to minimize biases.

Delimitations

Delimitations included the number of trainees who were participants in this research and the centralized geographical location of the data collection. The intent of this study was to examine the population of two courses ($N = 60$ individuals) of Marine Corps ARFF trainees at the Louis F. Garland Department of Defense Fire Academy, located upon Goodfellow Air Force Base, San Angelo, Texas. This population exists nowhere else.

Significance of the Study

In terms of positive social change, the initial belief was the findings would show that psychological hardiness had predictive validity for the successful performance of military first responders, that the knowledge gained would make training more effective and efficient, and that financial savings to taxpayers would result due to improved educational processes and a reduction in near- and long-term health care costs. The results of this study were inconclusive, with the preponderance of non-graduates and sub-par performance occurring due to factors not assessed during this study (*i.e.*, physical injury). However, the amassed literature supports the contention that both resiliency in general and the hardiness construct in particular have value for adoption by both individuals and policy makers in high-stress organizations. The researcher still believes that the inculcation of resiliency at the individual and organizational level can make personnel more effective and efficient, while improving their health and their quality of life.

More and better research is needed, and the results of this study may help improve selection, training, and educational initiatives for United States Marine Corps personnel and others in the most demanding of occupations and operational environments. It might also lead to improving the training and education process itself, not only for this specific military occupational specialty, but also for all Marine Corps personnel, by contributing to a greater emphasis on developmental rather than remedial or punitive efforts. After prescreening personnel, those needing assistance could receive training to improve their biopsychosocial disposition. Such programs already exist (*e.g.*, HardiTraining [Khoshaba & Maddi, 2005]), and the Marine Corps could adopt, adapt, or create similar initiatives.

Where applicable and feasible, these initiatives might spread to all military occupations, both in the Marine Corps and throughout the Department of Defense, thus making individuals, organizations, and society at large more resilient, thereby improving their quality of life, both now and in the future.

Summary and Transition

Resilience is important. All living things must have at least a basal level of this attribute in order to survive, much less thrive. One conceptualization of resilience (hardiness) was shown to contribute to performance, subjective feelings of wellbeing, physical health, and for both preventing and assuaging the effects of stress and trauma. New and better methods of assessing and developing resilient attitudes, behaviors, and attributes must be identified and implemented, particularly for at-risk populations such as military personnel and first responders. The purpose of this research was to evaluate the influence of hardiness and the personality factors measured to predict the performance levels of one such group, and this initial chapter was an introduction to this study on hardiness as a predictor of success for United States Marine Corps ARFF Specialists.

Chapter 2 is a comprehensive summary of the literature regarding resiliency, hardiness, the five-factor model of personality traits, first responders, stress, and the culture and personnel of the United States Marine Corps. Chapter 3 will provide a description and explanation of the methodology used to analyze data gathered through the use of two instruments: Saucier's (2002) self-report inventory, the mini-modular markers survey (3M40), and the dispositional resilience scale (DRS15-R) (Bartone, 2007). Chapter 4 will present the findings of this study, and Chapter 5 will discuss this study's

findings, provide some conclusions and suggestions for future research, and offer some

hoped-for implications for social change.

Chapter 2: Literature Review

Introduction

The purpose of this chapter is to provide the literature used to answer the research question posed in this study: How does hardiness affect the performance of United States Marine Corps ARFF Specialists in training? Resilience is an important psychological attribute, and better methods of developing hardy attitudes, behaviors, and attributes must be identified and implemented, particularly for at-risk populations. The purpose of this research was to evaluate the influence of hardiness and the personality factors measured to predict the performance levels of one such group. This chapter includes sections describing the organization, strategy, and relevance of the literature review.

Organization of the Literature Review

The literature review focused on topics thought to be germane to an investigation of hardiness in the military operating environment, most especially those encountered by Marine Corps first responders. This included research on stress, stressors for military personnel and first responders, posttraumatic stress disorder/acute stress disorder (PTSD/ASD), burnout, and vicarious (or secondary) trauma. From a review of causes and effects, the focus then shifts to the research literature regarding mitigating factors, specifically psychological resiliency in general and the construct of hardiness (Kobasa, 1979) in particular. Also provided is a section describing the nature of the organization, culture, and training processes of the United States Marine Corps. Finally, research methodologies used in similar studies were compared to those used in this research, providing justification for this study's research methodology.

Strategy for the Literature Review

The strategy used in researching the literature was an iterative one. In an effort to be exhaustive, the most current studies were located and then these were traced back to the seminal research. The intent was to find all pertinent information on the subject areas and verify the gap in the literature this study could fill.

The following databases were used: PsycINFO, PSYCHARTICLES, CINAHL, ERIC, and MEDLINE. A search of the literature on the effects of stress and trauma on military personnel produced a total of 4,044 results. When filtering for only those studies pertaining to the Marine Corps, the number of results dropped to 21. A similar search was conducted on the effects of stress and trauma for first responders. Forty-three results were found using "stress" as the sole discriminating variable. When these were filtered through the criterion of "trauma," the number of results was winnowed down to 23. Searching using the criteria of first responders and secondary trauma provided one result. No results for "vicarious trauma + first responders" were found at the time of search. Subsequently, the focus of the literature review then switched to psychological resiliency in general and the construct of hardiness in particular.

The initial search criteria were broad. These were then more narrowly focused on military and first responder populations. A particular effort was made to locate research on the effects of psychological resiliency and hardiness initiatives during training. Very few studies were found concerning the relationship of hardiness to success in first responder training. While several references examining hardiness in a military context were found, despite an exhaustive search, no research specifically using a Marine Corps population was located.

Relevance of the Literature to the Research Question

The literature reviewed was relevant and applicable to the research question: How does hardiness affect the performance of United States Marine Corps ARFF Specialists in training? The literature examined concerned the major stressors experienced by modern military personnel and by first responders, both collectively and in their respective occupational domains. Military personnel are often called upon to perform missions under unique, mission-specific circumstances that entail enormous mental and physical hardship. Similarly, first responders of various sorts must accomplish a multitude of complex tasks in challenging situations and under conditions that, while differing from those of the military, are no less stress inducing. None of the extant research examined a population of individuals who are members of both groups, individuals who may be called upon to endure the stressors of both occupations, simultaneously. This is the gap this research sought to fill. In order to remedy this absence in the literature, a broad array of subordinate topics was investigated.

Stress

The term *stress* is used in myriad ways, and definitions differ, sometimes greatly. In 1926, when articulating his general adaptation syndrome (GAS), Selye (1956/1976) described stress as an autonomic reaction wherein an organism experiencing a stressor undergoes a process of *alarm* (awareness of the stressor), *resistance* (the marshaling of resources by the organism to deal with the crisis), and *exhaustion* (wherein prolonged/repeated exposures depletes the organism). Later refinements of this theory sought to distinguish between the beneficial and maladaptive reactions to these outside influences. Stress was distinguished from *eustress*, the name given to healthful outcomes

resulting from external catalysts on an organism (*e.g.,* strenuous physical exercise). In this way it was recognized that the same stressor could elicit different responses amongst different individuals (Selye, 1975).

Later conceptions took a different stance on the relationship amongst stressor, the individual, and stress. Lazarus (1966) held that a process of primary and secondary appraisal on the part of the individual was a primary determinant in whether an outside occurrence was damaging. In primary appraisal, an organism evaluates a situation to determine whether it is merely challenging or potentially harmful. Secondary appraisal involves assessing whether resources are available to address the situation. Only when the situation is deemed threatening (as opposed to *challenging*) and the resources available to the individual are found wanting does the organism experience negative emotional (*e.g.,* fear, sadness, anger, etc.) or physical symptoms commonly thought of as *stress* (Lazarus, 1966).

For the purposes of this research, stress was defined as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well being" (Lazarus & Folkman, 1984, p. 19). Although the specific stressors faced by individuals and the relative amount of stress they subjectively feel are varied and specific to the particulars of each case, this definition highlights the universal nature of the phenomenon. One of the fundamental assumptions undergirding the concept of hardiness is the idea that all environmental influences are stressors (Maddi, 2006). Stress is a fact of life, regardless of one's vocation.

Stress in the Military Environment

Life is inherently stressful, but there are potential psychological ramifications for those in the military professions (Castro, Adler, & Britt, 2006). The inherently complex, dynamic, and uncertain nature of warfare engenders unique and profound stress (United States Marine Corps, 1997). Studies in ethology have shown that human beings, much like other animals, have hardwired biological inhibitions to hurting others of their species (Lorenz, 1963), and this, at bottom, is the *raison d'etre* of the military. War is fundamentally about human beings injuring and killing other human beings, so perhaps it is not surprising that many people find participating in this activity to be prohibitively difficult (Marshall, 1954) and stress inducing. The modern military recognizes this innate reticence, and some of the entry-level combat training that Army and Marine Corps personnel undergo exists to acculturate and behaviorally condition personnel to perform the inherently stressful action of harming other human beings (Grossman, 1996).

Acknowledgement of this stark truth goes back to the earliest written records of conflict and is of profound importance to military effectiveness, even in the modern age. Indeed, the psychological realm is held to be more important than the physical, in both in training for, and in the actual conduct of, war. Napoleon is reputed to have said, "In war the moral (*i.e.*, morale; psychological factors) is to the physical, as three is to one" (as cited in Chambers, 1999, p. 453). Those things that pertain to the corporeal realm (*e.g.,* weapons, material, and the like) though important and necessary will not alone carry the day. The psychological preparation and well-being of military personnel has been a primary concern of military and political leaders. As Shakespeare had his Henry V opine on the eve of the Battle of Agincourt, "All things be ready, if our minds be so" (Gurr,

2005, p. 31). The need to address the negative effects of stress in training so that personnel would be prepared before they occurred is remarked upon elsewhere, in the classics texts of modern warfare. Clausewitz (1976/1832), in his seminal work *On war*, warns of junior soldiers who, due their relative lack of experience, will regard their normal human reactions to conflict as personal moral failings, if not adequately prepared for the stressors of war beforehand.

Well-designed and implemented training and education can provide this preparation. In military life, risk and stress are inevitable, and as risk increases, so the relative level of perceived stress on the part of individuals tends to rise as well. However, incremental exposure to stress during training beforehand can help assuage the impact of real-world stressors and allow individuals to function effectively despite profound feelings of fear and anxiety (Donnithorne, 1993). Good training of this sort serves as an inoculation against the stressors that will inevitably arrive.

Training is necessary, but it is not always sufficient. There is the question of nature versus nurture. Some believe that combat provides stark differentiation between those who can adapt to the stress of interpersonal violence and those who cannot (Grinker & Spiegel, 1945), while others insist that breakdowns due to combat trauma can happen to anyone. Indeed, Lord Moran (1967/1945) insisted that, given the right conditions, over a long enough time line, it *will* happen to everyone. While small doses of stress have been observed to improve performance in military personnel, excessive stress is detrimental, and military leaders must take care that they do not unduly tax those in their charge (Donnithorne, 1993). Leaders and policy makers need to ensure that any ersatz cures are not, in and of themselves, harmful.

Descriptions of emotional distress during wartime can be found as far back as one can look. In tracing the history of military psychiatry, the term *nostalgia*, first recorded in the 1600s, was the name given the symptoms expressed by European conscripts assumed to be pining for their home countries, or otherwise mentally unbalanced (Rosen, 1975). Allusions to somatic symptomology in the absence of overt trauma were recorded during the Napoleonic Wars. The afflicted were thought to be suffering from "cerebro-spinal shock" due to near misses of projectiles or (more pejoratively) "wind contusions" (Jones & Wessely, 2005, p. 2). Later instantiations of the same phenomena were called by various names in various places.

Some contend that modern warfare, with all its attendant horrors, began with the United States Civil War (Binneveld, 1997), and here again, nostalgia was the term used to describe the psychological malaise observed in battlefield veterans. However, it appears the medical community of the time lacked both the interest and the theoretical depth to address the issue (Binneveld, 1997). All of these terms were used to describe a similar constellation of symptoms later given the name "battle exhaustion" during World War II (Jones & Wessely, 2005). Regardless of the terminology, it is worth noting that these maladies were routinely regarded with a jaundiced eye by the medical professionals of their respective time periods.

This lack of development continued until the first casualties of World War I. As early as 1914, the psychiatric literature collectively referred to a range of symptoms using the term "shell shock" (Copp & Humphries, 2010). This term came about as a result of the later disputed hypothesis that observed symptoms were due to cerebral damage brought about by exposure to artillery barrages (Binneveld, 1997). Nonetheless, the sheer

scope of the problem led to its belated recognition of the phenomena, even if it was not fully understood (Jones & Wessely, 2005). New theories came about that gave primacy to the reactions of the mind of military personnel to the horrors of war, including such diagnostic terms as "trench neurosis," "gas neurosis," and "buried alive neurosis" on the British side, and "*Kriegsneurosen*" ("war neuroses") on the German front (Binneveld, 1997, p. 87).

Many military medical authorities of the time subscribed to the notion that the onset of these symptoms was due to some underlying, preexisting mental defect or personality flaw on the part of the afflicted. The observed symptoms were thought to be due to the power of suggestion or a manifestation of unresolved issues in the sufferers' unconscious mind (Binneveld, 1997). Few prevailing theories laid the blame on war trauma and the stressors found in combat.

Posttraumatic Stress Disorder and Acute Stress Disorder

Despite being given short shrift in the early years of the 20th century, the psychological effects of combat and its associated traumas have long been recognized. When viewed through a certain lens, the epic poem *The Iliad* can be read as a cautionary tale about what combat trauma can do to an individual. Shay (1995) asserted that the violent tragedy that ensues due to Achilles's anger and guilt at the loss of his foster brother, second-in-command, and best friend, Patroklos is a surprisingly accurate depiction of posttraumatic stress (PTS). Even though we have lacked a deep understanding of causes or an adequate terminology, the discussion about how to deal with the repercussions of war is an old and enduring one.

To describe transitory states of psychological stress evinced by catastrophic events such as war, the first *Diagnostic and Statistics Manual (DSM-I)* included the term "gross stress reaction" (American Psychiatric Association, 1952). This term (and its inherent optimistic outlook about the temporary nature of the affliction) remained in the lexicon, relatively unchanged, until 1968 (Binneveld, 1997). It was only after the deluge of cases during and after the Vietnam era that the medical community reconsidered this position. In 1980, the term PTSD was included in the DSM-III (American Psychiatric Association, 1980). This included acknowledgement that those who experienced trauma could manifest symptoms many years after the initial incident, and that the afflicted include victims of accidents, disasters, and all manner of assaults (Binneveld, 1997).

PTSD manifests via a wide range of unwanted, recurring symptoms, including "recurrent and intrusive distressive recollections (and) dreams of the event," "acting or feeling as if the traumatic event were recurring," and "intense psychological distress at exposure to internal or external cues that symbolize or resemble exposure to the traumatic event" (American Psychiatric Association, 2000, p. 468). These symptoms lead to a shortening of normal human responsiveness and to the adoption of maladaptive coping strategies, such as a lack of commitment or avoidance, as demonstrated by,

> markedly diminished interest or participation in significant activities…feelings of detachment or estrangement from others…sense of a foreshortened future…difficulty falling or staying asleep, irrationality or outbursts of anger, difficulty concentrating, hypervigilance, exaggerated startle response. (American Psychiatric Association, 2000, p. 468)

The term PTSD is not unchanging nor without controversy. In PTSD, the individual continually relives the traumatic instance (Binneveld, 1997). What is problematic is that the current definition requires that the symptoms be pervasive for over 30 days. In order to formally recognize sufferers who have yet to reach this time threshold, in 1994 the American Psychiatric Association introduced the term acute stress disorder (ASD), the definition of which includes all of the same symptoms of PTSD, the primary difference being one of duration. According to the *DSM-IV-TR* (American Psychiatric Association, 2000), with ASD, "the disturbance lasts for a minimum of 2 days and a maximum of 4 weeks and occurs within 4 weeks of the traumatic event" (p. 472).

Given the word's connotations, Shay (2004) protested against the use of the term *disorder*, arguing that it belittled psychological battery in comparison to that of the physical. He insisted, "When a military service member's arm is shot off, do we say he or she suffers from Missing Arm Disorder? That would be ludicrous…the diagnostic entity we now call Posttraumatic Stress Disorder is an *injury* [emphasis in original], not a malady, disease, sickness, illness, or disorder" (Figley & Nash, 2007, pp. xvii–xviii). The fact that PTSD often appears in conjunction with other psychosocial and physiological afflictions supports his contention. Family issues, divorce, alcoholism, chronic unemployment, are prevalent amongst sufferers, and family members/significant others of the injured are themselves at risk for secondary trauma, depression, and emotional and physical abuse (Binneveld, 1997). Shay (2002) made the case that training and deploying military personnel as depersonalized and interchangeable parts (as opposed to members of cohesive units) all but ensures returning veterans will have problems reintegrating into

peaceful society. Once again, there is an call for preventative, salubrious training before exposure to wartime stressors.

Stressors come in many forms, and modern military operations are not binary affairs. They proceed through stages of growth and maturation, oftentimes in a non-linear fashion, and can vacillate wildly in terms of their nature and intensity. This can affect the nature of the stressors experienced by military personnel. Not only can the negative effects of stress appear well before the onset of actual physical violence, many of the stressors experienced by Marine Corps personnel have nothing whatever to do with combat. For instance, during the predeployment phase wherein personnel are preparing to leave the United States and enter the operational theater, family issues, finances, childcare, and a general aura of uncertainty, all contribute to an ongoing state of anxiety, if not outright fear (Lawhoorne & Philpott, 2010).

The type, severity, and duration of stress experienced by military personnel can also vary according to the particulars of the operational environment (Castro, Adler, & Britt, 2006). While in low-intensity conflict there is reduced instance of immediate or severe bodily harm, fear and anxiety are still pervasive on a low but continuous level. Extreme work conditions and perseveration on potentially harmful incidents can lead to emotional and behavioral disorders in those who are predisposed or worsen the symptoms of those with preexisting conditions (Lawhoorne & Philpott, 2010). Some may resort to substance abuse should the opportunity present itself (Jones, 1995). Guerrilla warfare tactics and terrorist attacks in the theater of operations drive stress levels up still higher. To be on the receiving end of repeated hostile actions, capricious in nature, can lead to existential crises on the part of service members and cause them to question the nature

and purpose of their mission (Lawhoorne & Philpott, 2010). Such unremitting attacks prevent the human body from undergoing its natural recuperative cycle. Friendly fire or instances where military personnel inadvertently injure or kill team members are particularly psychologically damaging and are harder to accept and contextualize after the fact, which exacerbates trauma and hinders recovery (Lawhoorne & Philpott, 2010).

Much also seems to be out of the control of the individual. Societal and cultural factors, such as the prevailing morality, affect both the individual's ability to heal and reintegrate as well as influence the nature of the pathology or maladaptive response to stressors. Moral judgments about afflicted personnel may be inevitable, and these are also traumatizing (Jones & Wessely, 2005). Shay (1995) stressed that societies that send their citizens to war have a moral obligation to prepare these individuals through the provision of proper training, equipment, and leadership. There must be a concerted effort to engender unit cohesion, avoid violations of societal norms, and to resist demonization of the enemy. Most especially, the military organization must overtly acknowledge the grief experienced by service members and allow for communal sharing of grief, and catharsis (Shay, 1995).

Friedman (as cited in Sherman, 2005) rejected descriptions of PTSD as resulting from abnormal circumstances, stating that such traumatic events are not out of the ordinary, but common, noting that approximately "50 percent of the American population (are) exposed in their lifetime to such traumatic stressors, with the estimated lifetime prevalence of PTSD among adult Americans at 7.8 percent" (pp. 124-125). This theme is accord with the findings with the literature on hardiness. As Maddi (2007) pointed out, "The conceptual stance that led to hardiness research emphasized that stressful

circumstances are en endemic part of living, and hence, that courage is needed if one is to

grow and develop, rather than to deny and avoid" (p. 61). In their hardiness research,

Bartone, Barry, and Armstrong (2009) provided a comprehensive accounting of the

stressors faced by modern military personnel (see Table 1).

Table 1

Primary Stressor Dimensions in Modern Military Operations

Stressor	Characteristics
1. Isolation	Remote location
	Foreign culture and language
	Distant from family and friends
	Unreliable communication tools
	Newly configured units, do not know your coworkers
2. Ambiguity	Unclear mission or changing mission
	Unclear rules of engagement
	Unclear command or leadership structure
	Role confusion (what is my job?)
	Unclear norms or standards of behavior (what is acceptable here and what is not?)
3. Powerlessness	Movement restrictions
	Rules of engagement constraints and response options
	Policies preventing intervening, providing help
	Forced separation from local culture, people, events and places
	Unresponsive supply chain – trouble getting needed supplies and repair parts
	Differing standards of pay, movement, behavior, etc., for different units in the area
	Indeterminate deployment length – do not know when we are going home
	Do not know or cannot influence what is happening with family back home

(table continues)

Table 1 (cont.)

Primary Stressor Dimensions in Modern Military Operations

Stressor	Characteristics
4. Boredom (Alienation)	Long periods of repetitive work activities without variety
	Lack of work that can be construed as meaningful or important
	Overall mission or purpose not understood as worthwhile or important
	Few options for play and entertainment
5. Danger (Threat)	Real risk of serious injury or death, from:
	Enemy fire, bullets, mortars, mines, explosive devices, etc.
	Accidents including "friendly fire"
	Disease, infection, toxins in the environment.
	Chemical, biological, or nuclear material used as weapons
6. Workload	High frequency, duration, and pace of deployments
	Long work hours and/or days during the deployments
	Long work hours and/or days in periods before and after deployments

Note. From "To build resilience: Leader influence on mental hardiness," by P. Bartone, C. Barry, and R. Armstrong, 2009, *Defense Horizons, 69*, p. 2. Copyright by Bartone, Barry, and Armstrong (2009). Adapted with permission of the authors.

Individual and Organizational Factors

Some research casts doubt on the ability of training and organizational structure to prepare emergency personnel (first responders) for their duties or to protect them from the negative psychological impact of occupational stress (Paton, 1990). Some have searched for biological factors that enable some in these vocations to not only survive, but also thrive. Bonne, Neumeister, and Charney (in Ursano & Norwood, 1994), noted medical research indicating individuals with higher levels of neuropeptide Y appeared to a have a decreased incidence of PTSD, and stated,

Resilience is defined as the capacity to withstand extreme stress or trauma without developing pathological symptoms. Current research has involved extensive study of PTSD and attempts to identify vulnerability and risk factors, but no investigations of resiliency have been undertaken. Methodologically sound research of resilience is complex and would ideally entail a prospective investigation of individuals before trauma. Given the obvious difficulties in carrying out such studies, recent research has included investigations of persons in high-risk, trauma-exposed professions, such as army personnel (particularly members of elite units), firefighters, police officers, and emergency medicine personnel. (pp. 3–4)

Identifying causative traits in resilient practitioners of high-risk vocations is difficult. An examination of new Australian police officers found little difference, beyond slightly higher scores for extraversion (Burke, Shakespeare-Finch, Paton, & Ryan, 2006). However, personnel who experienced trauma prior to joining law enforcement, and who subsequently experienced stress-inducing incidents, displayed higher post-incident functioning when using interpretive cognitive behavioral approaches (Burke, Shakespeare-Finch, Paton, & Ryan, 2006). This is similar to some of the findings of the seminal hardiness research conducted by Kobasa (1979).

Dispositional factors may not be the most significant portion of the stress/stressor equation. Also, in terms of helping and protective occupations, traumatic events might not be primary, or even significant, stressors. One study on entry-level law enforcement personnel found that while both traumatic events and organizational stressors had a deleterious effect on junior officers; the latter stressor had the more pronounced impact,

to include exacerbating existing PTSD (Huddleston, Stephens, & Paton, 2007). Paton and Burke (2007) maintained traumatic events are a catalyst for positive change provided there is the *a priori* development of appropriate cognitive orientations at the individual, unit, and organizational levels that recognize the inevitability of challenging incidents, but extracts meaning from them, and uses them for personal and organizational growth.

In their exploration of the history of the horrors of war experienced by military personnel, Jones and Wessely (2005) echoed Moran (1967/1945), and state psychological trauma is nigh-well inevitable given the right circumstances, and that both screening for suitable personality characteristics before selection, and treating injured personnel afterward through traditional psychological therapies afterward, will not be particularly effective. Attempting to codify one ideal set of inborn personality traits for prospective members so as to prevent future trauma is likely Pollyanna.

Combat-related trauma has some unique characteristics due to the nature of the violence experienced, and the culture in which it occurs. The *Psychological First Aid Field Operations Guide* (Brymer, Jacobs, Layne, Pynoos, Ruzek, Steinberg,… Watson, 2006) recommended mental health personnel employ several actions following traumatic incidents, including early engagement, the provision of physical and emotional comfort, information, and social support. This approach must be individual-centric: "Providers should be flexible, and base the amount of time they spend on each core action on the survivors' specific needs and concerns" (p.19). There are substantial personal and cultural barriers that combat veterans encounter when seeking and engaging in treatment for combat-related psychological disorders, however.

These barriers include stigmatization. Greene-Shortridge, Britt, and Castro (2007) reported that while the incidences of PTSD are high, servicemembers remained less apt to discuss psychological problems, as opposed to strictly medical (read: physical) problems. In some cases, the afflicted were seen as fundamentally weak, or it was insinuated that commissioned officers should possess the mental fortitude to bring about their own recovery (Langston, Gould, & Greenberg, 2007). The overweening majority of those testing positive for PTSD were reluctant to admit that they have a problem or seek help, fearing that others will see them as malingerers, or objects of fear or pity (Greene-Shortridge, Britt, & Castro, 2007).

Current PTSD treatments tend to emphasize therapy (especially cognitive behavioral approaches) and drugs, although these are not universally successful. Single-session forced debriefings and discussions also seem not to be helpful (Langston, Gould, & Greenberg, 2007). Research indicates that front-line treatment is paramount and must adhere to the maxims of proximity, immediacy, and expectancy (Langston, Gould, & Greenberg, 2007). The organizational climate is vital. Any program should be made as amenable to commanders as possible in order to facilitate adoption. The direct involvement/intervention of leaders and the institution of organizational policies and programs to increase awareness and reduce stigma can form a beneficent circle. Less organizational stigma leads to increased help seeking, and acquiring help decreases belief in the stigma. In order to avoid exacerbating the inevitable trauma that will occur, it is vitally important that military cultures recognize this truism, and implement policies and procedures accordingly. This long-term remedy is conceptually simple, but difficult to implement.

Work-Related Stressors for First Responders

Like military personnel, first responders risk exposure to extreme stressors throughout their professional lives. Those who work on the front line of major disasters often bear the brunt of the trauma, being doubly afflicted: both by the traumatic incident and also by vicariously experiencing the negative psychological repercussions they are trying to assuage or mitigate in those in their care. First responders often witness human suffering, grievous bodily harm, and death (DeWolfe, 2000). Repeated exposure can result in psychological and physiological effects, to include depression, anxiety, cognitive impairment, decreases in work productivity and effectiveness (DeWolfe, 2000), and burnout.

Burnout

According to Maslach (1982) *burnout* is:

a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment…among individuals who do 'people work'…a response to the chronic emotional strain of dealing extensively with other human beings, particularly when they are troubled or having problems…what is unique…is that the stress arises from the *social* interaction between helper and recipient. (p. 3)

As an individual begins to feel the effects of burnout, they may engage in a range of maladaptive coping mechanisms. Maslach (1982) found that these caregivers attempt to extricate themselves from the stressful situation, practice avoidance, and become emotionally distant. Another identified symptom is *depersonalization*: Unremitting stress engenders resentment on the part of the caregiver, causing them to become callused and inured to their suffering. If left unchecked, this negative outlook can turn inward, impact

the caregivers' sense of self, and lead to feelings of reduced personal accomplishment and depression (Maslach, 1982).

Vicarious or Secondary Trauma

Another potential stressor experienced by first responders is *vicarious* or *secondary trauma*. Originating in the work of McCann and Perlman (1990), the term was coined to describe the rapid onset of negative thoughts, feelings, and symptoms experienced by therapists who deal with victims of traumatic experiences. Also known as *compassion fatigue* (Figley, 1995; Figley, 2002) or *secondary traumatic stress* (Stamm, 1997), vicarious trauma differs from burnout in that symptoms are immediate, pervasive, can involve intrusive imagery, impact trust and intimacy issues, and affect the caregivers' ability to perform (Jordin, 2010). While originally used exclusively to refer to the cognitive, emotive, and behavioral reactions of therapists, it later came to be applied to a variety of groups of individuals working with traumatized individuals (Saakvitne, Gamble, Pearlman, & Lev 2000) and at-risk groups including first responder and humanitarian aid workers (Shah, 2010).

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Resiliency

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The preponderance of early research on resiliency comes from the field of childhood development, and here the term is generally used in reference to individuals who experience healthy, positive growth while living in environments that put them at risk (Lepore & Revenson, 2006). In her research on childhood development, Killian (as cited in Pharoah, 2004) asserted that a comprehensive definition of resiliency is problematic. She pointed out that confusion remains as to whether resiliency refers to a beneficial outcome, a skill or capacity, a process of adaption, or a combination of

personal and environmental factors, and whether it represents a pre-existing condition, one that comes into being at the point of crisis, or later (p. 42).

As stated previously, the American Psychological Association holds that resiliency is "the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress… 'bouncing back' from difficult experiences" (American Psychological Association, 2012, para. 4). Bonnano (2004), however, claims that resiliency, while more commonplace than is sometimes thought, is different from simply "bouncing back," and "distinct from the process of recovery, and can potentially be reached by a variety of different pathways" (p. 26).

Regardless of its composition, the presence or absence of resiliency cannot be reduced to strictly individual factors. Organizations and environments also contribute. Lepore and Revenson (2006) observed that resiliency is more prevalent in those organizations that promote physical/mental health, normative development, and social cohesion and the development of social capital. They also maintained that resiliency is made up of "recovery, resistance, and reconfiguration" (p. 39), with the lattermost including posttraumatic growth.

Posttraumatic Growth

Posttraumatic growth (PTG) is defined as a "positive psychological change experienced as a result of the struggle with highly challenging life circumstances" (Tedeschi & Calhoun, 2004, p. 1), without necessarily including a consciously undertaken search for meaning. Though not uncommon, posttraumatic growth is not universal, or necessarily separate from negative outcomes. Positive and negative effects of trauma can occur in the same individual, sometimes simultaneously (Paton, 2005).

Some contend that PTG is in fact different and separate from resiliency, as it involves transformational change (Tedeschi & Calhoun, 2004). The idea that great good can come from great suffering is not new, and can be traced back to the classics, to the works of the Greco-Roman Stoic philosophers (Sherman, 2005). In PTG theory, the posttraumatic growth ensues directly as a result of the *challenge* presented by the traumatic incident and the concomitant psychological unbalancing experienced by the individual (Paton, 2005).

Paton (2006) contends that evidence for the existence of PTG for emergency workers, law enforcement, and military is convincing, and that those in the helping professions have unique cultural and organizational circumstances that must be considered (Paton, 2006). These latter organizational factors may in fact be more important, in that they have been shown to have a greater overall influence on the presence or absence of PTG than the actual traumatic events (Paton, Violanti, & Dunning, 2000). Engendering (if not engineering) PTG for members of the protective services seems to be best accomplished through instilling individual interpretive and behavioral habits in personnel and institutionalizing certain organizational behaviors such as expectancy management, team learning, and a system of robust interpersonal support (Paton & Violanti, 2006).

Hardiness

Resiliency, both individual and organizational, can be assessed via a variety of measures. These include, for instance, *potency* (Ben-Sira, 1985) and *grit* (Duckworth, Peterson, Matthews, & Kelly, 2007), and there are other theories with similar orientations measuring similar dispositional attitudes and behaviors. One of these is *hardiness*: "a pattern of attitudes and skills that provides the courage and strategies to turn stressful

circumstances from potential disasters into growth opportunities instead" (Maddi, 2007, p. 61), grounded in existential philosophy and psychology (Kobasa & Maddi, 1977; Maddi, 2001). Given the inherent uncertainties and stressful nature of life, along with humans' deep-seated desire to find meaning in life, some posit that hardiness is a way to "operationalize" existential courage, or the ability to choose a future path that is different than those selected previously (Maddi, 2004, p. 279). That there is substantial research indicating the value of hardiness for diverse populations in differing environments supports this contention.

Hardiness for Nonmilitary Populations

Studies attesting to the saliency of hardiness encompass a variety of demographic and socioeconomic milieus. Populations studied include business people (Kobasa, Maddi & Kahn, 1982; Kobasa, et al., 1985), lawyers (Kobasa, 1982), the seriously ill (Okun, Zantra & Robinson, 1988), bus drivers (Bartone, 1989), the elderly (Magnani, 1990), athletes (Golby & Sheard, 2004; Maddi & Hess, 1992), and university students (Bartone, Hystad, Eid, Laberg, & Johnsen, 2009; Maddi, Harvey, Khoshabaa, Fazela, & Resurreccion, 2009). Hardiness was also found to protect immigrants and those who travel abroad for work from the effects of culture shock (Kuo & Tsai, 1986). Significantly, there is research attesting to its benefit for health care workers of various sorts (*e.g.*, Keane et al., 1985; Rich & Rich, 1987; Topf, 1989). While no literature could be found in regards to the potential relationship of hardiness to *military first responders*, there are a few studies examining hardiness in relation to civilian firefighting personnel. One such study examining occupational stress for firefighters found that there was a positive correlation between the presence of hardiness and the ability to tolerate

perceived stress, in addition to greater job satisfaction (Giatras, 2000). A subsequent study by Maddi, Harvey, Resurreccion, Giatras, and Raganold (2007), sought to determine whether hardiness led to improved job performance and to discern whether hardiness measurement would be of value in assessment and selection of fire service recruits. However, only the relationship between hardiness and social support reached statistical significance, perhaps due to the small sample size of participants. The authors called for further corroborative studies before claiming a definitive relationship between hardiness and success in fire service training, but held out hope that hardiness would have value in the assessment and selection process (Maddi, Harvey, Resurreccion, Giatras, & Raganold, 2007).

Since its creation in 1979, hardiness has become an accepted psychological discipline. Due to the interplay of "theorizing, research, and practice" (Maddi, 2002, p. 173), the initial attributes of commitment, control, and challenge have been supplemented by the attitudes of coping, social interaction, and self-care, and hardiness approaches have expanded from the individual to the organizational level (Maddi, 2002). As it is supposed to be a learned skill rather than inborn trait, hardiness has something to offer the field of positive psychology in terms of performance and health, and some studies showed that it appears to be more of a factor in beneficial outcomes than either optimism or religiosity (Maddi, 2006), for instance.

In terms of quantifiable benefits, research has shown a significant correlation between hardiness and positive outcomes in a variety of contexts: improved immune system response (Dolbier, Cocke, Leiferman, Steinhardt, Nehete, Schapiro,… Sastry, 2001); emotional control in athletes (Hanton & Connaughton, 2002); better peripheral

vision in football players (Rogers, Alderman, & Landers, 2003), and improved performance in rugby players (Golby & Sheard, 2003). Hardiness has shown its utility in improved decision-making for law enforcement personnel in potential deadly force encounters (Bartone, 2003) and increased retention amongst college students (Lifton, Seay, McCarly, Olive-Taylor, Seeger, & Bigbee, 2006). A study of Chinese university students not only found that hardiness improved performance but also that its effects were bolstered by the personality traits of extraversion, openness, conscientiousness, and agreeableness (Zhang, 2011).

Conversely, in a study of undergraduates facing a stress-inducing task, Wiebe (1991) found that while the presence of hardiness was correlated with lower physiological and psychological stress in male students, hardiness provided female participants no benefit, and was in fact counterproductive in some cases. Nonetheless, the amassed research suggested that hardiness is of value to many diverse populations.

Hardiness for Military Populations

There is no shortage of research on the positive effects of hardiness for military personnel throughout the range of operations, from entry-level training up to and including scenarios wherein personnel must deal with the after-effects of severe trauma. One of the first studies of hardiness in a military context was that of Bartone, Ursano, Wright, and Igraham (1989), which researched the effects of secondary trauma on U.S. Army casualty assistance workers helping family members of soldiers killed in a plane crash. It was found that, in addition to social supports, hardiness was a primary determinant in preventing the onset of psychological ills. Studies on Army reservists from Persian Gulf War show hardiness acts as a buffer for both combat stressors across

the range of military operations, and for life stressors in general (Bartone, 1999; Bartone, 2000). Hardiness appears to have utility in a variety of military training environments. A study of Israeli Army officer candidates found a negative correlation between hardiness and individuals' perceptions of stress, but was strongly correlated with objective measures of successful performance (Westman, 1990). Similarly, a study of Israeli Army recruits following months of intensive, round-the-clock training found the hardiness components of commitment and control to be directly related to overall mental well-being in both combative and noncombative scenarios (Florian, Mikulincer, & Taubman, 1995). Post-combat, an examination of former Israeli prisoners of war showed hardiness had both direct and moderating effects: The possession of hardy attributes and skills not only mitigated perceptions of the extreme stress experienced, it also engendered psychological growth (not unlike PTG) after the fact (Waysman, Schwarzwald, & Solomon, 2001). Hardy leaders amongst Norwegian Navy cadets increased cohesion and improve performance through positive role-modeling, not unlike the Marine Corps leadership motto of *Ductus Exemplo,* or "leadership by example" (Ruppert, 2003).

Shared hardship and/or "intensely personal" experiences engender teamwork and unit cohesion (Donnithorne, 1993, p. 75). The possession of personal hardiness and a sense of meaning in one's work seemed to ameliorate the negative effects of stress on military personnel during a long and difficult deployment, not only during the actual deployment, but for months after return (Britt, Adler, & Bartone, 2001). Stress, if re-contextualized by the individual, can be enriching and a catalyst for growth.

Adler and Dolan (2006) proffered a military-specific application ("military hardiness"), and found that, after controlling for depression, it mitigated stress effects in

U.S. Army peacekeeping forces both during and after deployment. A subsequent quasi-experimental study of Canadian military officer candidates showed the military hardiness approach better predicted feelings of well-being and training satisfaction (Skomorovsky & Sudom, 2011). Other studies showed more mixed results. Amongst the New Zealand military hardiness was correlated to positive outcomes, but not observed to be of value in either stress mitigation or in the creation of adaptive coping skills (Gardner & Carston, 2009).

For any military branch that hopes to maximize its potential in the increasingly complex modern operating environment, an effective assessment and selection process is vital (Sweeney, Matthews, & Lester, 2011). The best vetting programs encompass the physical, cognitive, and emotive dimensions (*i.e.*, all biopsychosocial elements) of prospective candidates. Miller (as cited in Paton, 2005), found that the self-selection and selfless attitudes of those in the protective services (*e.g.*, firefighters, EMTs, police), tended to improve their ability to find meaning in traumatic events. However, this orientation alone is insufficient in preparing individuals for all scenarios and their attendant repercussions (Paton, 2005). While necessary, desire and self-selection are not, in and of themselves, sufficient, in either military or civilian contexts.

In military organizations, the leader is, among other things, both role model and sense maker. For instance, the personal example and thorough training provided by Army Lieutenant Colonel Hal Moore was a primary factor in the survival of 1st Battalion, 7th Calvary, when surrounded by a multiplicatively larger North Vietnamese force during the Battle of Ia Drang (Moore & Galloway, 1992). His leadership was the catalyst that engendered allowed strong interpersonal connections to be forged throughout the unit.

These social supports, instilled in peacetime, were a deciding factor, once the battalion found itself in extremis (Geraci, Baker, Bonanno, Tussenbroek, & Sutton, 2011). Leader behaviors can and do foment the development of resilience (hardiness) in organizations.

In addition to the above-mentioned study of Waysman, Schwarzwald and Solomon (2001), Bartone, Snook, and Tremble (2002) found that hardiness retroactively predicted both military leader and academic performance for a West Point cadet cohort. Calling on researchers to go beyond the five factor model, the authors offered hardiness as "a promising personality dimension for predicting leader performance" in the military environment (p. 335).

A study of Naval officer cadets (Johnsen, Eid, Pallesen, Bartone & Nissestad, 2009), found that the commitment and challenge facets of hardiness had a significant relationship with transformational leadership approaches, which in turn correlated with successful leader performance overall. Furthermore, hardiness seemed to aid in the selection of military personnel for leadership positions: After controlling for age and gender, applicants who were selected for officer training were found to have significantly higher hardiness scores than non-successful applicants (Hystad, Eid, Laberg, & Bartone, 2011).

In an examination of military case studies, Bartone (2006) found that hardy transformational leaders enable hardiness to suffuse an organization in an almost viral fashion, and through sense-making and the creation of meaningful pursuits, mitigate the negative effects of stress. Questioning whether such behaviors would work in other circumstances (such as mass causalities and disasters), Bartone gave a "qualified

affirmative", although he allowed that "more focused research is certainly needed" (p. S144).

Hardiness Training

A consistent through-line in the previous research is the idea that resiliency in general, and hardiness in particular, are not inborn traits. Though some of the seminal research indicates that the presence of high hardiness scores amongst individuals (as measured by one instrument) was presaged by disruptive and stressful early lives (Khoshaba & Maddi, 1999a), hardiness comprises cognitive, emotional, and behavioral skills that can be taught, learned, and improved through effort. Maddi (2007) found that hardiness theory, in training and in practical application, was of benefit for those in demanding military occupational specialties, having led to reduced attrition, increased motivation, and improved performance and health.

The first documented use of hardiness training in the literature is found at the birthplace of hardiness itself: Maddi (1987) offered training to managers of the Illinois Bell Telephone (IBT) Company in his then-nascent approach. At the time of this writing, HardiTraining is a course of instruction whereby employees receive training via a Certified Hardiness Trainer (CHT) to develop hardy attitudes and behaviors (Maddi, 1987). When the results experienced by these volunteers was compared with members of a waiting-list control group, data show that participants experienced a demonstrable increase in positive functioning, as well as a decrease in anxiety, depression, and blood pressure (Maddi, 1987).

A subsequent study at IBT used a dual-track method wherein managers who underwent HardiTraining were compared to a similar group that utilized

relaxation/meditation or passive listening methods to manage stress (Maddi, Kahn, et al., 1998). As in the first study, managers who underwent hardiness specific training experienced a decrease in undesirable symptoms and behaviors in comparison with the latter group. Maddi (2004) holds that this method allows for the measurement and deliberative improvement of hardiness and of "existential courage" through choosing "the attitudes of commitment (vs. alienation), control (vs. powerlessness), and challenge (vs. security)" (p. 279–280). The approach has demonstrated positive effects for groups across a range of demographics and lifestyles, to include "military veterans, firefighters, and athletes in unusually stressful circumstances" (Maddi, 2008, p. 563). Maddi used a "train the trainer" approach in his hardiness course (2007). This is a methodology common to military organizations such as the United States Marine Corps, as it enables an internal instructor cadre to train many individuals, quickly, due to its decentralized nature.

Criticism of Hardiness Research and Measurements

The creation and use of the hardiness construct in research is not without its detractors. Since inception, its validity and reliability has come under question. Funk and Houston (1987) asserted that studies did not persuasively show hardiness to have a buffering effect on stress or to be anything other than the absence of neurotic behavior. Similar research by Hull, Van Treuren, and Virnelli (1987) led the authors to assert that hardiness was not a singular construct, and that, of its three constituent subscales, only commitment and control had a significant effect on individual health. Subsequent studies on validity testing of multifaceted personality measures using structural equational

modeling also indicated that challenge was unrelated to the other two subsets of the hardiness construct (Hull, Lehn, & Tedlie, 1991).

Low (1999) levied a more wide-ranging criticism of the validity of hardiness: In addition to definitional problems, a lack of construct validity, and questions as to whether hardiness is a dependent or independent variable, hardiness studies also showed gender, age, and socioeconomic biases. She conjectured the primary reasons for the enduring use of hardiness as a measurement of health were sanguine beliefs about individuals' ability for improve improvement and pragmatic considerations concerning ease of use (Low, 1999). Lambert and Lambert (1999) also echoed previous validity concerns, and decried the paucity of multicultural studies, the lack of qualitative research, and the relative lack of options in terms of instrumentation, amongst other issues. A more recent discussion of resiliency and posttraumatic growth research claims scholars have "abandoned" limited descriptive labels such as "hardy" because they project a conception of resiliency as an immutable trait (Lepore & Revenson, 2006, p. 28).

The United States Marine Corps

Founded in 1775, the United States Marine Corps is older than the nation it serves. *Title 10 of the United States Code* (U. S. Government Printing Office, n.d.) specifies the roles of each of the United States armed forces, and in it, the stated mission of the Marine Corps is to:

> provide fleet marine forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign. (p. 1934).

This statement belies the scope of Marine Corps operations. While it is the second smallest branch of the armed forces (second only to Department of Homeland Security's domestically focused Coast Guard), throughout its history the Marine Corps has shouldered a disproportionate share of the nation's combat missions. This orientation is reflected in a host of organizational slogans and maxims: *First to fight*, *America's 911 Force*, *Most ready when the nation is least ready*. From a strategic standpoint, the United States Marine Corps is, in a sense, the nation's military first responders.

The continued existence of the Marine Corps seems assured due to the esteem with which the nation's citizens hold it. Upon becoming the recipient of a widespread public outcry after attempting to disband the Marine Corps, President Truman opined that, "They have a propaganda machine that is almost equal to Stalin's" (Truman, 1950, para. 3). The Marine Corps appears to be the recipient of an inordinate amount of affection, not only because of its military successes, but also because of the attractiveness of its organizational culture, with its inherent elitism and appeals to service before self. As Krulak (1984) observed,

> in terms of cold mechanical logic, the United States does not need a Marine Corps…the United States wants a Marine Corps.…should the people ever lose that conviction - as a result of our failure to meet their high - almost spiritual - standards, the Marine Corps will then quickly disappear. (p. xv)

Like the other branches of the armed services, the United States Marine Corps is comprised of both active-duty and reserve forces. At the time of this writing, the organization numbers approximately 199,000 personnel, but is slated to undergo a reduction in force to perhaps 182,000 to 186,000 members by the end of fiscal-year 2015

(Ackerman, 2011). This is due several factors, to include a nation that seems to have grown tired of protracted violent conflict and global entanglements, as well as a long-standing fiscal crisis.

While the Marine Corps elitist orientation provides benefits to personnel, it can also have negative repercussions on their perceptions of meaning. Newly minted Marines have been observed to feel disconnected from the civilian populous from which they came, and whom they serve (Ricks, 1997). The culture clash between the military and civilian cultures, while not as high as during the doldrums of the post-Vietnam era, is still at an appreciable level.

Marine Corps Values and Culture

Any examination of a military population must first consider the particulars of its culture. This is especially so if the military organization in question is the United States Marine Corps. Some have argued that the United States Marine Corps stands apart from its sister services, in large part due to its strong organizational culture. Moskin (1992) asserts,

> The story of the U.S. Marine Corps is the story of men in battle - the story of
> individual courage - of men who risked everything to do what needed to be
> done…(They) were by no means all supermen; they had to conquer the fear that
> hides in everyone. But the *esprit* [emphasis in original] of their Corps, their code
> of comradeship, made them special and drove them on. (*Forward*, pp. 1-2)

The initiatory right of boot camp or Officer Candidates School is a transformative process: The intent is that even those citizens who serve for a single enlistment will be permanently changed by their exposure to Marine Corps culture. As Krulak (2004)

asserted, the nation believes that Marines "are masters of a form of unfailing alchemy which converts un-oriented youths into proud, self-reliant stable citizens - citizens into whose hands the nation's affairs may safely be entrusted" (p. xv).

The core values of the United States Marine Corps are *Honor*, *Courage*, and *Commitment* (United States Marine Corps, 1998). The organization defines *honor* as "The bedrock of our character…The quality, of maturity, dedication, trust, and dependability that commits Marines to act responsibly; to be accountable for actions; to fulfill obligations; and to hold others accountable for their actions" (p. 2-7). *Courage* is "the mental, moral, and physical strength ingrained in Marines to carry them through the challenges of combat and the mastery of fear…to lead by example, and to make tough decisions under fear and pressure", and *commitment* is "The spirit of determination and dedication…to achieve a standard of excellence in every endeavor…the value that…others strive to emulate" (pp. 2-7).

The motto of the Marine Corps Officer Candidates School (OCS), and therefore, by extension the motto of Marine Corps leaders, is *Ductus Exemplo*, which in (somewhat imperfect) Latin means, "Lead by Example" (Ruppert, 2003). Maddi (2002) spoke of organizations that embody hardy attributes on cultural level,

> people…will not just give lip service to their values, but, rather, will exemplify them in their day-to-day, moment-to-moment, interactions with each other… they will extend to others assistance and encouragement, thereby really functioning as a team. And when a…member exhibits the various behaviors mentioned here, others will applaud that and use as a model for their own advancement. (p. 183)

The Marine Corps culture is a warrior culture, one that gives preeminence to the martial virtue of self-abnegation; *control* of one's physical and psychological self. Here, just as in classical Greco-Roman thought, discipline is the key to a healthy and successful life. As the Stoic philosopher Epictetus observed,

> Some things are under our control, while others are not under our control. Under our control are conception, choice, desire, aversion, and, in a word, everything that is our own doing.... Make it, therefore, your study at the very outset to say to every harsh external impression, 'You are an external impression and not at all what you appear to be.' After that examine it and test it by these rules … and, if it has to do with some one of the things not under our control, have ready to hand the answer, 'It is nothing to me.' (Belliotti, 2009, p. 204)

This same orientation can be seen in the historical personages enshrined as exemplars of behavior within the Marine Corps. Epictetus (1983) is reputed to have said, "What upsets people is not things themselves but their judgments about the things" (p. 13). Vice Admiral and Stoic scholar James Stockdale spent approximately eight years as a North Vietnamese prisoner of war. Despite repeated physical and psychological torture, he claimed he was able to endure due to the lessons gleaned from the works of Epictetus, so much so in fact, that he came to view the ordeal as a transformative experience (Stockdale, 1995). As Sherman (2005), who offered Stockdale as a modern-day example of the applicability of this classical approach, stated, "both Stoics and contemporary PTSD researchers concur on the transformative power of the belief that one can carve out some domain of control even in the most constrained of circumstances" (p. 127).

Aircraft Rescue and Firefighting (ARFF) Specialists (MOS 7051)

In the United States Marine Corps, the mission of Marines holding the Primary

Military Occupational Specialty (PMOS) of Aircraft Rescue and Firefighting Specialist

(7051) is to "employ firefighting equipment…to rescue victims involved in aircraft

crashes and to fight fires", as well as "instructing personnel in the techniques and

procedures of rescue and firefighting" (United States Marine Corps, 2008, pp. 3-523–3-

524). In addition to all aspects firefighting, ARFF Specialists must also assist in the full

spectrum of rescue efforts, to include first-aid, up to and including the first responder

level. They must be knowledgeable about, and be able to handle hazardous materials

(HAZMAT) and be familiar with safety considerations for military aircraft and its

associated ordinance (United States Marine Corps, 2008). All these duties are in addition

to the war fighting proficiencies required of all Marines. The maxim "Every Marine is a

Rifleman" serves to remind Marines that combative skill is the most central characteristic

of Marine Corps culture.

Despite its inherent complexity and potential stressors, the prerequisites for this

occupational specialty are not onerous or uncommon. Before attending training, and in

addition to baseline Marine Corps fitness and appearance standards, Marines must pass a

National Fire Protection Association (NFPA) 1582 physical examination (United States

Marine Corps, 2008). Aspirants must also achieve a General Technical (GT) score of 105

or higher, and at least a 95 on the Mechanical Maintenance (MM) composite portion of

the ASVAB. Otherwise, ARFF Specialists need only to be at least 64 inches tall, and

have vision that is not less than 20/50 (correctible to 20/20) with normal color perception

(United States Marine Corps, 2008). No dispositional or psychological screening is

required. Provided they meet the above standards and school seats are available, Marines will be accepted into training.

All Marine ARFF trainees (and sister service branch equivalents) in the Department of Defense attend the Louis F. Garland Department of Defense Fire Academy, located upon Goodfellow Air Force Base, San Angelo, Texas. In addition to Army, Navy, Air Force, and Civil Service personnel, Fire Protection Specialists from several foreign countries also receive instruction at the academy (B. Henson, personal communication, December 12, 2011). Upon completion of the 13-week training, the ARFF Marine will be recognized as a Firefighter (Levels 1 and 2), Airport Firefighter (Levels 1 and 2), as well as an Emergency Medical Responder, and will also be certified for Hazmat Operations and Awareness (B. Henson, personal communication, December 12, 2011).

The program of instruction (POI) includes six "live" and/or simulator training events, comprising a total of 544 hours. According to the NAVMC 3500.45 (March 31, 2008), the training and readiness requirements are designed to inculcate a common base of core skills and combat capabilities. Compared to other Marine Corps military occupational specialties, "ARFF training is unique…because of the requirement to function in both a tactical and civilian services environment simultaneously. (It) provides a unique capability to the Marine Combat Aviation Element" (p. 4-7). At the time of this writing, there are approximately 983 Marines who hold this Military Occupational Specialty.

Research Methodology

Measurement of the Hardiness Construct

"The question 'Which scale is the most reliable and valid indicator of hardiness?' remains unanswered" (Funk, 1992, p. 335). In her seminal research, Kobasa (1979) used as many as nineteen different measures. Many of these failed to discriminate between individuals who were experiencing high degrees of illness and those who did not, and so were abandoned (Funk, 1992). A process of winnowing and consolidation led to the creation of the first singular hardiness measurement, the 71-item Unabridged Hardiness Scale (UHS) (Kobasa, Maddi, & Kahn, 1982), though it was criticized for measuring challenge via a singular subscale (Funk, 1992). It was followed shortly thereafter by the Abridged Hardiness Scale (AHS) and the Revised Hardiness Scale (RHS), with 20 and 36 items, respectively (Funk, 1992).

The development of comparable differing measurements then began. The 50-item Personal Views Survey (PVS), which evolved out of the aforementioned instruments, was the first of these (as cited in Funk, 1992). Bartone, Ursano, Wright, and Ingraham (1989) also developed an alternative measure, the 45-item Dispositional Resilience Scale (DRS). The ostensible purpose of both the PVS and DRS was to address the criticism levied upon previous measures, and in so doing, supplant them (Bartone, as cited in Funk, 1992). In part to remedy the concerns about the validity of the hardiness construct and its ability to mediate stress, raised by Funk (1992) and others, the DRS45 was subsequently modified to include 30- and 15-item measures that were shown not to sacrifice validity or reliability (Bartone, 1991; Bartone, 1995).

The popularity of the hardiness construct has led to investigations into its universality, with some positive results. A study of Norwegian version of the DRS15 showed that the measure has validity and reliability, while providing further support for hardiness both as a singular and three-pronged construct (Hystad, Eid, Johnsen, Laberg, & Bartone, (2010). Research and development of new hardiness and resiliency instruments continued down to the time of this writing. A newer, brief measurement outside the purview of either Maddi or Bartone was the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), and it showed good psychometric properties. For some, the variety of instruments for measuring hardiness could be daunting:

> Both standard and non-standard hardiness measurements continue to proliferate…it is difficult or impossible to determine which hardiness scale a researcher has used (making) the body of hardiness research difficult to interpret (and) to determine whether differences in health outcomes across studies are real or reflect differences in the hardiness scales used. (Funk, 1992, p. 336)

The Five-Factor Model ("Big Five") of Personality Traits

"A meaningful and robust model for personality attributes" (Digman, 1996, p. 16), the five-factor model of personality traits (or "Big Five") has become one of the most widely used and accepted personality measures in psychological research. Early models of human personality characteristics involved lists of hundreds of descriptive words or traits. Simpler models that were still valid and reliable were sought. Cattrell (1946) was able to reduce the observed personality characteristics previously observed in the literature to a 22-trait scale. Fiske (1949) then used Cattrell's scale to examine a

sample of 128 psychologists in training. After factor analyses based on self-reporting and the perceptions of peers and instructors, Fiske found that behavior could reliably be grouped into four common personality factors, with indications of a fifth, "confident self-expression" (p. 344). Though this was the first time that personality measures were shown to be reducible to a handful of factors, not much further research along these lines would occur until the 1960s.

Tupes and Cristal (1961) drew upon these studies, and articulated a personality measurement that distilled human variables into five characteristics. Subsequently, Norman (1963, as cited in Leary & Hoyle, 2009) built upon the work of all of the aforementioned to create the system of personality measurement later known as the "Big Five", or the five factor model (FFM) (Costa & McCrae, 1992). It included the five identified traits of *Agreeableness*, *Conscientiousness*, *Extraversion* (formerly "*Surgency*"), *Neuroticism*, and *Openness to Experience* (McCrae & Costa, 1985). It proved itself consistent regardless of the type of instrumentation used, whether in peer ratings or self-reports; leading to calls for its widespread adoption (McCrae & Costa, 1987). Later, Costa and McCrae (1992) and McCrae and Costa (1997) refined the model still further, adding a hierarchal structure wherein each of the five dimensions receive support from six subcategories.

According to Digman's analysis of the amassed literature (1996), the five-factor model was valid for all age groups and across cultures, regardless of the medium used, and is used in studies across a variety of fields, to include personnel selection (Barrick & Mount, as cited in Digman, 1996.). The trait model of personality measurement and the five factor model seemed to be universally applicable, extending across cultures,

languages, and geographical differences (McCrae & Costa, 1997; McCrae & Terracciano, 2005). Repeated studies demonstrated the statistical validity and congruency of the five factor model when analyzed in conjunction with other measures. Furnham, Moutafi, and Crump (2003) confirmed the findings of several previous investigations attesting to the congruity between the Revised NEO Personality Inventory (NEO PI-R) and the Myers-Briggs Type Indicator (MBTI), a personality measure perhaps second only to the FFM in terms of frequency of use.

This is not to say that the five-factor model was not subject to criticism. Some claimed its soundness has not been proven, and a factor analysis in one study indicated that the extraversion and agreeableness constructs were not stable, and were of questionable validity (Vassend & Skrondal, 2011). Also, the five factor model may not provide a complete solution to all questions regarding human characteristics and/or personality traits. "Much remains to be done… (D)o these broad categories of personality emerge out of temperament differences at an early age? How are they modified by early experience? To what degree can (personality traits) be increased by special training" (Digman 1996), p. 16). Note that here, just as with resilience in general, and hardiness in particular, there was some debate as to just what these traits were, to what degree they were inborn, and to what degree they could be inculcated through training.

Measuring the Five-Factor Model

Taking as a given the validity and reliability of the Big Five personality dimensions and previous instruments for their measurement, Gosling, Rentfrow, and Swann (2003) acknowledged that the length of existing measures was prohibitively long. To remedy this, the authors created 5- and 10-item instruments that, while somewhat less

effective than the long form, showed satisfactory ratings in terms of validity, test-retest reliability, and convergence between self and observer ratings.

As mentioned previously, the proposed study will ask participants to complete two surveys, one for hardiness and one for the five-factor model of personality traits: the DRS15-R and Saucier's (2002) self-report inventory mini-modular markers (3M40). This relatively short survey asks that respondents use the 40-adjective list of human traits provided to describe themselves as they see themselves at the present time, both generally and specifically, as compared to others of the same age and gender.

Summary

The aforementioned showed that the extant literature supported the proposed study. This literature review examined studies concerning the major themes regarding the stressors experienced by military personnel and first responders in general, and Marine Corps ARFF specialists in particular. Also examined was literature concerning the training these populations undergo, and the preventative and palliative effects of psychological resiliency, most especially that of hardiness. In this critical analysis, the most relevant and up to date studies on these areas of research were discussed, with an emphasis on delineating the gap in the literature that this study intends to fill. Chapter 3 will describe and explain the methodology for gathering the data for this research. Chapter 4 will present the findings of this study, and Chapter 5 will provide conclusions, and some implications both for future research and for social change.

Chapter 3: Research Method

Introduction

The purpose of this chapter is to describe the strategy and methods employed to collect and analyze the data used to answer the research question posed in this study. The following areas will be covered: the research design and approach, the setting and sample, the instrumentation, data collection and analysis, protection of participants, and dissemination of results.

Research Questions and Hypotheses

The research question guiding this dissertation research was: How does hardiness affect the performance of Marine Corps ARFF specialists in training, if at all? Derived from this were the following research hypotheses:

$H_0 1$: There is not a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_1 1$: There is a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_0 2$: There is not a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

$H_1 2$: There is a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

Research Design and Approach

The research method for this study was quantitative and used survey instruments to gather self-reported data on the dispositions of Marine ARFF specialists during their entry-level training to determine whether hardiness characteristics are correlated with

success in both academic (classroom) and operational (practical application exercises)

settings. The study asked participants to complete two surveys, one for hardiness, the

dispositional resiliency scale (DRS15-R), and one for the five-factor model of personality

traits, the minimodular markers (3M40).

Given the research topic and the nature of the organizational environment of the

participants (*i.e.*, an ex post facto examination of military personnel in a formal training

environment), a quantitative study of the sort described best answered the research

question. Time and logistical constraints were also salient. In the military environment

(and in military training environments in particular), rigid scheduling is the norm. As a

result, free time is scant. These constraints dictated that any research method impose a

minimal burden on staff, faculty, and participants. Given the size of the primary and

secondary instruments (the DRS15-R and 3M40), it was anticipated the total time

required for participants to complete them would be less than 1 hour.

The availability of a valid and reliable instrument in the form of the

instrumentation selected was also a major determinant in selecting a research method.

The use of qualitative research methods was considered. However, the hardiness

(Kobasa, 1979) attributes and the Big Five are considered personality traits, and represent

a "specific state, or condition….as determined by outside observation or judgment, or by

self-description" in an "educational environment" (Tuckman, 1999, pp. 182–183).

Therefore, the above-mentioned research design was deemed most appropriate to this

problem statement and research questions as they require after-the-fact analyses.

Generally speaking, surveys, and these surveys in particular, have been shown to be valid

and reliable in similar ex post facto research predicting successful military performance (Bartone, Eid, et al., 2009; Bartone, Roland, et al., 2008).

Setting and Sample

Population

The sample was drawn from active-duty Marines training to obtain the primary MOS of ARFF specialist (7051). As stated previously, ARFF personnel are the Marine Corps' flightline firefighters and first responders. They also instruct other personnel in these techniques and procedures (United States Marine Corps, 2008), handle HAZMAT (United States Marine Corps, 2008), and, when necessary, perform the war fighting functions required of all Marines.

Setting

The setting selected for this study was the Louis F. Garland Department of Defense Fire Academy, Goodfellow Air Force Base, San Angelo, Texas. This setting was chosen because it is the only location where the target population for this study resides.

Sampling Methods

This study used convenience sampling. The sample included all Marine ARFF trainees attending entry-level vocational training at this Department of Defense Fire Academy. The selection and eligibility criteria for study participants were straightforward: All personnel who met the above-mentioned criteria and who freely and willingly wished to participate were able to do so. Given the demographics of the population (military personnel), it was expected that all potential respondents met the age requirement (at least 18 years old) to participate in this research. There are typically 40 to 50 individuals per course, and the academy conducts two courses per calendar year. In

this research the sample was $N = 60$. Given the nature of the study, there was no need for

a control group. At the outset, the anticipated sample was the entire population (*i.e.*, all

Marine ARFF trainees from a given academic year). Given the respective sizes of the

sample and the holders of this MOS, this sample may also have statistical relevancy for

the Marine Aircraft Rescue and Firefighting Specialist population at large. At the time of

this writing, there are approximately 983 enlisted personnel who hold this primary MOS

in the entirety of the Marine Corps.

Sample Characteristics

The characteristics of the sample are expected to be relatively homogeneous, in

that all Marine ARFF trainees (and sister service equivalents) in the Department of

Defense attend their entry-level vocational training at the academy after completing boot

camp and basic combat training. (B. Henson, personal communication, December 12,

2011). While there were a few slightly more senior personnel attempting to make a lateral

move into another primary MOS, the final sample fulfilled the expectation that nearly all

study participants were in the early stages of their Marine Corps career.

Procedures for Gaining Access to Participants

Verbal approval from the commanding officer of the Marine Corps section of the

Louis F. Garland Department of Defense Fire Academy was procured. Nonetheless, once

this study's proposal was approved, formal assent from the United States Marine Corps

Institutional Review Board was obtained. In furtherance of this process, a letter was sent

to the above-mentioned commanding officer stating that the researcher is currently

working towards a doctorate in public policy and administration and is writing to request

formal permission from the Marine Corps to collect data from participants who freely and

willingly wish to participate. It also explicitly stated that the research to be conducted was undertaken solely for academic purposes. None of data gathered thereby would be used in assessing performance, and participation/non-participation would have no professional impact, either pro or con. Participation in the study would be strictly voluntary, and the survey instruments were completely anonymous. All data collected would be treated as confidential and kept in a secure location for 5 years, at which time it would be destroyed.

Methods of Establishing a Researcher–Participant Working Relationship

It was anticipated that the nature of this study would require travel to the Louis F. Garland Department of Defense Fire Academy to conduct research in person. So as to mitigate the potential for proximity and auspices biases, the researcher (an active-duty Marine Corps Officer) did not wear his military uniform nor refer overmuch to either his military or academic titles. This is because the organizational power resulting from status as a Marine Corps officer (both real and perceived) might impede frank, thorough responses to the survey questions. There was the risk that participants may have tried to respond to survey questions in ways that they believed to be acceptable by the Marine Corps hierarchy. That is, they may have tried to give what they felt to be the "correct" answers.

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Instrumentation and Materials

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The Dispositional Resiliency Scale (DRS15-R)

The dispositional resiliency scale (DRS15-R; Bartone, 2010b) was used in this research to assess the relative hardiness of participants. It consists of 15 items (6 of which are negatively keyed) comprised of simple declarative statements (*e.g.*, "By working hard

you can nearly always achieve your goals" ;"It bothers me when my daily routine gets interrupted"). The instructions that came with the purchased surveys stated there were no wrong answers. Participants were encouraged to be honest and instructed to select the best response from a 4-point Likert-type scale:

0   *Not at all true*
1   *A little true*
2   *Quite true*
3   *Completely true*

"Hardy" Characteristics Measured by the DRS15-R

Commitment. Individuals who possess this characteristic show a propensity to dedicate themselves to engaging in the full-spectrum of daily life, despite its vicissitudes, and remain determined in the face of adversity (Kobasa, 1979).

Control. Those who embody this attribute believe that they are not passive victims of fate. Rather, they remain convinced that they have the ability to make meaningful, deliberative change in their lives (Kobasa, 1979).

Challenge. Those who possess this characteristic do not invariably see change as negative or disruptive. They acknowledge that change is inevitable, and that it can be a means of personal growth when approached with the proper attitudes and behaviors (Kobasa, 1979).

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Calculation of Scores and Assessment of Meaning

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In this research, participants responded to the 15 positively- or negatively-keyed statements with one of the four Likert-type scale answers that measure the hardy characteristics of commitment, control, and challenge. Each respondent's score would

then be calculated by taking the 5 negatively keyed items, reverse scoring them, then adding up the total scores for all 15 items.

Validity and Reliability of the DRS15-R

Initially created to meet the needs of researchers who wished to use the hardiness construct, but were hampered by the lack of widely accepted measures (Funk & Houston, as cited in Bartone, 1995), the DRS15 has shown itself to be valid and reliable across a range of organizational environments, while being brief and possessing sound internal consistency (Bartone, 2007). For instance, using the DRS15 to assess a sample of 700 reserve military medical personnel deployed during the first Persian Gulf War, Bartone (1995) found that the DRS15 had Chronbach's alpha coefficients of .77 for commitment, .71 for control, and .70 for challenge, with the overall hardiness measure rated at .83. While the initial coefficient for the test-retest reliability of the DRS15 was .52 (Bartone, 1995), subsequent testing using a sample of students at the U.S. Military Academy (n=104) over a three-week period yielded a test-retest coefficient of .78 (Bartone, 2007). The version of the DRS used in this study (DRS15-R) was the most recent at the time of its use, as it incorporated the most recent research findings, affording it better balance and fewer cultural biases (Bartone, 2010a).

The Big-Five Mini-Markers Survey

The Big Five mini-markers questionnaire (Saucier, 1994) built upon the work of Goldberg (1992), and his 100-adjective marker developed to measure the five personality traits via a 20-item scale. While acknowledging that this measure is efficacious and succinct, Saucier (1994) asserted that very brief measures such as the 40-item mini-

markers survey are necessary and desirable due to the specifics of research problems,

time constraints, as well as participant and rater fatigue.

The questionnaire used to measure the Big Five personality traits (*extraversion, intellect/openness, emotional stability, conscientiousness,* and *agreeableness*) in this research was Saucier's (2002) self-report inventory mini-modular markers (3M40). This instrument asked respondents to use the 40-adjective list of characteristics provided to describe themselves as they saw themselves at that time, both generally and specifically, as compared to others of the same age and gender. Participants were instructed to write a number from a 9-point Likert-type scale beside each of the adjectives to indicate how thoroughly they embodied each trait. The response choices for the mini-modular markers (3M40) are:

1   *Extremely Inaccurate*
2   *Very Inaccurate*
3   *Moderately Inaccurate*
4   *Slightly Inaccurate*
5   *Neither Inaccurate nor Accurate*
6   *Slightly Accurate*
7   *Moderately Accurate*
8   *Very Accurate*
9   *Extremely Accurate*

The mini-markers instrument is in the public domain and is free for unlimited used without need to acquire permission from its creator (Srivastava, 2012). Nonetheless, the researcher requested and received explicit permission to use the 3M40 in this study (G. Saucier, personal communication, August 23, 2012), and also sought and received permission to include the instrument as an appendix in this dissertation.

Attributes Measured by the Big-Five Mini-Markers

Extraversion

The measurement of this attribute is derived by contrasting adjectives regarding both attitudes and behaviors. Those who score highly in extraversion are characterized by adjectives such as "talkativeness, assertiveness", while those who score lower display "silence, passivity, and reserve" (Goldberg, 1993, p. 27).

Agreeableness

This factor is a measure of contrasts between "traits such as kindness, trust, and warmth with …hostility, selfishness, and distrust" (Goldberg, 1993, p. 27). Those who score highly are deemed to be more affable and empathetic, while those who score lower tend to be perceived and distant and hostile.

Conscientiousness

Measured along a continuum that includes, "organization, thoroughness, and reliability" at one end, and "carelessness, negligence, and unreliability" (Goldberg, 1993, p. 27), at the other.

Emotional Stability

Sometimes labeled *neuroticism*, this factor is a measure of the presence and degree of such traits as "nervousness, moodiness, and tempermentality" (Goldberg, 1993, p. 27). Those who possess low scores in this attribute can be expected to appraise challenging circumstances as more threatening, and experience more anxiety as a consequence.

Openness to experience

Formerly termed *culture* (Goldberg, 1993), and sometimes labeled *intellect*, this factor is held to be a measure of respondents' relative levels of "imagination, curiosity, and experience", as opposed to "shallowness and imperceptiveness" (Goldberg, 1993, p. 27).

Calculation of Scores and Assessment of Meaning

The public domain mini-markers survey is provided with its associated varimax-rotated factor loadings of the 40 scale-items. The table uses asterisks to indicate which item corresponds to each factor. Also provided are the methods by which one can calculate scores from the responses. The intended method will be the one preferred by the survey's author, "to reflect values as appropriate, sum, then divide (for each scale) by 8 to arrive at the mean response for items on the given scale" (Saucier, 2005, p. 1). As with the DRS15-R, negatively loaded items on the 3M40 are reverse coded, then summed with those that are positively loaded.

Validity and Reliability of the Big-Five Mini-Markers Survey

An assessment of the criterion and construct validity of the mini-markers found it had good criterion validity compared to more lengthy measures, and acceptable discriminant and convergent validity (Palmer & Loveland, 2004). In addition to taking less time to complete, this instrument also had the benefit of more user-friendly terminology and both lower interscale correlations and higher inter-item correlations, without a concomitant loss of validity, although Saucier admits alpha reliability was reduced slightly (1994).

Data Collection and Analysis

Data Collection

The DRS15-R instrument and associated material were purchased from their creator, Dr. Paul Bartone, via the company KBMetrics. This purchase included both the DRS15-R survey and scoring key, as well lists of both adult and college-age normative data. For a small fee, these materials were made available for unlimited academic use for a period of one year (Bartone, 2010a). The 40-item mini-markers measure of the Big Five (Saucier, 1994) was also procured from the website of its creator. As stated previously, the latter is a public-domain instrument; no fee or permission was required for its use (Saucier, n.d.). Upon receipt of the aforementioned, the surveys were printed, and organized into participant packets that also contain the requisite consent forms and instructions for use.

This research used data collected during the military occupational specialty-granting school that ARFF Marines attend after successfully completing entry-level training (*i.e.*, Boot Camp and Marine Combat Training). The Big Five personality traits were assessed solely to determine what influence they had, as opposed to the hardy attributes, on the performance of these participants. In order to derive a full and thorough picture of these factors' effects, this study analyzed participants' scores both from the academic environment of the classroom, and the practical application field training exercises that are a prerequisite to successful course completion.

There were some concerns at the outset about using this sampling method and steps were taken to minimize these. The design and methodology of any study can result in a reactive effect, wherein external validity is threatened by the measuring of effects that occur due to the nature of the experiment itself (Tuckman, 1999). As the sample consisted of Marine Corps trainees in a school environment, there was always the danger

of auspices and proximity biases, especially as it was the researcher (a Marine Corps officer) who provided the survey instruments. Also, ex post facto designs tend to have lower internal validity than experimental research because independent variables are fixed and immutable (Rudestam & Newton, 2007).

Another potential threat to external validity would be if the results of this study were used to make inferences about other individuals and/or scenarios, either from the past or in the future (Creswell, 2009). In terms of the threat on external validity caused by unfounded inferences or conclusions, the identification of these propensities at the outset of the research and the explicit acknowledgment of them are the first, best way to assuage their effects. Auspices and proximity biases are more problematic in that the inherent nature of a military training environment renders them resistant to complete elimination. To mitigate this, the proposed study incorporated the survey completion process into periods of free time built into the ARFF trainees' daily training schedule.

As stated earlier, the intended sampling method was one-stage cluster sampling, using nonprobablisitic (convenience) sampling in the selection of individuals for participation, as the entire population was located at the Department of Defense Fire Academy in Garland, Texas (*i.e.*, in a cluster).

Data Analysis

Upon completion of the surveys, the test instruments were collected and the data therein analyzed. This data analysis portion utilized the latest version of the Statistical Package for the Social Sciences (SPSS). The data analyses consisted of random sample *t* tests and separate hierarchal logistic regression analyses to evaluate the performance of trainees, generally, and to compare the scores of graduates and non-graduates abilities,

specifically. Descriptive statistics for the sample as a whole, and separately for both graduate and non-graduate participants were also generated. The latter underwent both parametric and nonparametric testing to determine whether there were statistically significant differences between graduate and non-graduate participants in terms of hardiness levels.

Initially, there was intent to gather gender data for use as a control variable, or perhaps to determine if there were any significant differences in terms of observed hardiness levels. By using gender and the above-mentioned personality factors, it was thought that it would be easier to isolate the influence of hardiness on the success of ARFF Marines in training. However, as there was only one female participant, these ideas were abandoned. Using regression analysis, hardiness (as measured by the DRS15-R) was determined to be the primary predictor variable. The results of the aforementioned will be presented in a descriptive table displaying the means, standard deviations, beta coefficients, and inter-correlations of the collected data.

Protection of Human Participants

This study undertook all necessary measures for the protection of study participants. As discussed previously, this study obtained permission from the Marine Corps Commanding Officer at the Louis F. Garland Department of Defense Fire Academy. Upon final defense and approval of the proposal, a request for approval to conduct research was submitted to Walden University's Institutional Review Board (IRB). Only when this was procured did the study proceed.

As military personnel are often considered to be a vulnerable population in terms of research, every effort will be made to ensure that Marines understood their

participation was strictly voluntary, and there would be no negative repercussions for non-participation. The survey packets distributed contained detailed consent forms that explained their rights, described the purpose of the study, and invited them to participate. The packet identified the researcher as a student at Walden University working towards a Ph.D. in Public Policy & Administration and conducting the research as a part of his dissertation process.

The introductory letter informed participants the study concerned research on the psychological resiliency of United States Marine personnel, and should they decide to participate, they were asked to complete a survey concerning their perceptions about their own attitudes and behaviors. The anticipated time for completing the questionnaire was provided (approximately 45 minutes). They were assured their participation was voluntary, and they could decline to answer any questions or cease participation at any time (*e.g.*, "You may refuse to participate or withdraw from the project at any time with no negative consequences"). Participants were informed there were no foreseeable risks for completing the surveys, nor were there any benefits ("No compensation will be provided for participation in this study").

Participants were apprised of the fact that only the researcher would have access to the data collected, and that, upon completion of the research, completed surveys would be kept in locked storage for a period of five years, after which time they would be destroyed. Neither the names nor any personally identifiable information will appear in any reports of this study. Participants were also informed they have a right to review copies of the surveys and the final study. Finally, participants were asked to sign that they

understand the voluntary nature of their participation and give permission to use their responses in this study.

Dissemination of Findings

Plans for disseminating the findings of this study include making the results available to communities of interest in the Marine Corps and the other branches of the United States military (to include the Coast Guard), the Department of Defense, and the Veterans' Administration. Primary audiences also include civilian first responders such as federal, state, and local police, fire, and emergency medical departments, and their associated academies and training institutions. Civilian organizations or individuals who are involved with stress-mitigation and resiliency initiatives in any context will also likely be interested and perhaps benefit from this study. The presentation of this completed dissertation to students and faculty at Walden University Residencies or similar forums is also a possibility.

Summary

The purpose of this research was to determine whether the attitudes and behaviors of hardiness (Kobasa, 1979) evinced by Aircraft Rescue and Firefighting Specialists (ARFF) Marines during entry-level training correlated to success in both classroom performance and during practical exercises. This chapter presented the approach and methods used to collect and analyze the necessary data to answer the research questions. This study used a quantitative, nonexperimental survey research design, and data collection and analysis approaches were also discussed. Information on the measures taken to protect study participants was provided, as well as the plan to disseminate the study findings. Chapter 4 will present the findings of this study, and Chapter 5 will offer

some tentative conclusions, provide some suggestions for future research, and discuss the

implications for social change.

Chapter 4: Results

Introduction

The purpose of this study was to determine whether the respective levels of psychological resilience, as measured by the self-reported attitudes and behaviors of hardiness (Kobasa, 1979), on the part of United States Marine Corps ARFF specialist trainees correlated to success in both classroom performance and practical exercises during entry-level training. It was expected that this ex post facto study would show that the hardiness levels measured at the outset of training would have predictive validity, that high hardiness ratings and high performance would be correlated, and that low hardiness ratings would presage below average performance, or even failure.

This chapter presents the approach used to collect and analyze the data used in answering the research questions and the results of these data analyses, including descriptive characteristics of the sample population. The initial findings will be discussed, and a summary of the results will be provided. Chapter 5 will provide a discussion of the study's findings as well as some tentative conclusions and what implications the results have for future research and for social change.

Research Questions and Hypotheses

The overarching research question guiding this study was, "How does hardiness affect the performance of Marine Corps ARFF specialists in training?" The research hypotheses derived from this question for testing in this study were:

$H_0 1$: There is not a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_1 1$: There is a statistically significant relationship between higher hardiness scores and successful course completion by ARFF Marine trainees.

$H_0 2$: There is not a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

$H_1 2$: There is a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises.

In other words, I expected to find that those Marines who had higher self-reported hardiness scores would not only be more likely to successfully graduate the ARFF specialist course, but also that the more "hardy" individuals would be the more academically successful, both in the classroom environment and in practical application exercises.

Research Tools

In this study, the 15-item Dispositional Resilience Scale (DRS15-R) was used to measure hardiness, a brief instrument shown be internally consistent, valid, and reliable (Bartone, 2007). As a control, general personality factors were measured through the use of the Saucier's (2002) minimodular markers (3M40). No adjustments of these standardized research instruments were made.

Data Collection

Participants were drawn from a group of active-duty entry-level Marines who were training to obtain the primary MOS of ARFF specialist. As stated previously, ARFF specialists are the Marine Corps' flightline firefighters and first responders (United States Marine Corps, 2008) who train other military personnel in these skills and perform the warfighting functions required of all Marines,.

The setting selected for this study was the Louis F. Garland Department of Defense Fire Academy, located on Goodfellow Air Force Base, in San Angelo, Texas. The reason for this choice was simple: It is the only location where the target population for this study resides. Using convenience sampling, the intent was to offer all Marine ARFF trainees the opportunity to participate. The schoolhouse population tends to fluctuate, but there are typically 40 to 50 students per course, with two near-concurrent courses running at a given time (B. Henson, personal communication, December 12, 2011). Prior to arriving at the Fire Academy, I had hopes that the participants would comprise the entire population.

I asked participants to complete the two aforementioned surveys. The first measured hardiness (the DRS15-R), the other, the five-factor model of personality traits (the 3M40). I purchased a license to use the DRS15-R instrument and secured permission for its use from its creator, Dr. Paul Bartone (P. Bartone, personal communication, August, 22, 2012), and subsequently received the instrument, scoring materials, and statistical norms via e-mail. While the 3M40 is freely available and does not require permission for use, as a courtesy I contacted its creator Dr. Gerald Saucier to notify him of my study (G. Saucier, personal communication, August 27, 2012). I also sought and received permission to include these instruments as appendices in this dissertation. Once these materials were in my possession, I printed out both surveys and the informed consent forms and divided them into individual participant packets. The consent forms explained the nature of the research and the instructions for completing the surveys.

I arrived at Goodfellow Airforce Base on May 6, 2013, with intention of staying through May 7th to collect participant data. The goal for the data research was a sample of

not less than 40 volunteers. Upon my arrival at the schoolhouse on the morning of the 6th,
I was afforded the opportunity to address all the students then undergoing training. In
accordance with the stipulations of my approved Institutional Review Board (IRB)
application (Study Approval #02-04-13-0247248), I explained the nature of my intended
research and my role in the process before actively soliciting participants.

Dressed in business casual attire, I explained to the assembled Marines that I was
coming before them strictly as a public policy PhD candidate at Walden University who
was seeking assistance in completing a research study. I assured the group that while I
was a Marine Corps officer and a current PhD holder, my research was a function of my
role as a student and not due to my affiliation with the Marine Corps. I affirmed I was not
a member of their chain of command or a part of their formal leadership hierarchy. I
emphasized repeatedly that I had no authority over them, nor was I in any way
responsible for their training or education, or any evaluation thereof. I then went on to
explain the purpose of the study, its inherent voluntary nature, the nature of participant
involvement, its risks and benefits, and points of contact for questions (other than
myself), all before providing the statement of consent they were to sign if they wished to
participate.

Data Analysis

I recruited 61 volunteers, all ARFF students available at the time I visited the
training center. The final number of valid survey packets was 60: One of the completed
surveys was missing the personal identification information necessary to utilize its data in
an ex post facto study. This sample has statistical relevancy for the Marine ARFF
specialist trainee population, as the typical annual student throughput of the schoolhouse

is approximately 100 students. Further, at the time of this writing, in the entirety of the

United States Marine Corps there are only 983 enlisted personnel who hold this MOS. No

demographic data were collected, beyond rank and gender. The final sample contained 59

males and 1 female participant; gender differences were not studied. Table 2 presents

rank order and distribution of ranks.

Table 2

Rank Order and Distribution (N = 60)

Rank Order	Rank Distributions
E1	1
E2	51
E3	5
E4	3

On August 21, 2013, I received the final grades and performance records of all

participants from the ARFF training staff, and it was then I was able to begin the

necessary statistical analyses to complete this ex post facto study. Before beginning, I

took the time to examine the raw data. Out of the 60 viable participants, there were final

data for only 56 students, as four participants did not graduate, and therefore did not have

final grades and/or pass/fail marks for their practical application exercises. Of these, one

participant was dropped due to "injuries sustained during training" and another for

unspecified "medical reasons." The remaining two were academic failures, each having

been disenrolled for a combination of academic and performance-based exercise failures.

I noticed one of the four participants who failed to graduate the course had, by a large margin, the lowest hardiness score of the entire group. While a single line of unanalyzed raw data was in and of itself of little value, I admit to experiencing some excitement at this, the first glimmer of evidence supporting my alternative hypotheses. My initial enthusiasm was dampened when further examination revealed that the individual in question was one of the aforementioned participants dropped due to "medical reasons." Though hardiness might well contribute to existential courage in the face of illness/injury, such an examination was beyond the scope of this research.

The statistical analysis software used for this study was Statistical Process and Service Solutions (SPSS), Version 21. The initial analysis undertaken was to determine measures of central tendency (*i.e.,* mean, median, mode) for the viable sample of participants. Results of this analysis are displayed in Table 3.

Table 3

Measures of Central Tendency (N = 60*)

Variables	Scale Range	Sample Range	*M*	*Mdn*	*Md*	*SD*
GPA*	80-100	80-97	86.79	86.00	87.00	4.28
Prac App Failures	0-3	0-3	1.30	0	0	1.04
Hardiness	0-45	20-45	33.98	35.00	38.00	5.17
Neuroticism	0-72	8-53	31.92	31.00	29.00	9.80
Extraversion	0-72	30-68	50.38	49.50	47.00	9.08
Openness	0-72	32-70	50.25	51.00	47.00	8.43
Agreeableness	0-72	33-69	55.10	56.00	56.00	8.81
Conscientiousness	0-72	38-72	56.38	56.50	60.00	7.43

Hardiness as Predictor of Course Graduation

Subsequently, I ran an independent samples *t* test. Observing the results, the first

output box displayed the group statistics showing the mean hardiness scores for graduates

and nongraduates, respectively. The initial scores seemed to be confirmatory of my

alternative hypothesis, in that the mean hardiness scores of nongraduates were somewhat

lower than that of the graduates. However, I also observed that there appeared to be

significant size difference between the standard deviations of the two groups. Table 4

shows this output.

Table 4

Group Statistics of Graduates' vs. Nongraduates' Hardiness Levels

	N	Mean	Std. Deviation	Std. Error Mean
Graduates	56	34.11	4.857	.649
Non-graduates	4	32.25	9.394	4.697

The subsequent SPSS output displaying the results of the actual independent

samples *t* test to compare the relative hardiness levels of graduates and non-graduates

was concerning. An independent samples *t* test assumes that in a comparison between

two groups that the differences in standard deviation of the groups will not reach the level

of statistical significance. In this case, when looking at Levene's test for equality of a

variance, I observed that the *F* value was excessively large (4.894). Further, the

significance of this value was .031, indicating that the *F* value was statistically significant

($p =< .05$). Table 5 shows the complete results of this independent samples *t* test.

Table 5

Independent Samples Test of Graduates' vs. Nongraduates' Hardiness Levels (N = 60)

Hardiness	F	Sig	*t*	*df*	*Sig. (two-tailed)*
Equal variances	4.894	.031	-.691	58	.492
Non-equal			-.392	3.116	.721

Because the significance *p* value was less than .05, the standard deviations

between the two groups (graduates and nongraduates) were definitively shown to be not

the same, and the homogeneity of variance did not hold. Thus, I could not rely on the

validity of the *t* and significance values. Furthermore, the two-tailed significance values,

whether equal variances were assumed or not, were well above the threshold required to

meet statistical significance (.492 and .721, respectively). The observed results could be

the product of mere chance. I therefore was unable to reject my null hypothesis that there

was no difference between the mean hardiness levels of graduates as opposed to

nongraduates of the Marine Corps ARFF course.

Hardiness as Predictor of Practical Application Successes

I then performed a multiple hierarchal regression analysis wherein the dependent

variable was the number of practical application failures (*N* = 60), using stepwise

selection. After performing the statistical analysis, I first consulted the model summary

table provided in the SPSS output and referred to the *R*-square values section to see what

portion of the result was accounted for by variables entered in the first block, those that I

wished to control for, so as to better isolate the effects of the hardy disposition, if any.

These results are displayed in Table 6.

Table 6

Summary of Hierarchical Regression Analysis for Variables Predicting Practical Application Success

Variable	B	t	sr^2	R	R^2	ΔR^2
Step 1				.362	.131	.131
Rank						
Extraversion						
Agreeableness						
Conscientiousness						
Emotional Stability						
Intellect/Openness						
Step 2						
Rank				.370	.137	.006
Extraversion						
Agreeableness						
Conscientiousness						
Emotional Stability						
Intellect/Openness						
Hardiness						

The score of .131 indicated to me that those variables I wished to control were

observed to account for approximately 13% of the variability in the outcome (practical

application failures). Moving on to my second block of variables that included both the control variables and the hardiness scores that were the focus of my study, I saw that the overall effect of all variables on the outcome had risen only to .137, or perhaps 14% of the variability of successful completion of practical application exercises by Marine ARFF students.

To isolate the effect of hardiness on practical application performance in this study, I consulted the *R*-square change portion of the output data, which displayed a score of .006. This indicated that the hardiness scores of study participants had an effect of something less than 1% percent on practical application performance when the effects of rank and various attributes measured by the five factor model are controlled for. Hardiness did not have a significant amount of variance prediction.

Looking at the model Summary table, I saw then that this information was in fact irrelevant: The Change Significance portion of this table, in the *Sig. F Change* column, showed the analysis had a significance level (.550) well over the maximum threshold of statistical validity ($p=<.05$). See Table 7.

Table 7

Model Summary Change Statistics for Hierarchical Regression Analysis for Variables Predicting Practical Application Success (*N*=60)

Model	F Change	df1	df2	Sig F Change
1	1.331	6	53	.260
2	.362	1	52	.550

Further confirmation of the inability of the model to predict outcomes was observed in the results of the SPSS ANOVA table (see Table 8) wherein the Sig. value of the complete model was shown to be .331; again much higher than the maximum threshold for statistical validity ($p=<.05$). While it controlled for my confounding variables and isolated my intended predictor variables, this model appears not to be a statistically significant predictor of successful completion of practical applications at the United States Marine Corps ARFF schoolhouse.

Table 8

Summary of ANOVA for Interaction between Hardiness and Practical Applications (N = 60)

	Model 1			Model 2		
Variable	*Mean Square*	*F*	*Sig.*	*Mean Square*	*F*	*Sig*
Regression	1.410	1.331	.260	1.264	1.179	.331
Residual	1.059			1.072		

Had the model been shown to have statistical validity, I would have then consulted the data output concerning coefficients for all of the variables used in the model so as to assess their respective impacts on the outcomes. However, since none of the predictors were found to be statistically significant (either the intended predictor

variables or the confounding variables), none of the coefficients can provide any predictive value.

Hardiness as Predictor of Final Grade Point Averages

I then conducted another multiple hierarchal regression analysis wherein the dependent variable was final grade point average (*n*=56). As with the previous analysis, stepwise selection was employed to account for missing data, in this case the four ARFF students who did not graduate the course, and as a consequence did not have final grade point averages.

As with the previous statistical analysis, the SPSS model summary table provided me the *R-square* values delineating that portion of the result was accounted for by variables that I wished to control so as to better assess the relationship, if any, of participants' hardiness scores to their final grade point average. Table 9 shows the result.

Table 9

Summary of Hierarchical Regression Analysis for Variables Predicting Final Grade Point Average (*n*=56)

Variable	B	*t*	sr²	*R*	*R²*	Δ*R²*
Step 1				.382	.146	.146
Rank						
Extraversion						
Agreeableness						
Conscientiousness						
Emotional Stability						
Intellect/Openness						

Step 2

Rank	.393	.154	.009
Extraversion			
Agreeableness			
Conscientiousness			
Emotional Stability			
Intellect/Openness			
Hardiness			

As shown, the confounding variables received a score of .146 meaning that these would account for approximately 15% of the variability in participants' final grade point average. The second block of variables including both the control variables and the predictive values (hardiness scores) under examination displayed an overall effect of .154 or 15% of the variability of Marine ARFF students' final grade point average. The *R-squared change* portion of the output data highlighted this paucity of effect displaying a score of .009, indicating that the observed hardiness scores had an effect of perhaps 1% on final grade point average after controlling for all the confounding variables.

However, just as with the previous analysis of the relationship of hardiness to practical application performance, the resultant *Sig. F Change* of .484 was well over the maximum threshold of statistical validity ($p=<.05$). The addition of the hardiness variable does not contribute in a statistically significant fashion to the prediction of final grade point averages, as shown in Table 10.

Table 10

Model Summary Change Statistics for Hierarchical Regression Analysis for Variables Predicting Final Grade Point Average (*n*=56)

Model	*F Change*	*df1*	*df2*	*Sig F Change*
1	1.393	6	49	.236
2	.498	1	48	.484

The results of the concurrent ANOVA analysis provided further confirmation of the model's inability to predict final grade point averages. Once again, the Sig. value of the complete model was much higher than the maximum acceptable tolerances for statistical validity (*i.e.*, .294>.05). This multiple hierarchal regression analysis appeared not to be a statistically significant predictor of the final grade point averages of students attending the ARFF course. Table 11 shows the results of this analysis.

Table 11

Summary of ANOVA for the Interaction between Hardiness and Final Grade Point Averages (n=56)

	Model 1			Model 2		
Variable	*Mean Square*	*F*	*Sig.*	*Mean Square*	*F*	*Sig*
Regression	24.521	24.521	.236	22.282	1.253	.294
Residual	862.491			17.784		

As was the case with the previous analysis of the correlation between hardiness and practical application failures, there was no value in reviewing the coefficients for the variables used in the model or to attempt to assess their respective effects on the outcomes, since neither predictor variables nor confounding variables were found to be statistically significant (*i.e.*, possessing predictive value).

Initial Findings

My study had a very respectable response rate of 61 out of 61 available participants, well above my target goal, and which netted 60 viable survey packets. The raw data I received at the conclusion of training revealed that 56 of the 60 had successfully completed the course. However, even before beginning statistical analyses I observed that two of the four non-graduates were dropped from training due to "injuries" and "medical reasons"; situational factors that could not be properly assessed within the parameters of my study.

Looking at the raw data, the robust graduation rate of ARFF Specialist trainees, the relatively high grade point averages of all participants, the fact that two of the four non-graduates failed to graduate for *physical* (as opposed to *dispositional*) reasons, led me to begin to suspect that successful completion of the course might be predicated on factors not measured in my study.

I then completed my various data analyses and found there was no observed statistical difference between the hardiness levels of graduates and non-graduates. It was clear that my ex post facto model to predict ARFF Specialist trainee success in the classroom and during practical application exercises based on their respective hardiness levels had failed. It was then I recalled with the words of Francis Bacon,

it is an innate and constant mistake in the human understanding to be much more

moved and excited by affirmatives than by negatives, when rightly and properly it

should make itself open to both; and in fact, to the contrary, in the formation of

any true axiom, there is superior force in a negative instance. (Bacon, 2000, p. 43)

I chided myself for being disappointed by my failure to reject my null hypotheses,

and instead became intrigued by the search for reasons why this might be so. In

contemplating why the analyses resulted as they did, I considered first the most likely

cause: Biases on the part of the participants, and myself coupled with the possibility that I

had not taken every possible precaution to mitigate them.

Biases are legion, but given the nature of my study some seemed more likely than

others. Auspices bias, for instance, is the tendency of respondents to answer survey

questions predicated on their attitudes toward the survey provider, rather than on the

substance of the questions asked (Alreck & Settle, 1995). As might be expected, the

military is a hierarchal organization, with great differences in positional power. This

asymmetry is even more pronounced in a military training environment. In this study, I, a

commissioned officer in the United States Marine Corps, sought the participation of

rather junior enlisted Marines who were undergoing entry-level education in a very

regimented school environment. Because of this, the possibility of data corruption due to

auspices bias is likely quite high.

Even before conducting my first statistical analysis, I had noticed that the raw

hardiness scores of my participants were noticeably higher than the historical norms,

either adult or college-aged, provided by Dr. Bartone when I purchased the DRS15-R.

Later, upon witnessing the results of all the data analyses and after a period of reflection, I considered that a *social desirability bias* may have affected participants' answers.

Social desirability bias refers to the tendency of respondents to answer questions in ways that comport with prevailing societal norms, rather than to give truly heartfelt answers (Alreck & Settle, 1995). As described previously, the United States Marine Corps is a military organization, and as such, it puts a premium on the martial virtues. Its warrior ethos stresses stoicism in the face of hardship (Sherman, 2005). The Marine Corps Leadership Traits include such virtues as decisiveness, initiative, endurance, bearing and courage (United States Marine Corps, 2002). Given this, and given the fact that most of the study participants had only recently graduated the process of cultural indoctrination known as Marine Corps Boot Camp, it is not unreasonable to consider the possibility that participants may try to respond to questions in ways thought to be acceptable by the Marine Corps hierarchy. After all, one of the organization's three Core Values is *commitment* (United States Marine Corps, 2002), and commitment is , of course one of the three c's of hardiness.

To ameliorate deference to rank and perceived organizational power as a Marine Corps officer, I did not wear my uniform, and I attempted to incorporate the survey completion process into quotidian administrative work. However, while this last step may have gone some way to reduce this bias, it may have increased the likelihood of *response error*, wherein boredom or fatigue regarding the research task (in this case survey completion) (Alreck & Settle, 1995) corrupts the data. I was always concerned the nature of the study (survey based) would seem burdensome to a group of stressed students. Having been through the military training and education process many times throughout

my career, I can well imagine participating, perhaps begrudgingly, and then answering carelessly or haphazardly after succumbing to survey fatigue.

This self-knowledge reminds me that my own biases must also be considered in evaluating the results of this research. Barzun and Graff (1992) warn the would-be researcher that, "Nobody can be a perfectly clear reflector of what he finds. There is always some flaw in the glass whose effect may be so uniform as not to disclose itself" (p. 46). Therefore, the aforementioned biases of others and myself will be difficult to detect, much less control, and thus their effects on the study data cannot be ruled out. Even assuming they could, I realized there were variables not accounted for in my study design that may have had pronounced effects on the results.

I found myself considering the possibility that the ARFF training and education regimen at the schoolhouse, while challenging, was not prohibitively difficult for a reasonably fit, smart, and dedicated individual. By the organizational definition, all Marines should fit this description. It is, after all, an entry-level school. Unlike similar studies conducted in military training and education environments (Bartone, Roland, Picano, & Williams, 2008; Maddi, 2007) the primary mission of the ARFF schoolhouse is not assessment and selection, per se. The primary mission of the schoolhouse is to ensure that a large number of Marines graduate with the skills and knowledge to perform their duties under the supervision of more seasoned practitioners of their vocation. In this sense, it is more akin to a trade school, albeit a rigorous one.

This is not to say the course is not suitably challenging, or does not serve to weed out those individuals who are demonstrably unsuited for this line of work. It is, and it does. This observation is not to be a comment on the relative difficulty of the course, or

the appropriateness of its method. Rather, it is meant to be a statement of the effectiveness of the pedagogy and the talent of the instructors. It appears to be a well-designed system that is also *run* exceedingly well. It would seem only those Marines who are likely to pass the course are selected to attend. Students are in no way assured of success, but they are given every opportunity to succeed. Those in need of remediation receive it in abundance.

It may be, in this environment, a student need not have hardiness scores well above the mean to succeed. Note the effect of the control variables in this study (*i.e.*, the five-factor model of personality traits; rank) did not rise to the level of statistical significance. The incremental process of the curriculum seems to ensure that the students grow in confidence and competence such that their respective levels of stress are at least manageable. Whether they are enjoying the process is beyond the scope of this research, and (some would say) largely beside the point.

Also, and as discussed earlier, students undergo extensive screening before being allowed to attend the course. Consider: All participants are, at a minimum, basically trained Marines who have undergone months of rigorous to training just to attain that title. As mentioned, Marines attending ARFF Specialist training need to have certain basal intellectual and psychological attributes before being afforded even the opportunity to attend the course. Indeed, even before a citizen can become a recruit (*i.e.,* a potential Marine in training), they must pass a vetting process that is perhaps the most thorough of all the major service branches. This pre-vetting no doubt increases the students' likelihood of success.

It may well be that the average ARFF student has already received a hardiness inoculation of sorts: Marine Corps Boot Camp. Consider that the culminating event in Marine Corps boot camp is "The Crucible": a grueling 54-hour long field exercise, wherein recruits have to overcome physical and psychological stressors while attempting to complete numerous tasks fraught with friction, chaos, ambiguity, and "the fog of war", all while receiving little food and less than eight hours of sleep. The name of this final trial by fire is clearly apt. In alchemy, a crucible was used to separate the dross from precious metals, to convert base elements into gold. Given a Marine who is selected to attend the ARFF Specialist MOS accrediting school, has already succeeded in completing both boot camp and entry-level combat training, it is not unreasonable to assume that he or she may have hardiness scores that are above the norm.

Summary

The purpose of this ex post facto study was to evaluate what effect, if any, participants' respective hardiness levels had on their performance as they trained to become United States Marine Corps ARFF Specialists. The dispositional attitudes/behaviors of hardiness was found to have no demonstrable impact on the successful performance of United States Marine Corps ARFF Specialist trainees, regardless of whether the basis of evaluation was graduation rates, practical application successes, or final grade point average. The five-factor model of personality traits, assumed at the outset to be confounding variables, and which were measured to better isolate the effects of hardiness, also had no predictive validity. This chapter presented the approach used to collect and analyze the data used in answering the research questions, and the results of these data analyses. The final chapter will provide a discussion of the

study's findings, some tentative conclusions, and their implications for future research and social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to determine whether the respective levels of psychological resilience, as measured by the self-reported attitudes and behaviors of *hardiness* (Kobasa, 1979), on the part of United States Marine Corps ARFF specialist trainees correlated to success in both classroom performance and practical exercises during entry-level training. It was expected that this ex post facto study would show that the hardiness levels measured at the outset of training would have predictive validity, that high hardiness ratings and high performance would be correlated, and that low hardiness ratings would presage below average performance, or failure.

Overview

Using convenience sampling, the researcher recruited participants from amongst ARFF specialist trainees at the Louis F. Garland Department of Defense Fire Academy, Goodfellow Air Force Base, in San Angelo, Texas, the only location where the selected population for this study existed. All Marine ARFF trainees present at the time the researcher visited the academy were afforded the opportunity to participate, and all 61 agreed, a 100% return rate. Of completed survey packets, 60 were viable. I then scored the completed packets, containing surveys to measure the hardiness construct (DRS15-R) and the five-factor model of personality traits (3M40). The dispositional attitudes and behaviors of commitment, control, and challenge evinced by participants and measured by the DRS15-R in relation to academic and practical application success was the focus of this ex post facto study.

As mentioned previously, the guiding research question for this study was, "How does hardiness affect the performance of Marine Corps ARFF Specialists in training, if at all?" The alternative hypotheses expressed the belief that there would be a statistically significant relationship between higher hardiness scores and successful course completion, as well as a statistically significant relationship between higher hardiness scores and higher academic scores, in both the classroom and during practical exercises on the part of ARFF Specialist trainees.

As the data analysis in Chapter 4 explained, the dispositional attitudes/behaviors of hardiness were found to have no demonstrable impact on the successful performance of United States Marine Corps ARFF Specialist trainees, regardless of whether the basis of evaluation was graduation rates, practical application successes, or final grade point average. What is more, the five-factor model of personality traits, which were assumed confounding variables and sought to control to better assess the effects of hardiness, were also observed to have no statistically significant predictive validity in this research.

Interpretation of Findings

The results were unexpected, as they deviate from the amassed literature discussed in Chapter 2. Of interest, are the observed overall means for the hardiness scores of the participants in this study when viewed in comparison to the historical demographic norms provided by Dr. Bartone, the creator of the DRS15-R. In this study the overall means for hardiness scores was 33.98, with a standard deviation of 5.17. Compare this to the closest demographic antecedents to this sample. A group of U.S. Military Academy students (N=6,039), from the classes 2005-2009 had a mean = 29.15; Std. Deviation 4.63. Another sample of 4,863 West Point cadets displayed a mean=29.30;

Std. Deviation: 4.70, and a group of students at the University of Bergen, Norway

(N=312), wherein the mean was 26.8; SD 4.2 (Bartone, 2010). This raises the question: Is

the mean hardiness level of Marine ARFF trainees in fact higher than that of their near

contemporaries, or are their higher scores an anomaly due to some factor or factors not

accounted for in this study. It could be a result of the much smaller sample (N=60),

unintended biases on the part of the researcher and/or participants, a combination of

these, or some other factors entirely. Note, however, the mean scores of the Marine

ARFF trainees falls well below the historical norm with the largest sample (N=7281) of

adults, ages 20 – 60, whose mean was 39.76 (Bartone, 2010), so it may well be that the

scores are accurate. If so, this particular group of Marine ARFF trainees was, on average,

more hardy that their most analogous demographic group for which we have historical

norms, *even if* greater than average hardiness did correlate to higher academic and

practical application performance during training.

If the observed scores for the sample group are valid and an accurate reflection of

reality, the Marine ARFF Specialists display a higher than expected level of hardiness in

general, although without this having a verifiable correlation with above average

performance levels in their formal training and education environment. Again, this does

comport with the most current research at the time of this writing. For example, a recent

longitudinal study shows that hardiness predicts military leader adaptability under stress

amongst West Point cadets better than some other measures (Bartone, Kelly, &

Matthews, 2013). It would seem that Marine Corps culture inculcates resilience/hardiness

at an appropriate level during entry level training, but the Marine Corps should

consciously continue this process as personnel develop and as the situations they face become more complex (and therefore more stress inducing).

Implications for Social Change

As was discussed in Chapter 1, it was hoped that this study's findings would confirm that resiliency, in the form of psychological hardiness, had predictive validity for the successful performance of military first responders. However, while the results of this study did not bear this out, the amassed literature supports the contention that both resiliency in general and the hardiness construct in particular have value for adoption by both individuals and policy makers in high-stress organizations. While more and better research is needed, the researcher still believes that the inculcation of individual and organizational resiliency can make personnel more effective and efficient, improve their biopsychosocial health, improve quality of life, and save taxpayer money.

As discussed in Chapter 2, the Marine Corps is an organization whose culture is suffused with a respect and admiration for the attitudes and behaviors associated with classical Stoic philosophy, even if it is not explicitly stated as such (Sherman, 2005), and it could be argued that elements of Stoicism comport with those of hardiness. Hardiness, as we have seen, is composed of the three attitudes of commitment, control, and challenge (Kobasa, 1979). Similarly, according to the Stoic sage Epictetus, the foundational principles for an aspirant to the Stoic life are also three in number (Oldfather, 1928).

The first principle deals with desire and the passions, specifically, the correct understanding of what one should desire, what one should seek to avoid. For the Stoic what are to be eschewed are those things that are external to us. As Epictetus says, "…the

desires and the aversions, that a man may not fail to get what he desires, and that he may

not fall into that which he does not desire" (Long, 1890, p. 201). In other words, one

should concentrate exclusively on monitoring one's emotions and affect in the present

moment, and not maladaptively wish for challenging situations to be other than they are.

This, it could be argued, has some similarity to the first principle of hardiness, that of

commitment. Commitment, as we have seen, is the ability to embrace life in full as it

happens and remain determined in the face of adversity (Kobasa, 1979).

 The parallels continue with the second Stoic principle, that of appropriate *action*

(Long, 1890). Epictetus admonishes readers that it is incumbent on them to engage fully

in daily life and play their respective roles in society to the best of their ability, regardless

of outcomes or the impressions of others. The parallel to the control dimension of

hardiness is obvious. Control is a belief that one is not a passive spectator in the game of

life, and that one can and should take appropriate action to make meaningful change

(Kobasa, 1979).

 The third Stoic principle involves *assent*, or the thoughts we allow ourselves to

entertain, insofar as that is possible (Long, 1890). The most rarefied of the three

disciplines, it involves rigorous control over what personal, subjective interpretations one

gives to one's experience and sense impressions. As such, it directly affects what the

aspiring Stoic will desire/avoid, and how they will act (Long, 1890). The Stoic principle

of assent is analogous to the hardiness component of *challenge*. It is mindset that

recognizes change can be a means of personal growth and enjoyment, not inherently

negative or disruptive (Kobasa, 1979), and it provides the hardy foundation for

"existential courage" through "attitudes of commitment (vs. alienation), control (vs. powerlessness), and challenge (vs. security)" (Maddi, 2004, p. 279-280).

The overlap of these two constructs, while not exact, is striking. As stoicism undergirds military culture (Sherman, 2005; Stockdale, 1995), and the three C's of hardiness comport with stoicism, I contend that resiliency is a part of the Marine Corps ethos. Perhaps what the organizational culture needs is a more concerted, deliberative effort to bring this knowledge to conscious awareness, embrace it, institutionalize it through policy and formal training/education, and then develop tools, tactics, and procedures to instill these dispositional factors in all personnel.

In the United States Marine Corps, studies should be undertaken in various training environments. Ex post facto studies conducted during entry-level training (*i.e.*, Boot Camp and Officer Candidate School), as well as during MOS training of various specialties are recommended. Of particular interest, would be studies conducted during particularly arduous specialized training, such as Assessment and Selection (A&S) pipelines for Marine Corps Forces Special Operations Command (MARSOC) and Marine Reconnaissance, as well as SERE (Survival, Escape, Resist, Evade) training. Both self- and other-reporting measures to assess personnel should be implemented. After pre-screening personnel, those needing assistance could receive training to improve hardiness attitudes, behaviors, and skills. One program that may be considered for adoption by both the military and first responder organizations is the HardiTraining program, whose goal is to develop a collaborative team environment with a bias for action (Maddi, 2002). If feasible, it could be modified to meet the particular needs of these demographic groups or, more preferably, the course of instruction could be woven into extant training,

education or developmental programs. In the case of the Marine Corps, such programs may be worthwhile additions to nascent resiliency initiatives, such as the Marine Total Fitness construct (United States Marine Corps, 2012). As mentioned previously, the fond hope is that any worthwhile disciplines spread to all military occupations throughout the Department of Defense, thereby making individuals, organizations, and society at large more resilient.

Recommendations for Action

The twin foci of this study were Marine Corps personnel and first responders, so it is recommend that future research analyze and evaluate the respective resiliency levels and training and education approaches of each, with an eye towards to cross-pollinating best practices. Along these lines, research examining the similarities, differences, and interconnections amongst military, first responders, law enforcement, and disaster relief workers should be undertaken. Resilience is needed in these disciplines especially; therefore, our efforts should take a multidisciplinary approach, one that is instituted at the outset as a fundamental part of training and educational processes, and not as an after-the-fact remedial, therapeutic treatment.

As mentioned above, the instrumentation used to assess resiliency should be as all-inclusive as possible, assess individuals from a biopsychosocial standpoint, and not be limited to self-report surveys (a possible shortcoming of this study). Finally, regardless of the lens through which individual and organizational resiliency are studied, more longitudinal studies are needed. In the case of the military, participants enlisted during or even before entry-level training could be assessed throughout their careers.

In terms of specific resiliency measures, the researcher is intrigued by the recent studies using the Connor-Davidson Resiliency Scale (CD-RISC) (Connor & Davidson, 2003). As discussed in Chapter 4, the failure of some of the participants in this study to graduate was due to physical (non-psychological) reasons, namely injury of one type or another. These were factors that were not, and could not be, accounted for in this study. The CD-RISC combines several existing measures, and while it includes the components of hardiness, it also purports to measure other characteristics (*e.g.*, goal setting, sense of humor, patience, etc.) of the resilient person (Connor & Davidson, 2003). Dong, Ablah, Nelson, Shah and Khan (2013) agree, pointing out that though earlier research used hardiness as a synonym for resiliency, the current understanding is that resilience is more all encompassing, can be understood as either biopsychosocial or biopsychospiritual, and as a state that is affected by biology, education and culture. Therefore, more research using holistic measures is called for.

It is incumbent upon organizational leaders and policy makers to leverage all existing tools and methods that have at least a modicum of a chance to instill resiliency at the individual and group level. As discussed in previous chapters, many initiatives seem to be rehabilitative, occurring after some traumatizing incident, or once an individual is deemed to be compromised. Carr, Ogle, Pyle, Bradley, Eonta and Santiago (2013) found that while pre-deployment resiliency training had a positive effect on both resiliency and morale (as measured by the above-mentioned CD-RISC), the effect was small and diminished over the course of the deployment. Thus while personnel need to be provided every advantage, leaders and policy makers need to temper expectations (their own and others) as to what resiliency training can realistically provide.

Suggestions for Future Research

Hardiness is not the only means of measuring, instilling and increasing individual, team and organizational resiliency. One of these is grit, or "perseverance and passion for long-term goals" (Duckworth, Peterson, Matthews, & Kelly, 2007, p. 1). Studies using the Grit Scale have shown that grit has predictive validity for academic success for West Point cadets, in its original form (Duckworth et al., 2007.), and when using the Short Grit Scale (Duckworth & Quinn, 2009). Measures can be combined, of course, in order to gain this more complete picture. Maddi, Matthews, Kelly, Villarreal, and White's (2012) study used both grit and hardiness measures to show their relationship in predicted academic success.

Another method that shows promise of late in the treatment of PTS and the maintenance of healthy psychosocial functioning generally, is that of "mindfulness", or "…paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p. 4). The practice of mindfulness has been shown to have salubrious effects, both proactively during training and remedially after traumatic incidents, for such groups as U. S. Army combat soldiers (Stanley & Jha, 2009), police officers (Williams, Ciarrochi & Patrick, 2010), urban firefighters (Smith, Ortiz, Steffen, Tooley, Wiggins, Yeater, Montoya & Bernard, 2011), and other military personnel exposed to a variety of stressful situations, including others suffering from PTS (Büssing, Walach, Kohls, Zimmermann, & Trousselard, 2013). Like hardiness, then, mindfulness is another mechanism that may assist individuals in high-stress occupations in maintaining and improving performance, fitness, health and recovery.

Still other factors and constructs contribute to resiliency, and are worthy of future research for both Marine Corps personnel and first responders. It has long been acknowledged that there are multiple ways of looking at mental competence; that human intelligence is not one thing (*i.e.*, I.Q.), but potentially many things (Gardener, 1975; Salovey & Mayer, 1989; Goleman, 1995) Emotional Intelligence (EI), "… the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1989, p 189), is one of these. EI is observed to be one of the factors that influence resiliency, and some of the EI research pertains directly to the demographics under examination in this study: those under stressful situations, generally, and military personnel in particular.

Using the *Bar-On EQ-i* instrument, in a study model that addressed such dispositions as Self-Regard, Optimism, and Happiness, Gordon (2010) found EI to have significant predictive validity (.45 regression coefficient) for the success rates for the United States Air Force's elite pararescue jumpers. Like hardiness, the U.S. Army's signature resiliency initiative, the Comprehensive Soldier Fitness (CSF) program has a salutary, preventative maintenance orientation, and acknowledges the biopsychosocialspiritual nature of resilience. Despite this, Sewell (2011) argues that the CSF is nonetheless incomplete, advocating that the inclusion of EI would strengthen the model. Gawali (2011) concurs, asserting that EI is both a fundamental part of resiliency and a set of skills that can be improved with training so as to improve health and performance generally, and allow individuals to better recover from traumatic events.

The deliberate, conscious attempt to create a state of *flow* or the state where one is "…so involved in an activity that nothing else seems to matter; the experience is so

enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990, p. 4), and he goes on to quote Stoic philosopher Marcus Aurelius admonition about controlling one's impressions of externalities, "If you are pained by external things it is not they that disturb you, but your own judgment of them. And it is in your power to wipe out that power now." (Cskiszentmihalyi, 1990, p.20), and this, as we have seen, is an orientation in keeping with both resiliency generally, and hardiness, specifically.

Black (2008) discusses how the ability to gain and maintain this state of consciousness has led to improved functioning on the part of high-level athletes through increases in mental and physical performance and adaptability under rapidly changing circumstances, and she offers that achieving of flow increases student's resiliency in a classroom environment. Given the needs of Marines, first responders and other elite professions in the classroom, in training during exercises and while fulfilling their respective missions in the real world, flow theory and the methods used to develop it should also be investigated.

Most intriguing to this researcher are the holistic and multidisciplinary approaches: those who eschew Cartesian mind-body models that separate human beings into their supposed constituent parts. In a meta-analysis of over 11,500 studies on the total fitness of military personnel, Rees (2011) found the amassed data shows that the three most efficacious methods of engendering overall soldier resiliency are, in order, Transcendental Meditation, mindfulness, and progressive muscle relaxation. Resiliency is not, it would seem just one particular attribute or disposition. Particularly intriguing is the 'Mental Gym™', which addresses the totality of the individual, using such modalities as

biofeedback, stress inoculation, and problem solving under duress. (Oded, 2011). Perhaps most importantly, this program treats resiliency training as "mental fitness", rather than "stress reduction" (Oded, 2011, p. 113); a conceptualization more palatable to high-achieving and image-conscious personnel. Ten years of individualized training programs for elite military Israeli personnel in a variety of occupations shows good results, and the program is expanding to include all military personnel (Oded, 2011). This is laudable, and future resiliency initiatives should work towards this goal.

Summary and Conclusion

At the outset of this study, the researcher could find no research that investigated the effects of hardiness on military first responders in training. The results of this study and all of the aforementioned lead the researcher to suspect there are no panaceas, no one-size-fits-all solutions. Maslow (1987) opined on the lamentable human tendency to regard all problems as nails when wielding a hammer. We cannot afford such limited thinking. Any organizational resiliency initiatives, be they for the military, for first responders, or for any other group, must be tailored to the needs of the subject-population, and must be multidisciplinary in nature.

Life is challenging, and those in the military and first responder occupations face unique stressors. In Chapter 2, I wrote of how hardiness is a means of engendering existential courage and persevering in the face of those things that are beyond human control. In his final speech, "Create Dangerously," Camus (1960) mused:

One may long, as I do, for a gentler flame, a respite, a pause for musing. But

perhaps there is no other peace for the artist than what he finds in the heat of

combat…Let us not look for …the way out…Instead, let us seek the respite where it is - in the very thick of battle…For…it *is* there. (p. 208).

This speaks to what it means to be resilient, to be hardy: Life is inherently stressful. Indeed, to be alive is to be stressed, and to ignore this fact is unrealistic. Individuals and organizations must aspire to be able to not only muddle through, but also find meaning, growth and even pleasure in the stressors of life. This cannot happen through avoidance or maladaptive coping mechanisms, nor will it happen spontaneously. As with all organizations, it is incumbent upon the Marine Corps to "create dangerously", to cast the net wide in attempt to discover potentially beneficial disciplines that will enable organizational members to improve both their performance and overall wellbeing. It is hoped that this study provided some insights into the potential benefits of hardiness and other resiliency initiatives for these highly deserving individuals. Regardless of the validity of this study's model, if this research was another step in the right direction, however small, then the journey has been more than worthwhile.

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Appendix A: DRS15-R

DRS-15

Below are statements about life that people often feel differently about.
Please show how much you think each one is true about you.
Give your own honest opinions . . . There are no right or wrong answers!

FILL IN THE BUBBLES TO SHOW YOUR ANSWERS

➢Not at all true
➢A little true
➢Quite true
➢Completely true

	Not at all true	A little true	Quite true	Completely true	Office use
Most of my life gets spent doing things that are meaningful	◯	◯	◯	◯	
By working hard you can nearly always achieve your goals	◯	◯	◯	◯	
I don't like to make changes in my regular activities	◯	◯	◯	◯	
I feel that my life is somewhat empty of meaning	◯	◯	◯	◯	
Changes in routine are interesting to me	◯	◯	◯	◯	
How things go in my life depends on my own actions	◯	◯	◯	◯	
I really look forward to my work activities	◯	◯	◯	◯	
I don't think there is much I can do to influence my own future	◯	◯	◯	◯	
I enjoy the challenge when I have to do more than one thing at a time	◯	◯	◯	◯	
Most days, life is really interesting and exciting for me	◯	◯	◯	◯	
It bothers me when my daily routine gets interrupted	◯	◯	◯	◯	
It is up to me to decide how the rest of my life will be	◯	◯	◯	◯	
Life in general is boring for me	◯	◯	◯	◯	
I like having a daily schedule that doesn't change very much	◯	◯	◯	◯	
My choices make a real difference in how things turn out in the end	◯	◯	◯	◯	

Appendix B: Mini-Markers Questionnaire

MINI-MARKERS

How Accurately Can You Describe Yourself?

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age. Before each trait, please write a number indicating how accurately that trait describes you, using the following rating scale:

1	2	3	4	5	6	7	8	9
Extremely Inaccurate	Very Inaccurate	Moderately Inaccurate	Slightly Inaccurate	Neither Inaccurate nor Accurate	Slightly Accurate	Moderately Accurate	Very Accurate	Extremely Accurate

____ Bashful	____ Energetic	____ Moody	____ Systematic
____ Bold	____ Envious	____ Organized	____ Talkative
____ Careless	____ Extraverted	____ Philosophical	____ Temperamental
____ Cold	____ Fretful	____ Practical	____ Touchy
____ Complex	____ Harsh	____ Quiet	____ Uncreative
____ Cooperative	____ Imaginative	____ Relaxed	____ Unenvious
____ Creative	____ Inefficient	____ Rude	____ Unintellectual
____ Deep	____ Intellectual	____ Shy	____ Unsympathetic
____ Disorganized	____ Jealous	____ Sloppy	____ Warm
____ Efficient	____ Kind	____ Sympathetic	____ Withdrawn

Appendix C: Author Approval to Use DRS15-R

-----Original Message-----
From: paul bartone [mailto: @gmail.com]
Sent: Wednesday, August 22, 2012 8:14
To: Bogden Maj Jason J
Subject: Re: DRS15 and Marine Corps Personnel

Hi Jason,

Glad to hear your proposal was approved!

Yes, you have permission to use the DRS-15 in your research.

And it's OK to include the measure in an appendix if you wish. Just include my copyright line.

Best of luck. If you need time extension we can do that no problem. Also feel free to call on me if you have any questions.

Best regards,

Paul

Curriculum Vitae

EDUCATION

Capella University, Minneapolis, MN
Ph.D. in Organization and Management   **2008**
Dissertation: "United States Marine Corps Reservists'
Perceptions of Civilian Leader Behaviors: A Comparative Analysis"

Central Michigan University
M.S. in Administration (Information Resource Management)   **2004**
Thesis: "Assessing the Feasibility of Information
Systems Training for Entry-Level Marines"

Thomas Edison State College
B.A. in Humanities   **1998**

PROFESSIONAL EXPERIENCE

United States Marine Corps
II MEF Advisor Training Cell   **2014-**

Regimental Communications Officer-6th Marine Regiment   **2013-2014**
Advised the Regimental Commander, subordinate
commanders and staff on the tactical employment of
communications and all communications assets.
Provided assistance, support and training for
communications, and communications maintenance
support within the Regiment, to include all
battalions/subordinate elements. Led, trained and
ensured the combat fitness, deployment readiness,
technical and professional training of all Marines.

Deputy Branch Head- Doctrine, Lejeune Leadership Institute   **2011-2013**
Lead researcher. Produced military and civilian
leadership doctrine, concepts, and policies. Created
learning products to instruct Marines and civilians in
understanding and applying Marine Corps core values
and leadership. Participated in conferences, seminars, and
meetings addressing leadership concepts, policies, and
doctrine both internal and external to the Marine Corps.

Assistant Branch Head-Enlisted Retention Section, HQMC   **2009-2011**
Led, coordinated, and managed internal operations.
Formulated plans, guidance, and instructions necessary to
implement retention policies; coordinated with
Manpower Plans and Policy Division as required.
Exercise staff supervision to ensure timely, accurate
responses to tasks promulgated by higher headquarters.

Inspector-Instructor-Communications Company, Allentown, PA   **2006-2009**
Led subordinates and ensured their professional
development in the areas of physical fitness, Core Values,
and occupational proficiency. Mentored Reserve
commander counterpart and provided guidance for the
proper training and execution of the unit mission.
Promoted and coordinated the Marine Corps Community
Outreach mission.

Information Systems Manager- Concepts & Plans Division, MCCDC   **2003-2006**
Responsible for the division's administrative programs and
its day-to-day operation. Assisted in the planning,
coordination, and execution of all operations to include
training exercises. Responsible for receiving, assigning,
tracking, and finalizing all administrative action
requirements from Headquarters Marine Corps.
Coordinated non-routine issues/initiatives requiring
command attention.