

ABSTRACT

Title of Dissertation: THE RELATIONSHIP BETWEEN PSYCHOSOCIAL
RESOURCES, STRESS, AND TASK COMPLETION IN ELITE
MILITARY TRAINING

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The purpose of this study was to test the ability of three psychosocial factors (social support, mattering, and self-efficacy) to protect soldiers from stress (expected and cognitive), injury, illness, and assist them in graduating from a physically challenging military program. Three hundred and eighty voluntary male Special Forces Assessment and Selection (SFAS) soldiers served as the subjects. Questionnaires were given to measure soldiers' psychosocial resources, expected stress, cognitive stress, and injuries/illnesses they may have acquired throughout the SFAS training. The outcome measures were injury and illness (physical outcome) and the soldiers' graduation, voluntary withdrawal, medical withdrawal, or "other" outcome (program outcome) from the SFAS program. It was hypothesized that soldiers with high psychosocial resources were less likely to become injured or ill than soldiers with low psychosocial resources, and therefore be more likely to graduate from the SFAS program and less likely to withdraw (voluntarily or medically) than soldiers with low psychosocial resources. It was

also hypothesized that soldiers with high psychosocial resources would perceive the SFAS training to be less stressful and have a lower expected stress and cognitive stress response than soldiers with low psychosocial resources. Expected stress was hypothesized to predict the soldiers' cognitive stress experienced during the SFAS program. Linear and multinomial regression analyses were employed to test these hypotheses. Physical fitness level and social desirability were controlled throughout the analyses.

Consistent with the research hypothesis, psychosocial resources were significantly related to the program completion. Expected stress also significantly predicted the level of cognitive stress soldiers experienced during training. Contrary to the research hypotheses, there was no significant relationship between psychosocial resources and expected stress or cognitive stress. The hypothesis related to psychosocial resources and physical outcome was not supported, but the indirect relationship between psychosocial resources, expected stress, cognitive stress, and physical outcome was partially confirmed. No significant relationship was found between expected stress and physical outcome or program outcome. In conclusion, psychosocial resources seem to increase the soldiers' likelihood of graduating from the SFAS program, but do not protect them from injuries/illnesses.

THE RELATIONSHIP BETWEEN PSYCHOSOCIAL RESOURCES, STRESS,
AND TASK COMPLETION IN ELITE MILITARY TRAINING

by

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DEDICATION

I would like to dedicate this work to my grandfather, Eugene Clougher, and my mother, Jeanne Clougher. I am fortunate to have inherited their work ethic and tenacious spirit that made the completion of this dissertation possible.

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Chapter 1

Introduction

Military training and participation has historically brought with it high injury and attrition rates. “For most of 225 years, the Army has lived with a high rate of injuries as cost of business” (Hoedebecke & Wells, 2002, p. 5). Injuries negatively impact the military by reducing the number of active soldiers, which affects readiness and costs millions of dollars that could be better spent on training and equipment. The loss of soldiers due to injury is very detrimental to the Army forces, causing the Army to lose the approximate equivalent of one division of soldiers each year (Hoedebecke & Wells, 2002). In an effort to reduce injuries and efficiently rehabilitate currently injured soldiers, the military has recently developed health education programs and has begun researching the causes of injuries and illnesses more closely.

Past injury and illness research has focused on physical and environmental factors that predispose one to injury. In the past decade, psychosocial factors and the influence of life stress on physical outcomes (injury and illness) have received increased attention (Hanson et al., 1992). Stress is generally defined as “a nonspecific response of the body to any demand made upon it” (Selye, 1983, p. 2). There are four types of stress: hypostress, hyperstress, eustress, and distress. Distress is considered “bad stress” and is manifested in the form of anxiety or tension (Cox, 1998, p. 94). Stress, if perceived to be threatening (distress), can cause severe psychological and physical changes (Anshel et al., 2001).

Over the past two decades, researchers (Harlow & Cantor, 1995; Thoits, 1986; Rosenberg & McCullough, 1981) have begun to recognize a relationship between

injuries, illnesses, and psychosocial resources. As understanding of the relationship between stress and athletic injury has increased, researchers have discovered psychosocial factors that buffer the effects of stress and protect people from injury. These factors and their ability to buffer stress and protect people from psychological and physiological illnesses have been explored in various research studies (Anthony & O'Brien, 2002; Chan, 2002; Harlow & Cantor, 1995; House, Landis, & Umberson, 1988). According to the current research, psychosocial resources protect people from psychological and physical illnesses and help with the recovery of both types of illnesses. Psychosocial resources, such as social support and mattering, have been shown to protect individuals from negative psychological states (Harlow & Cantor, 1995; Pearlin & LeBlanc, 2001; Rosenberg & McCullough, 1981). Similarly, social support has been shown to protect people from unexpected stressors (Doornbos, 1996; Thoits, 1986) and physical illnesses (House, Landis, & Umberson, 1988; Kennedy, Kiecolt-Glaser, & Glaser, 1990) and has also been beneficial in recovery from head injuries (Wagner, Williams & Long, 1990).

Although previous research studies have been helpful in recognizing the ability of psychosocial factors to buffer people from injury and illness, there has been limited research on psychosocial factors pertaining to injury and illness during a physically challenging event. In one of the few reported studies, Bramwell et al. (1975) found that an accumulation of challenging life events is directly related to the risk of injury among football players. How well an individual copes with a demanding situation can have a significant effect on the biological systems that affect health and wellness at any given time (Bandura, 1991). The few research studies conducted on psychosocial factors and

injury indicate that psychosocial factors have the ability to buffer injury and illness caused by physically challenging events. Although promising results are being reported, many questions remain unanswered: Are certain psychosocial factors better at protecting soldiers from injury and illness than other psychosocial factors? Do psychosocial factors have an additive or interactive effect? Are there psychosocial factors that provide protection against injury and illness that have not yet been researched? Do certain psychosocial factors play a significant role in buffering stress and protecting soldiers from injury and illness during a physical challenge that is a real-life survival experience (e.g., a 24-day survival test in the wilderness)? Does having psychosocial resources help soldiers successfully complete a physically grueling training program?

Throughout the literature, one psychosocial resource that has been recognized for its ability to buffer stress and aid in recovery is social support. Conducting several studies to understand the effect of social support on psychological well-being, Turner (1981) found that social support has a pervasive effect to buffer stress and protect psychological well-being. Similarly, House, Landis, and Umberson (1988) reported on the relationship between the number of social relationships individuals had and their risk of death.

Recent scientific work has established both a theoretical basis and strong empirical evidence for a causal impact of social relationships on health. Prospective studies which control for baseline health status, consistently show increased risk of death among persons with low quantity of social relationships. (House, Landis & Umberson, 1988, p. 540)

Another psychosocial resource theoretically believed to protect individuals from stress and mental illness is mattering. Mattering is defined as the extent to which we consider ourselves significant to others (Marcus, 1991a; Schieman & Taylor, 2001). “Mattering is our belief that significant others (i.e., family, friends, and colleagues) see us as important, an object of their attention, depend on us and are concerned with our fate”

(DeForge & Barclay, 1997, p. 429). Developed by Rosenberg and McCullough in 1981, the research conducted on mattering has been related to one's self-esteem and mental health (e.g., levels of depression). Mattering research indicates that individuals believing they did not matter to others had lower self-esteem and a negative affective state (Rosenberg & McCullough, 1981). Persons who score low in mattering may feel irrelevant and insignificant (Marcus, 1991a). Marcus (1991b) also found a moderate correlation between mattering and self-esteem and mastery, and a negative relationship between mattering and anxiety. There are a number of concepts in the literature related to mattering (e.g., social support, self-esteem), but mattering has been empirically and theoretically proven to be its own construct. Mattering is described as another dimension of one's self-worth.

Social support tends to be characterized by what ego believes he receives from alter. Mattering, on the other hand, is characterized more by what alter receives from ego (e.g., ego perceives that he matters based on what he has to offer or give alter). (Marcus, 1991a, p. 16)

Until now, the effects of mattering have been tested only on mental health and psychological stress, and according to Pearlin and LeBlanc (2001), mattering needs to be incorporated more into social psychological studies. There is no research on the effects mattering might have on physical injury or illness due to a physically challenging task and there is limited literature available about mattering as a psychological resource for task completion. Also, the effects of mattering and social support have never been tested together.

Due to all of the information known about the ability of mattering (Rohall & Segal, 2001; Pearlin & LeBlanc, 2001; Taylor & Turner, 2001) and social support (Chan, 2002; House, Landis, & Umberson, 1988) to buffer negative psychological states and negative

physiological responses, it is important to test the effects of these social resources together. In the previous research (Marcus, 1991a; Rosenberg & McCullough, 1981; Sarason et al., 1983), social support and mattering have been tested individually on their ability to buffer negative psychological and physiological responses, yielding significant results. The next logical step is to evaluate the effects of these resources together, and then determine whether these resources combined have an increased ability to buffer injury and illness or whether they are more effective independently. From the previous research, one can make the assumption that a person who believes he has a lot of social support and mattering (compared to a subject who believes the opposite) would have a significant buffer against injury and illness and a strong desire to succeed at a specific activity.

The third psychosocial resource that was proposed as an integral component of this research study is self-efficacy. Self-efficacy is one's belief in his capabilities to have the motivation and cognitive resources needed to meet given situational demands (Bandura et al., 1988). The belief in one's ability to complete a task has an effect on how threatening the task is perceived and the level of stress the task will cause. Bandura et al. (1988) found that when individuals perceived themselves as unable to exercise control over cognitive demands, they experienced high levels of stress, mental strain, and perceived cognitive impairment. Wiedenfeld et al. (1990) noted that an enhanced immunological response and a lower stress response accompanied high levels of self-efficacy. Rudolph and McAuley (1995) found that successful mastery experiences during acute exercise participation reduce biological stress responses. Chan (2002) reported that self-efficacy may offer support for task completion.

Although researchers have begun to discover the ability of psychosocial resources to buffer individuals from psychological stress and physical illness, there is still much to be understood. Very little research has been conducted on the role of psychosocial resources in buffering injuries and illnesses due to severe physical exertion. A stress-injury model, developed by Anderson and Williams (1988), is one of the first attempts to explain the role stress has on physical challenges and injury. According to this stress-injury model, when participants are put in a physically stressful situation, such as a demanding practice or a crucial competition, the participants' history of stressors, personality characteristics, and coping resources contribute interactively or in isolation to the stress response (Williams, 1996). Another possibility is that stress produces physiological arousal that increases muscle tension and reduces motor coordination and fluidity of motion, thereby increasing the risk of injury (Beuter & Duda, 1985).

Previous research findings suggest that psychosocial resources alter the cognitive appraisal of potentially threatening situations, thus helping reduce the physiological stress response (Andersen & Williams, 1988). This essentially provides protection for the mind and the body from a given stressor. Previous research also suggests the need to test the additive effect of psychosocial resources in order to better understand how these variables work together in the buffering process. Several psychosocial resources exist, but social support, mattering, and self-efficacy have been chosen for this research study because it is theoretically believed that these variables have an additive relationship.

When reviewing research in the areas of social support, mattering and self-efficacy, investigators (Bandura, 1991; Rosenberg & McCullough, 1981) mention the possible relationships of these resources and suggest further research. Previous empirical work

suggests that social support and mattering work together, and self-efficacy is partly based on social support (Bandura, 1991). Each is a type of psychosocial resource, but they are different conceptually. Rosenberg and McCullough (1981) found a strong empirical association between significant others (people who matter to us) and mattering (how much we perceive we matter to other people) when studying mental health among adolescents. “Although it is reasonable to assume that the social support and mattering are positively related to some degree, there may be cases where the two processes are not related at all” (Marcus, 1991a, p. 2). According to Marcus (1991a) we may receive support from others whose mattering to us, if at all, is minimal (e.g., the relationship between most charity cases and their benefactors). To test the independence of these two social resources, Marcus (1991b) correlated Backman’s (1972) measure of social support with the general mattering scale. The correlation was low (0.17), helping prove that mattering and social support are different constructs. Theoretically it is assumed that mattering is the obverse of the social support process and they often occur together, causing an additive effect. The relationship of these social resources requires further inspection.

According to Bandura (1991), self-efficacy can be influenced by social support (e.g., others’ beliefs and persuasion that an individual can accomplish a task). Because multiple additive resources have not been tested, the results from research on each individual variable may have actually been on the variable combined with others that were not tested. The suggestion that these three variables affect one another presents a strong possibility that the presence of all three may be important in trying to determine the combined resources one accesses when faced with a challenging situation.

Stress-Injury Model

The stress-injury model that was used as a theoretical basis for the present study was an extension of Andersen and Williams' model (1988). There are five main components in this stress-injury model: perceived stressor [expected stress of the Special Forces Assessment and Selection (SFAS) training program], cognitive stress response, outcome of the stressful situation-- physical outcome (injuries/illnesses), performance outcome (graduation from program/ medical withdrawal /voluntary withdrawal), and the psychosocial resources available to moderate the expected stress, cognitive stress response and physical and program outcomes. The stress-injury process works in several ways.

First, a situation is presented and an appraisal is made about how difficult and threatening the task will be for the individual (expected stress). If a threat is perceived (e.g., extreme physical challenge), the cognitive stress will manifest into a psycho-physiological response (tightening of the muscles, narrowed visual acuity, an increased release of cortisol, decreased immunological functioning, and a belief that one cannot accomplish the task). In turn, this negative response to stress can increase the likelihood of injury, illness, and possibility the dropout rates of a specific activity.

In this study the psychosocial variables in this model (social support, mattering and self-efficacy) were believed to intervene in the stress-injury process and act in three ways as buffers against the threat being posed. They were expected to influence the appraisal of the situation (expected stress), to moderate the cognitive stress response to the stressor, and/or to directly buffer the effect of the stressor on the outcome variables (physical and program outcome).

The focus of this study was on psychosocial resources, expected stress, cognitive stress response, self-report of injuries/illnesses, and program outcome. Due to practical limitations, physiological stress response was not examined directly in this study. Physiological stress response could not be included because of the researcher's inability to obtain the information needed to test this variable. Cortisol has been used in stress research in the past and is one of the most accurate measures of actual physiological stress. Cortisol is measured by the collection of blood or saliva, neither of which were available for this study, but may be tested in future research efforts in order to get an objective measure of soldiers' expected and cognitive stress response.

Stress-Injury model

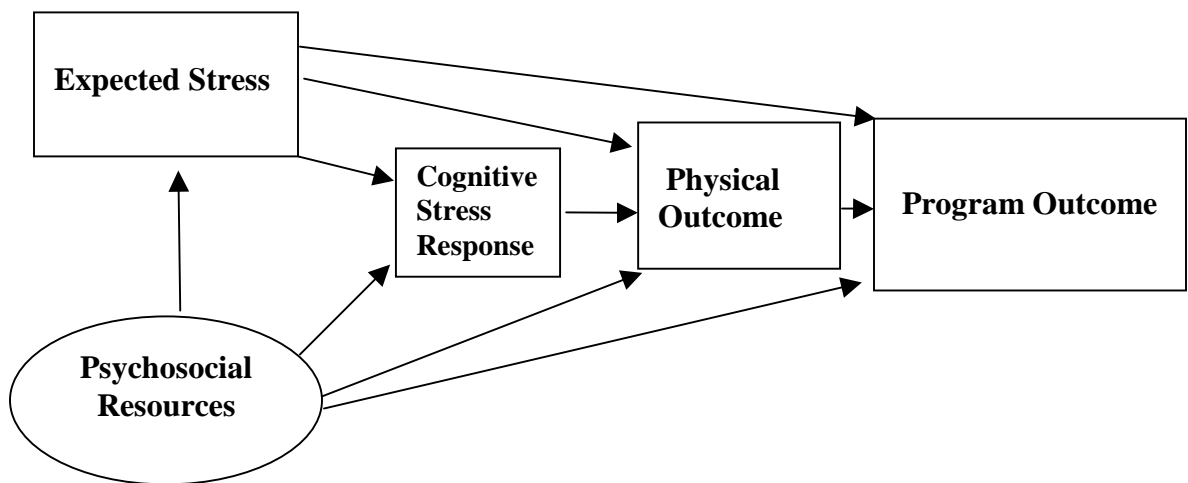


Figure 1

Statement of the Problem

Previous theory and research suggest that the combination of the three psychosocial factors discussed will act as a buffer in the stress-injury/illness process. This study was designed to test the ability of three specific psychosocial factors—additively and/or interactively—to buffer the negative effects of stress on injury and illness of soldiers when faced with a very difficult physical challenge and assist in task completion—the Special Forces Training and Assessment program.

This study attempted to answer the following questions: Is there a relationship between psychosocial resources and individuals' expectations of how much stress they will encounter during a physically challenging event? Is there a relationship between psychosocial resources (social support, mattering and self-efficacy) and individuals' cognitive stress response during a physically challenging task? Is there a relationship between psychosocial factors and the outcome measures (injury/illness, graduation, and medical or voluntary withdrawal from a physical challenge)? Is there a relationship between individuals' expected stress and their cognitive stress responses during a physical challenge? Is there a relationship between individuals' expected stress and the outcome measures?

Hypotheses

- Expected stress of the SFAS program will be directly related to the soldiers' cognitive stress response to the 24-day program. Soldiers with high levels of expected stress will have a higher cognitive stress response than soldiers with low levels of expected stress.
- Expected stress of the SFAS program will be directly related to the soldiers' physical outcome (injury and illness) of the 24-day program. Soldiers with high levels of expected stress will be more likely to have a higher number and greater severity of injuries and illnesses during the program than soldiers with low levels of expected stress.
- Expected stress of the SFAS program will be directly related to the soldiers' program outcome (graduation, or medical or voluntary withdrawal). Soldiers with high levels of expected stress will be more likely to medically or voluntarily withdraw and less likely to graduate from the program than soldiers with low levels of expected stress.
- Psychosocial resources will be directly related to the amount of stress the soldiers anticipate (expected stress) about participating in the SFAS program. Soldiers with high psychosocial resources will expect the program to be less stressful than soldiers with low psychosocial resources.
- Psychosocial resources will be directly related to the soldiers' cognitive stress response to the 24-day program. Soldiers with high psychosocial resources will

have a lower cognitive stress response than soldiers with low psychosocial resources.

- Psychosocial resources will be directly related to the soldiers' physical outcome. Soldiers with low psychosocial resources will have a higher number and greater severity of injuries and illnesses, when compared to soldiers with high psychosocial resources.
- Psychosocial resources will be directly related to the soldiers' program outcome (graduation, or medical or voluntary withdrawal). Soldiers with high psychosocial resources will be less likely to voluntarily or medically withdraw from the SFAS program and more likely to graduate, when compared to soldiers with low psychosocial resources.
- Psychosocial resources, expected stress, and cognitive stress will be significantly related to the soldiers' physical outcome. Soldiers with high psychosocial resources, low levels of expected stress, and low cognitive stress will have fewer and less severe injuries and illnesses during the SFAS program, compared to soldiers with low psychosocial resources and high levels of expected and cognitive stress.
- Psychosocial resources, expected stress, cognitive stress, and soldiers' injuries and illnesses (physical outcome) will be significantly related to the program outcome. Soldiers with high psychosocial resources, low levels of expected stress, low cognitive stress, and fewer and less severe injuries and illnesses will be more likely to graduate from the SFAS program, compared to soldiers with low

psychosocial resources, high levels of stress, and a higher number and greater severity of injuries and illnesses.

- Physical injury and illness (physical outcome) will be directly related to the program outcome. Soldiers with a higher number and greater severity of injuries and illnesses will be less likely to graduate from the SFAS program and more likely to voluntarily or medically withdraw from the program, when compared to soldiers with fewer and less severe injuries and illnesses.

Chapter 2

Literature Review

In the last several decades, military researchers have been dedicating their efforts to trying to understand soldiers and their military training experience. The current research efforts have focused on the reasons behind the reduction in military recruits, and an attempt is being made to decrease soldier attrition due to dropout and injury and illness—most of which occurs during training. “For most of 225 years the Army has lived with a high rate of injuries as cost of business” (Hoedebecke & Wells, 2002, p. 5).

Understanding and preventing injuries and illnesses in military personnel has always been a concern to military leaders. Because recruiting soldiers and retaining them has gotten increasingly difficult and the cost of training soldiers is high, a new effort is being made to find more effective ways to reduce the number of soldiers injured during training and deployment and to speed up recovery time.

Every branch of the military and their training programs are being negatively impacted by injury-and illness-related issues. The Marine Corps reports: “The annual fiscal and operational costs of recruit musculoskeletal injuries at Marine Corps Recruiting Depot San Diego were estimated at \$16.5 million and 53,000 lost training days” (Louk, 2002, p. 2). According to Louk (2002), due to the high rate of injuries (approximately 60% of recruits experience some form of musculoskeletal injury during training) and both money and training days lost, the Marine Corps has designed a program that focuses on injury recovery. A variety of disciplines (medical doctors, physical therapists) and therapies (medication, physical therapy, altered training programs) work together to prevent injuries and reduce the length of time soldiers are unable to participate in training

activities. According to Hoedebecke and Wells (2002), in 2001 and 2002, more than 8% of Army soldiers have been injured monthly; that equals approximately 38,000 soldiers per month. In 2001, over 6,400 active duty soldiers were released due to injury. The loss of soldiers due to a variety of injuries is very detrimental to the Army forces; the Army is losing the equivalent of one division of soldiers each year (Hoedebecke & Wells, 2002). One of the main objectives of the Accession Medical Committee is ensuring a healthy military force at a reasonable cost (Edmonson, 2002). In 1999, in an effort to reduce illnesses, the Navy designed the Reinforcing Education to Achieve Health (REACH) program. This program was designed to increase health promotion and the understanding of risk behaviors, healthy diet, and preventive measures (McGinley, 2002).

“The US Army is the strongest, most feared and most respected ground force in the world; the Army invests in each individual, developing soldiers who are strong in mind, body and soul” (Cavin, 2002, p. 3). “At the core of America’s strength is her ability to defend herself, therefore well trained, healthy military men and women are essential to a superior Armed Forces” (Hoedebecke & Wells, 2002, p. 1). In 1995 the Army developed a Physical Training Rehabilitation Program (PTRP) at Ft. Jackson, the Army’s largest basic training post. This program was designed to better understand the injuries accrued by the soldiers and review the physical therapy programs used to rehabilitate the injured soldiers and assess soldiers’ return to training (Werling, 2002). Over the past few years there have been advances in soldiers’ health, but a central effort to understand and reduce the epidemic of injuries has not been developed (Hoedebecke & Wells, 2002).

Although efforts have been made to understand what injuries occur during training, and useful physical therapy approaches to rehabilitate soldiers have been developed, there

is still little knowledge about the causes of these injuries. Some research has been conducted to understand the physical causes of injuries, such as injury control education and shoe studies, but little research has been conducted to determine whether psychological factors can affect injury and illness in military training environments. Researching the causes of injuries and illnesses and ways to prevent their occurrence has been increasingly important to the military due to reduced enlistment numbers, poor retention rates, and training costs. It is estimated that it takes about one year to train one Special Forces (SF) soldier and costs approximately \$100,000 (Clancy, 2001). The military, especially elite training programs such as SF, has a vested interest in increasing the graduation rate in all training programs and reducing the chance of losing individuals to preventable injuries and illnesses. In June 1999, the SFAS class started out with 236 students and only 78 successfully finished the program (Clancy, 2001). Special Forces have spent several years trying to determine what physiological changes cause injuries and illnesses and affect performance. Several research studies have been done measuring soldiers' stress response before, during, and after SF training in the hopes that new interventions can be introduced to the soldiers that will enhance performance and reduce attrition. Most of the research done relative to understanding performance in the Special Forces has been physiological in nature.

Research outside of the military environment has primarily focused on physical and environmental factors predisposing one to injury. However, psychosocial factors, including the influence of life stress on physical outcomes, have also received increased attention (Hanson et al., 1992). Over the last thirty years researchers have been looking for a relationship between life stress and injury. In a review published in 1993, Williams

and Roepke indicated that 18 of the 20 studies they reviewed found some type of positive relationship between high life stress and injury.

The Stress Response

The concept of stress is generally defined as “a nonspecific response of the body to any demand made upon it” (Selye, 1983, p. 2). There are four types of stress: hypostress, hyperstress, eustress, and distress. Distress is considered “bad stress” and is manifested in the form of anxiety or tension (Cox, 1998, p. 94). Stress, if perceived to be threatening (distress), can cause severe psychological and physical changes (Anshel et al., 2001). Stress is usually activated by a perceived threat and the body goes in to a state of “fight or flight.” The stress process is the body’s way of preparing for survival.

When a threat is perceived, the hypothalamus produces a hormone known as corticotropin releasing factor (CRF), which in turn notifies the pituitary and adrenal glands to push epinephrine, norepinephrine (NE), and cortisol into the bloodstream (Cowley et al., 2003). The purpose of these stress-related hormones is to prepare the body’s response to the perceived stressor by giving the organs necessary for fight/flight (heart, lungs) more glucose and oxygen and at the same time temporarily shutting down the processes that are not related to the stress response, such as digestion. These hormones also alert the brain and create a heightened state of awareness. If the individual remains stressed, the hormones will continue to be released and over time will cause negative effects on the body. The constant release of cortisol can affect the immune system and leave the body more susceptible to illness (Cowley et al., 2003). In military training and warfighting situations, it is unavoidable that soldiers will experience a severe stress response. Researchers studying soldiers enrolled in U.S. Army survival school

found that “exposure to acute, uncontrollable stress resulted in significant, robust increases in plasma catecholamines and cortisol across all subjects” (Morgan et al., 2001, p. 417). Researchers have also found that cortisol increases significantly while testosterone levels drop markedly during the U.S. Army survival course. A reduction in testosterone and an increase in cortisol can severely compromise the soldiers’ immune system. To deal with this problem, androgen/testosterone may be given to the soldiers (in a cream form) to help keep levels of testosterone up during strenuous training situations and missions. Furthermore, SF research identifies a relationship between “biological and psychological measures and performance in land navigation, shooting performance, and a variety of cognitive tasks involving visual and verbal memory and facial recognition” (Hazlett & Morgan, 2003 p. 30).

Long-term stress can also cause psychosomatic illnesses, and a person may have sleeping problems, headaches, and back pain, without a physical cause. Feelings of fear, irritability, and anxiety may also be elicited due to prolonged perceived stress (Cowley et al., 2003). Morgan et al. (2002) recently found that soldiers who had lower levels of morning cortisol and higher levels of evening cortisol were more likely to “burn out” compared to soldiers who did not experience this response. The activation of the stress response is often caused by the person’s perception of the situation. Sivik et al. (1997) found that soldiers’ stress was due to their psychological appraisal of their situation, and in turn it affected their physiological response (prolactin, cortisol, blood pressure, and hemoglobin). The appraisal process can easily be affected by many outside factors such as personality type, past experiences, and fatigue. Soldiers in particular are often faced with several factors that may affect their psychological appraisal of a situation, such as

severe sleep deprivation and fatigue. These factors can affect soldiers' concentration, strength, and decision making, creating situations where the soldiers are more susceptible to becoming injured. Because the psyche plays such an important role in the stress process, it is important to understand how the psychological appraisal of a situation leads to injuries/illnesses.

Most of the initial studies that have attempted to identify psychosocial risk factors focused on personality factors and life event stress, but offered no theoretical foundation to explain how these factors might lead to injury. This failure led Andersen and Williams (1988) to develop a multicomponent theoretical model of stress and injury. According to this stress-injury model, when an individual is faced with a physical challenge and put in a stressful situation, such as a demanding practice or a crucial competition, the person's history of stressors, personality characteristics, and coping resources contribute interactively or in isolation to the stress response (Williams, 1996).

The precise mechanism by which stressful events might increase vulnerability to injuries is unknown, but two mechanisms, one cognitive and one somatic, have been suggested. The first mechanism involves attentional disruption produced by preoccupation with stressful events and their possible negative consequences. This preoccupation could make an athlete less vigilant to environmental cues or less attentive to what they are doing, thereby increasing the risk of accidental injury (Andersen & Williams, 1988, p. 294).

The second possibility is that stress produces physiological arousal, which increases muscle tension and reduces motor coordination and fluidity of motion, thereby increasing the risk of injury (Beuter & Duda, 1985). As researchers better understand the stress-injury process, they have begun to investigate interventions that could buffer the effects of stress on athletes in the hopes of preventing injuries from occurring. In their research, Andersen and Williams (1988) discuss the possibility that during a stressful event, if the stress response is positively modified, the chance of an injury occurring may be reduced.

According to Bergandi (1985, p. 147), “the relationship between stress and injury appears to be firmly established, leaving the need to further identify other intervening variables involved in the injury process.”

Stress has a negative effect on one’s mental and physical health, and it can interfere with performance. Whether soldiers are training or actually involved in a combat situation, it is pertinent that they perform at optimal levels—anything less could be life threatening for themselves and those around them. It is necessary to keep each and every soldier healthy in order to have the strongest military possible. Several psychosocial resources have been explored in the past for their ability to buffer the stress response, but few studies have attempted to examine the effects of psychosocial resources during a task as physically and mentally challenging as a military training program. Next, this study reviews the most promising psychosocial resources (according to the previous literature findings) and examines how they affect soldiers’ psychological and physical states while training for an elite specialty in the U.S. Army known as the Special Forces.

Social Support

One resource receiving a great deal of attention for its ability to buffer stressors (Chan, 2002; House, Landis, & Umberson, 1988; Lu, 1997) and act as a coping resource (Bianco, 2001) is social support. Taylor (1986, p. 207) has defined social support as “information from others that one is loved and cared for, esteemed and valued, and part of a network of communication and mutual obligations.” Sarason et al.(1983, p. 127) defined social support as “existence or availability of people on whom we can rely.” Social support is the perception that there are people available to provide understanding, support, and caring on a daily basis, especially in a time of need. It is believed that social

support affects the cognitive process of the stress appraisal and the perception of the support available. Social support can help an individual appraise a stressful situation as less threatening and provide a buffer against the negative consequences of the stressor. When this process occurs, it helps the individual make a more positive assessment of the situation, reduces the stress, and provides better psychological health. Social support has been conceptualized as a coping resource that affects the extent to which a situation is appraised as stressful (Lazarus & Folkman, 1984) and enables a person under stress to change the situation, the meaning of the situation, or his or her emotional reactions to the situation (Thoits, 1986). Coping resource variables have been identified as important because athletes' coping abilities appear to have a direct bearing on their secondary cognitive appraisal of sporting situations (Petrie, 1993).

Social support can come in many forms and often from a variety of individuals. According to Feld (1981), the broadest possible social support network often includes all individuals with whom a person deals on a regular basis. An individual's friends and family are often the main source of support. Wellman (1992) suggests that Americans prefer to get help from parents in preference to friends, siblings, neighbors, extended kin, and acquaintances—in that order. “The bond between parent and adult child is the most supportive of all intimate and active ties, providing high levels of both material and emotional support” (Wellman, 1992, p. 215). Although family plays a significant role in providing support, depending on the circumstances, a person may receive much of his support from friends and teammates, or unit members.

This may be due to the closeness of the individuals, physically and emotionally, developing a special bond during their time together. When becoming part of a group,

individuals develop a sense of self-identity within their team/group/unit. They value, appreciate, and need support and feedback from team members on a regular basis. When an individual is injured, he expects the support of his team, leaning on them for reassurance and guidance through the healing process (Wellman, 1992). Proximity can also be a factor because friends are often closer than one's family during college years or military training. A relationship with immediate family members is often the most important relationship developed for most individuals, but during college an individual's relationship is often stronger with his current network (e.g., college friends). Friends who are also teammates may be better able to empathize with one's emotions about an injury because they understand the ramifications of the setback. According to Wellman (1992), people who do not have active kinship ties have one or two intimate friends acting like immediate kin by reliably providing a wide range of social support.

Social support is a complex interaction between two or more people, with parameters that are always changing. Two types of support have been identified: perceived support and received support. Before developing a model specifying the hypothesized relationship between social support and psychological well-being, it is necessary to specify the concept of social support. Heller and Swindle (1983) stated that the vagueness of the concept of social support may be responsible for the inconsistency in the findings concerning the buffering role of social support. "The distinction between perceived and received support is that perceived social support refers to the perception that social support is available if needed while received social support describes the social support that has been received by someone" (Cramer, Henderson, & Scott, 1997, p. 761). Perceived and received support can affect the social support system for the person

giving and the person receiving the support, affecting both parties' interpretation of the situation. Sarason et al. (1994), perceived social support to be a relatively stable schema, but according to Norris and Kaniasty (1996) several writers have noted that many stressful life events involve changes in social support. "The support one perceives he is getting can be influenced by structural developments in the helping network generated by characteristics of the event," (Norris & Kaniasty, 1996 p.507). Other factors that can complicate the giving and receiving of social support are the psychological distress a recipient is under, the threat to the recipient's self-esteem, and the supporters' inability to supply the necessary support for the current situation. There is also the possibility that the supporter will grow tired of offering support, especially when offering support to an individual who is angry or depressed.

To further complicate the process of social support, it is likely that during the recovery process, various forms of social support may be needed at different points (Wagner, Williams, & Long, 1990). The type of support and when it is needed are often determined on an individual basis and may change due to the needs of the recipient. Two main categories of social support have been identified: emotional support and instrumental support. Emotional support primarily provides intimacy, reassurance, and sharing confidences—words of comfort and support that help an individual feel better about a situation (Schafer et al., 1981). Cutrona (1990) suggested that emotional support is effective in reducing psychological distress and can thereby buffer individuals from experiencing negative affective states (e.g., anxiety or dysphoria) that prompt withdrawal of task efforts when things do not go well. According to Folkman and Lazarus (1980), instrumental support is a more task-focused support of another's instrumental striving,

such as giving advice or guidance that can aid problem solving. Instrumental support can come in many different forms, such as transportation, cooking, cleaning, or taking care of small tasks that make life easier and less stressful for the injured person.

Both emotional and instrumental supports are necessary forms of social support, although the amount and time of each may vary. The type of social support required depends on the individual, with some people responding better to emotional support when encountering difficult times and others finding instrumental support more helpful until they are able to take care of tasks on their own. Often, a person will require both emotional and instrumental support, first seeking emotional support to alleviate distress, and once he has absorbed the impact of the event, he seeks support that will help him to surmount the challenges presented by the event (Cantor & Harlow, 1994). For example, shortly after an injury, athletes may view emotional support (e.g., listening) as the most desirable form of support, whereas following surgery, tangible support (e.g., providing transportation) may be more desirable. The providers for both forms of support may be different, but both types of support are often offered by the same individual (usually someone close to the injured person) (Cantor & Harlow, 1994).

Men and women react differently to stressful situations and the type of support they may need. Allan (1989) found that women received more support than men, perhaps because women actively seek more support in times of crisis or they are usually more involved in social networks.

Mattering

In 1981 Morris Rosenberg, with the help of Claire McCullough, developed a concept called mattering. Mattering is defined as the extent to which people consider themselves significant to others (Marcus, 1991a; Schieman & Taylor, 2001). “Mattering is our belief that significant others (e.g., family, friends, colleagues) see us as important, an object of their attention, depend on us and are concerned with our fate” (DeForge & Barclay, 1997, p. 429). Mattering is a person’s feelings that he/she makes a difference in the world, and means something to those around him or her, especially those individuals of significance.

Mattering refers to the individual’s perception of how important he is to others; this may be in general terms or with regard to a specific individual, organization, or institution (e.g., spouse, school, community). The feelings that one matters to another individual or group may rest on different foundations: that one is an object of another’s attention; that what one thinks is of salient concern to another; that another individual is dependent on the subject. (Rosenberg et al., 1999, p. 4)

Rosenberg et al. (1999) describe the major interest in the concept of mattering as how important the individual feels he is to others in general or to a specific organization.

Two types of mattering have been identified in the literature, societal mattering and interpersonal mattering (Rosenberg & McCullough, 1981; Marcus, 1991a). According to Rosenberg and McCullough (1981), the two types closely correspond to Mead’s concepts of generalized and significant other.

Societal or global mattering refers to the feelings that one does or does not make a difference in the broader scheme of things: community, society, reference groups, etc., while interpersonal mattering focuses more on the feelings of being significant to specific others. (Marcus 1991a, p. 3)

Mattering is measured by inquiring about an individual’s beliefs about his significance to others; no attempt is made to corroborate this inference with the significant others’ opinions. Mattering is an inference about one’s significance to others

who are important to oneself (Marcus, 1991a ; DeForge & Barclay, 1997). “The conviction that one matters to another person is linked to the feelings that a.) one is an object of his attention, b.) one is important to him and c.) he is dependent on us” (Rosenberg & McCullough 1981, p. 163). “Mattering represents a compelling social obligation and a powerful source of social integration: we are bonded to society not only by virtue of our dependence on others, but by their dependence on us” (Rosenberg & McCullough, 1981, p. 165). According to Rosenberg and McCullough (1981), part of Durkheim’s (1951) explanation for the lower rate of suicide among married men and women, especially those with children, depended on this concept of mattering.

Although there is limited research on this concept, the available research suggests that mattering is important to all individuals—the sense of being needed and loved is important to all people. Rosenberg and McCullough (1981) report that mattering brings with it a sense of obligation, burden, and restriction of freedom. When others depend on us, worry about us, expect things of us, we are constrained and inhibited by these expectations. Although mattering seems to bring on a sense of obligation, a sense of mattering to others, either positive or negative, is important to one’s self-esteem and desire to complete a given task. For example, a drill sergeant may feel a strong sense of mattering to his recruits, and although this may not currently be a positive relationship, he understands they need his guidance and support to complete their required mission. In their research on adolescents, Rosenberg and McCullough (1981) found that mattering is important to youngsters, at least as far as self-esteem is concerned. The adolescents who believed they did not matter to their parents had lower self-esteem, engaged in more delinquent behaviors, and had higher levels of depression and anxiety. The type of

matterings, positive or negative, was not important; a sense of mattering to others is what affected the adolescents.

DeForge and Barclay (1997) measured the effects of mattering in a group of homeless men. They expected that general mattering would be low on the premise that homeless people are often seen as expendable and devalued by society. The results indicated that despite being homeless and disenfranchised from society, the homeless men in the study believed they mattered to others in the community. In a study conducted by Rosenberg et al. (1999), mattering was tested on Russian soldiers in the middle of a military downsizing. The results found a positive statistical correlation between mattering and mental health, indicating that for some of the soldiers, mattering to other people is related to positive mental health (e.g., the absence of anxiety and depression). Rohall and Segal (2001) also found similar results when conducting research on the effects of Russian army's organizational downsizing. In general, mattering has proven to be related to self-esteem (Pearlin & LeBlanc, 2001) and mental health (Rohall & Segal, 2001). Because the research to date focuses solely on the relationship between mattering and mental health, there is no literature on the possible effects of mattering on physical health. If mattering provides a buffer for psychological illnesses such as depression, it may be assumed that mattering also buffers physical injury/illness by changing an individual's cognitive response to the stressor and his subsequent physiological response. Further, if one feels what they are doing matters to others, it may help them to complete a task they perceive as important (in their mattering to others).

Self-Efficacy

A person makes decisions daily about what goals he intends to pursue, courses of action he is going to take, outcomes he wishes to achieve, and most important, his ability to achieve the intended goals. This belief in one's ability, which is known as self-efficacy, is a key element in the ability to achieve desired goals. "Self-efficacy refers to an individual's belief in his capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Bandura, 1991, p. 229). Self-efficacy refers to the self-confidence one has about his ability to complete a specific task. This self-confidence will affect the goals one pursues, his commitment to these goals, and the level of persistence he displays. Bandura (1991) notes that among the different mechanisms of personal agency, the most pervasive is one's belief in his capabilities and his control over environmental demands. Too often a person avoids situations he believes exceed his coping capabilities, but may take on and perform assuredly tasks he judges himself capable of successfully completing (Bandura, 1991). If a person has confidence in his ability to complete a given task, he will persist through adversity to obtain the desired goal.

According to Bandura (1991), there are four key methods to enhance one's sense of self-efficacy: (a) mastery experiences, (b) modeling, (c) social persuasion, and (d) physiological state. The information gained from these four methods depends on the individual's cognitive process (e.g., the information he attends to) and how important these methods are to an individual when determining his ability at a task. "The weight given to new experiences depends on the nature and strength of preexisting self-conceptions into which the new information must be integrated" (Bandura, 1991, p. 231).

Bandura (1991) tested recovering cardiac patients on their levels of self-efficacy and physical exertion. The results of this research found that a patient who increased his self-efficacy through all four sources of efficacy believed in his ability to exercise more, and he became more active in his everyday life compared to patients with less self-efficacy.

Each situation a person faces is evaluated and, depending on his self-efficacy pertaining to the situation-specific task, is determined to be threatening or nonthreatening. A perceived threat will affect the physiological response to the situation. According to Wiedenfeld et al. (1990), if a person believes he can exercise control over possible threats, he will not develop apprehensive cognitions and will not be stressed by the possible threats, but an individual who does not believe in his ability to control possible threats will experience a high level of stress. Self-efficacy gives an individual the ability to exercise control over his situation, plays a key role in the cognitive stress response, improves motivation (Bianco, 2001), and aids in task completion (Chan, 2002). Empirical research has found self-efficacy to play a major role in arousal level, perceived stress, and completion of a task, especially tasks of a physical nature (Bandura et al., 1988; Bandura, 1991; Wiedenfeld et al., 1990).

Buffers of Injury/Illness

The study of social relationships and health was revitalized in the middle 1970s by the emergence of a seemingly new field of scientific research on social support. Cassel and Cobb (1976) reviewed more than 30 human and animal studies that found social relationships protective of health (House, Landis, & Umberson, 1988). It is theorized that individuals with higher levels of social support experience less stress when confronted with stressful events and are able to cope better. There is also evidence that

social support both reduces the incidence of illness and enhances recovery from illness (Anthony & O'Brien, 2002; Cobb, 1976; Schaefer, Coyne, & Lazarus, 1981; Taylor, 1986; Wallston, Alagna, DeVellis, & DeVellis, 1983 as cited in Ievleva & Orlick, 1991).

The ability of social support to buffer stress and prevent injury, and help individuals during the healing process, is well documented (Doornbos, 1996; Harlow & Cantor, 1995; House, Landis, & Umberson, 1988; Sarason et al., 1983). Social support has previously been hypothesized to enhance health by reducing or preventing the psychological consequences of stress (Sarason et al., 1983). This is supported by Andersen and Williams' (1988, p. 303) belief that

the presence of a supportive social network (family, friends, coach, sports medicines staff, and teammates support) may directly inoculate the athlete against injury or may attenuate the stressfulness of life events and daily hassles as well as the stressfulness of athletic participation.

Gordon et al. (1998) noted that the interest in psychosocial and physical aspects of rehabilitation from injuries related to physically challenging activities has grown over the years and individuals who work closely with the athletes are in a position to provide needed social support.

Understanding the psychological component of injuries and applying the appropriate training for sports medicine personnel can be crucial for the support and recovery of many athletes. One study (Coddington & Troxell, 1980), although not specifically examining social support, found that football players who experienced family instabilities (e.g., separations, divorces, deaths) were more likely to become injured than those who did not. This could be interpreted as a disruption of the athlete's social support system (Andersen & Williams, 1988). Smith, Smoll, and Ptacek (1990) found that athletes who

scored low in both social support and psychological coping skills exhibited the strongest correlation between major sport-specific negative life events and subsequent injuries.

Other studies have found a similar life-stress buffering relationship between social support and physical injury (Hardy, Richman, & Rosenfeld, 1991; Petrie, 1993). Petrie (1993) found that football players with high negative life stress and low social support missed more games compared to players with low negative life stress and high social support. These findings support the hypothesized relationship in Andersen and Williams (1988) stress-injury model. Hanson, McCullagh, and Tonymon (1992) reported that social support was a significant discriminator of the severity of injuries that occurred to the athletes they studied. Williams and Andersen (1998) found that low social support played a role in an increase in injury frequency.

There is a variety of documentation that suggests that social support not only prevents injury, but also plays a role in recovery from illness and injury (Wagner, Williams, & Long, 1990). A 1990 study conducted on head trauma and social support by Wagner, Williams, and Long reported that specific social network variables seem to correlate highly with patients' level of functioning. Duda et al. (1989) found that social support affected the motivation of injured athletes to adhere to their rehabilitation program. The exact function that social support provides during injury is not clear because it varies from person to person and depends on the needs of the person, the ability of the supporter to provide the appropriate support, and the will of the injured person to recover.

The type of social support (emotional or instrumental) can change in type and intensity over the course of a person's recovery. It is common that the first response of

an injured athlete is one of anger and hostility and that it later turns into despair and depression. Pearson and Jones (1992) reported that injured athletes were significantly more hostile, tense, depressed, unsure, tired, and confused than their noninjured counterparts.

Very little research on social support has addressed the role of social support and gender. Hardy, Richman, and Rosenfeld (1991) found that male athletes with high negative life events had a decreased injury rate when the number of social support providers and the degree of fulfillment of support for an emotional challenge increased. The researchers concluded that social support was effective with the male athletes only to the degree that a match exists between the stressor and the support type. Hardy, Richman, and Rosenfeld (1991) also studied female athletes but found no relationship between social support and injury frequency and severity.

There has been very little research conducted on the ability of mattering to act as a buffer to injury and illness or aid in task completion, but previous research suggests that mattering may play a part in mental health, psychological well-being, self-esteem, and possibly physical health (Marcus, 1991b; Pearlin & LeBlanc, 2001; Rohall & Segal, 2001; Rosenberg & McCullough, 1981; Rosenberg et al., 1999; Taylor & Turner, 2001). “If the very definition of ourselves is based on others’ perceptions of us, then the feeling that we matter to them may strongly affect our psychological well-being” (Marcus, 1991a, p. 4). Self-efficacy research has shown the ability of self-efficacy to reduce stress, increase self-esteem, and provide perceived control over a task (Bandura, 1977; Bandura, 1991; Bandura et al., 1988; Wiendfield et al., 1990), but the research is limited on self-efficacy’s ability to buffer injury and illness.

The additive effects of psychosocial variables in the prevention of injury and illness are limited and there is currently no research on the additive effects of social support, mattering, and self-efficacy. Anshel et al. (2001) report that attempts to understand the coping process in physically challenging activities have received only scant attention in the sport psychology literature. Little is known about the effects of these resources in the athletic community, and even less is known about the relationship between these resources and the physically grueling challenges faced by the military, particularly during training and deployment. The fact that these three variables are related to one another creates the possibility that they are synergistic in nature. Therefore, there is a strong possibility that the combination of all three of the psychosocial resources may provide more support than any one resource can provide alone; the effects of these variables combined deserves further review.

Summary

The current literature addressing psychosocial resources (social support, mattering, and self-efficacy) primarily focuses on the psychological protection the resources provide individually. The current literature has identified these resources as effective in buffering negative psychological states (Bandura, 1991; Bianco, 2001; Chan, 2002; House, Landis, & Umberson, 1988; Pearlin & LeBlanc, 2001; Rohall & Segal, 2001; Wiedenfeld et al., 1990). However, there is no literature examining the combined effects of these psychosocial resources on a person's physical or psychological well-being. Although researchers have suggested theories about the effects of each of these psychosocial resources, there is no empirical data about the combined effects of these resources, particularly in the military literature. Currently, the research relative to military training focuses on injury recovery (Louk, 2002) and the promotion of healthy behaviors (McGinley, 2002). There has also been an effort to modify military equipment in the hope of reducing injuries, but a combination of psychosocial resources as buffers in the stress and injuries/illnesses process, ultimately leading to successful program completion, has not yet been addressed.

The present investigation attempts to determine whether there is an additive effect of these three psychosocial resources on the stress response, physical injuries/illnesses, and task completion. The soldiers entering the SF training program are highly conditioned physically, but more than one third of soldiers do not successfully complete the training program—proving that there is more involved in successful completion of the program than a soldier's physical fitness.

Chapter 3

Method

Participants

This study originally consisted of 380 male Army soldiers in the May 2002 SFAS training class. This was a convenience sample and utilized only soldiers enrolled in the SFAS program. Participation in the SFAS program was voluntary. The average age for the May 2002 SFAS class was 25.8 (SD 1.5), and their highest level of education was 12.9 years (mean; SD 1.5) (see Table 1).

All of the soldiers must have met certain requirements to enter the SFAS program, including taking the Army Services Vocational Aptitude Battery (General Technical) with a score of 100 (cognitive ability test), and an Army Physical Fitness Test (pull-ups, sit-ups, running events) with a score of 229 or higher. There were also rank restrictions. Enlisted soldiers had to have been one of the following ranks: private (E-1 or E-2), private first class (E-3), corporal (E-4), sergeant (E-5), staff sergeant (E-6), or sergeant first class (E-7). Officers had to have been first lieutenants (O-2) or captains (O-3). In this study, 72% of the soldiers were corporals and sergeants. The soldiers were all given a psychological evaluation and must have been declared psychologically fit by a doctor prior to entering the SFAS program. The participants could not have any personnel actions in progress and could not have a history of legal actions against them. Individuals entering the SFAS program were considered the best of their unit and were recommended by someone of superior rank.

Special Forces Assessment and Selection Program

SF soldiers are commonly referred to as Green Berets. Their military participation is for infantry-oriented, combat arms units with special, often dangerous missions. They are expected to quickly respond to a variety of situations throughout the world, operating alone or in coordination with other military forces (Brooks, 1997). “Special Forces differ from conventional forces in that they are specially organized, trained, and equipped to achieve military, political, economic, or psychological objectives by unconventional means” (Brooks, 1997, p. 4). SF soldiers are often required to travel long distances by foot carrying heavy supplies, work on few hours’ sleep, and work independently in very dangerous situations. According to Clancy (2001), SF soldiers spend roughly six months a year away from home, are paid little, and have a good chance of being injured or killed.

In the late 1980s, SFAS was a program designed to better assess the suitability of Army soldiers for further training and participation in the SF (Zazanis, 1997). The selection system for the SF is a multiple-hurdle approach that is both physically and mentally demanding, and the SFAS program is the first attempt to assess if a soldier is able to enter training for SF. The SFAS program is a 24-day assessment that emphasizes requirements such as physical strength, endurance, and motivation. Army soldiers must first pass the SFAS program before they can advance to SF training.

The soldier must be able to hike several miles a day, carry a 60-pound sack on his back, march, run, and climb.

During the 24-day assessment the candidates will suffer sleep deprivation, limited rations, and physical exertions bordering on the inhuman. At the same time they will be required to demonstrate fieldcraft skills, mental toughness, and most of all, the refusal to give up. (Clancy, 2001, p. 71)

During the 24-day assessment, the soldiers are evaluated objectively (time/distance of runs and ruck marches) and subjectively (evaluation of abilities, and personal characteristics) (Zazanis, 1997). During the 24-day training all of the soldiers are expected to encounter the following:

- **Obstacle Courses:** The obstacle courses include barriers, walls, climbing, and underground travel.
- **Runs:** The runs are composed of high-impact aerobic activity; some of the runs are very long, whereas other runs are more of a sprint.
- **Marches:** There are dozens of marches within the 24-day SFAS training.
- **Land Navigation/Fieldcraft:** Land navigation requires maneuvering through all types of weather, day and night, with just a compass, protractor, and map. The soldiers are expected to be able to navigate their way in any situation.
- **Situation and Reaction:** After being deprived of sleep, all of the soldiers are presented with a variety of situations and must come up with a solution to solve each one with very little in the way of resources.
- **Team Events:** The team events are designed to test each soldier's ability to work with others. Again, situational tests are given and each team must come up with a solution.

The SFAS program is designed to provide a raw test of body, mind, and soul for the soldiers and determine whether they will be worth the time and money to continue the SF training (Clancy, 2001). It is estimated that one in four who meet the initial prerequisites actually become SF soldiers, and the largest amount of attrition occurs during the SFAS program (Brooks, 1997). Because the attrition rate is so high, the goal of researchers

studying the SF is to identify factors that predict success in SFAS. In doing so, researchers are better able to assess which soldiers have the best chance of making it into the SF and can then make better selection assessments; the information can also be used to help potential applicants prepare for SFAS. “The advantages of identifying the individual characteristics critical to field performance are substantial, and ultimately could enhance troop readiness and performance through better recruitment, selection and training programs” (Diana, Kilcullen & Goodwin 1997, p. 53).

Design and Variables

Variables

Three psychosocial resources (social support, mattering, and self-efficacy) served as the main independent variables. Each participant completed a questionnaire designed to assess the level of psychosocial resources he possessed.

Expected stress of the SFAS program served as both an independent and dependent variable. When examining the effects of psychosocial resources on expected stress, expected stress served as a dependent variable. When examining the effects of expected stress on cognitive stress response, physical outcome (injury or illness) and program outcome, expected stress served as an independent variable.

Cognitive stress response served as an independent variable when examining the effect it had on physical outcome due to the SFAS program and program outcome. When examining the effects that expected stress and psychosocial resources had on cognitive stress, cognitive stress served as a dependent variable.

The physical outcome variable served as one of the two main dependent variables. When looking at the effect that expected stress, psychosocial resources, and cognitive stress response had on injury and illness, injury and illness served as a dependent variable. However, injury and illness served as an independent variable when examining the relationship between injury and illness and the second main outcome variable, program outcome (graduation, medical withdrawal, voluntary withdrawal, and other). Program outcome served as the main dependent variable.

Procedure

On the first day of the SFAS program the soldiers filled out a variety of questionnaires administered by Army personnel at the Ft. Bragg military installation in North Carolina, 25 questions of which pertained to this study. The 25 questions pertinent to this research measured soldiers' expected stress, social support, mattering, and self-efficacy. The social support questions were based on a questionnaire originally developed by Sarason (1983) and measured the social support each soldier perceived he had available. Mattering was assessed through a modified version of the mattering scale (Rosenberg et al., 1999). This scale measured how much the soldiers' perceive they mattered to others. Chen, Gully and Eden (2001) developed the general self-efficacy questions used in this research that measured each soldier's belief in his capabilities. Research psychologists at the Army Research Institute (ARI) and this author developed the expected-stress questions (these questions were given out before the training began so the soldiers' anticipated stress about the upcoming training could be measured).

Army personnel administered the questionnaire that included the social support, mattering, self-efficacy, and expected stress questions on the first day of the SFAS

program. The soldiers were informed that their participation in the SFAS program was completely voluntary. The 25 questions took approximately fifteen minutes for instruction and completion. No further instructions were given.

A questionnaire containing seven questions measuring the soldiers' cognitive stress response was given five days into the SFAS program by SF military personnel. A modified version of the Perceived Stress Scale (PSS) by Cohen, Kamarck, and Mermelstein (1983) was used. The questions measured the soldiers' perceived level of stress. This stress questionnaire was designed to measure the cognitive stress the soldiers felt during the SFAS training, whereas the expected-stress questions given before the soldiers started SFAS measured how stressful they expected the training to be. The questionnaire took approximately 10 minutes for instruction and completion.

A final self-report questionnaire was completed by the soldiers at the end of their training and inquired about any injuries they may have received, illnesses, the severity of their injuries/illnesses, and visits to see medical personnel. This questionnaire was created by research psychologists at the ARI and is used often during SFAS data collection. Although it was anticipated that all of the soldiers would fill out this questionnaire, only 92 of the soldiers included in this study actually filled out and turned in the injury and illness questionnaire.

All of the completed questionnaires were returned to the Army personnel at Ft. Bragg and forwarded to ARI personnel in Alexandria, Virginia. At the end of the 24-day SFAS program, Army personnel released information to the ARI about the outcome of each soldier's training. There were four possible program outcomes: a soldier could graduate from the SFAS program, be medically withdrawn from the SFAS program (this was

determined by a medical doctor at Ft. Bragg), voluntarily withdraw from the SFAS program, or other (made up of a variety of reasons). Data pertaining to the soldiers' Army Physical Fitness Test (APFT) scores and each soldier's social desirability responses were also collected by the ARI and released to this author. The personal information on all of the data was replaced with numbers matching each soldier's questionnaire with his outcome information (graduation, medical withdrawal, voluntary withdrawal, or other). Because this was a secondary data analysis, the data were released to this researcher only after all sensitive personal data were removed (social security numbers) from the questionnaires. There was no way to identify, either directly or indirectly, specific individuals. University of Maryland IRB approval was granted before the study began.

Instrumentation

Measurement of Social Support

Social support was assessed through a modified version of the social support questionnaire (SSQ) originally developed by Sarason (1983). The questionnaire (Appendix A) contained items regarding social support in order to establish a quantitative measure of this variable. There were eight items that measured the perceived amount of social support available to each participant. Response categories on each social support item originally ranged from "great extent" to "not at all," with numerical values of 1 through 5 assigned to each response. The items were then reverse scored so that a high score indicated that an individual felt he had a great deal of social support and a low score indicated that he had little or no support. According to Sarason et al. (1983), the

SSQ has been proven reliable as the alpha scores for the SSQ were all above 0.80. The items in the SSQ were highly correlated—most had correlations greater than 0.70.

Validity data were based on several comparisons between the SSQ and other related variables such as: Multiple Adjective Affect Check List (MAACL), the Eysenck Personality Inventory (EPI), and the Life Experience Survey (LES). There were significant negative correlations at the $p < 0.001$ level between social support and anxiety (-0.39), depression (-0.43), hostility (-0.36), and neuroticism (-0.37). A positive correlation was found between social support and extraversion (0.35). These results were consistent with empirical and theoretical evidence that people with less social support may be more depressed, anxious, hostile, and neurotic than people with high social support. According to Sarason et al. (1983), the findings for the LES are consistent with evidence reported by Lefcourt, Miller, Ware, and Sherk (1981) and Sandler and Lakey (1982). People who have a high number of social supporters may experience more rewarding interpersonal relationships than do people who have a low number of social supporters.

In the present study one item from the social support scale was deleted from the data analysis. The social support question, “To what extent do you have people to calm you down when you are upset,” was deleted. The deletion of this question increased the alpha reliability from 0.71 to 0.76.

Measurement of Mattering

Mattering was assessed through a modified version of the mattering scale (Rosenberg et al., 1999). This questionnaire (Appendix B) asked questions regarding mattering in order to establish a quantitative measure of mattering. There were six items

to measure this variable, five general mattering questions, and one mattering-to-the-Army question. Response categories for each mattering item originally ranged from “great extent” to “not at all,” with numerical values of 1 through 5 assigned to each response. The items were then reverse scored so that a higher score indicated that an individual felt he mattered a great deal to others, a lower score that he did not matter to others.

The alpha scores, according to Rosenberg et al. (1999), for the mattering scale ranged from 0.81 to 0.88 and thus indicated a high degree of reliability. Marcus (1991a) conducted a factor analysis of the general mattering questions originally created by Rosenberg and McCullough (1981), the results of which revealed only one significant factor. All five items loaded strongly on this factor, which accounted for 66% of the total variance. Marcus (1991b) also compared the general mattering scale to Backman’s (1972) social support scale. The resultant correlation was low (0.17). The low correlation between the general mattering scale and social support supports the theoretical distinction and usefulness of the general mattering scale (Marcus, 1991b). In the present study the alpha reliability was 0.71.

Measurement of Self- Efficacy

Self-efficacy was assessed through the new general self-efficacy (NGSE) scale developed by Chen, Gully and Eden (2001). The questionnaire (Appendix C) asked questions regarding self-efficacy in order to establish a quantitative measure of self-efficacy. Self-efficacy was operationally defined as one’s belief in his capabilities to have the cognitive resources needed to meet given situational demands. There were eight items measuring the participants’ perceived level of self-efficacy. Response categories on each self-efficacy item originally ranged from “strongly agree” to “strongly

disagree,” with numerical values of 1 through 5 assigned to each response. The items were then reverse scored so that a higher score indicated that an individual had more self-efficacy and a lower score indicated that he had less self-efficacy.

The alpha scores, according to Chen, Gully and Eden (2001), ranged between 0.85 to 0.91, indicating a high degree of reliability. They compared their self-efficacy scale in numerous studies to previous self-efficacy scales and found that “it yielded appreciably higher content validity and somewhat higher predictive validity compared to the commonly used general self efficacy scale created by Sherer et al.” (Chen, Gully & Eden, 2001, p.77). The results of Chen, Gully and Eden’s (2001) research showed that the new self-efficacy scale is a more valid measure of general self-efficacy than the general self-efficacy scale created by Sherer et al. In the present study the alpha reliability was 0.86.

Measurement of Psychosocial Resources

The psychosocial resource variable was created using the combined means of the social support, mattering and self-efficacy results. On a scale of 5 through 1, a higher score indicated that an individual had more psychosocial resources and a lower score indicated that he had fewer psychosocial resources. The alpha reliability of the psychosocial resource variable was 0.86.

Measurement of Expected Stress

Expected stress was based on each soldier’s perception of how much stress he expected to encounter during the SFAS training program. This was measured by a self-report questionnaire (Appendix D). Altogether, there were three questions measuring the soldiers’ expected stress levels. Expected stress was measured using a Likert-type scale (“extremely stressful” to “not at all stressful”), with numerical values of 1 through 5

originally assigned to each response. The items were then reverse scored so that a higher score indicated that an individual expected the SFAS program to be more stressful; a lower score indicated that he believed the program was not going to be stressful. The alpha reliability for the expected-stress measure composed of the three items was 0.76.

Measurement of Cognitive Stress Response

A modified version of the PSS by Cohen, Kamarck, and Mermelstein (1983) was used. The questionnaire (Appendix E) contained items regarding cognitive stress in order to establish a quantitative measure of this variable. There were seven items to measure the participants' perceived level of stress. A Likert-type scale ("almost always" to "hardly ever") was used, with numerical values of 6 through 1 assigned to each response. A high score indicated that an individual felt a great deal of stress; a low score indicated that an individual felt little or no stress.

The alpha scores for the PSS were all above 0.84 (Cohen et al., 1983). Cohen et al. (1983) also found the PSS correlated significantly (0.20 to 0.39, $p < 0.01$) with several other preexisting instruments that measure the construct of stress (Life-Event Scale and CES-D). In addition, they reported the PSS to be a better predictor of various health outcomes than other life-event instruments. In the present study the alpha reliability was 0.66.

Measurement of Physical Outcome (Injury and Illness)

Questions from the medical questionnaire developed by Wisecarver and Kilcullen (2000) at the ARI were used. The questions (Appendix F) regarding injury and illness established a quantitative measure of the injuries and illnesses soldiers endured during

SFAS training. Physical outcome was measured in two ways: by the number of injuries/illnesses and by the severity of the injuries/illnesses soldiers reported. There were two medical questions that measured the number of soldiers' physical injuries and illnesses. These two questions gave the soldiers the ability to choose all of the injuries and all of the illnesses they had incurred during training. One had nine possible injury choices and the other had six possible illness choices. Each injury and illness choice was coded 0 = no injury or illness or 1 = injury or illness. The overall numbers of injuries (e.g., back, neck, leg) and illnesses (e.g., cold, flu, allergies) were added up together to create the injury/illness variable. A score of 0 indicated that the soldier reported not having any injuries and illnesses; a high score indicated that the soldier reported several injuries and illnesses. Severity of the injuries and illnesses reported was measured using two of the medical questions. A Likert-type scale ("none" to "severe or entire time") with numerical values of 0 through 5 was used for each question. The mean of the responses was then calculated. Zero was the lowest possible score, indicating that the soldier did not experience any aches/pains. The highest possible score was five; the higher the number chosen, the more pain/severity the soldier perceived. In the present study, the alpha reliability for the severity item was 0.72.

SFAS Program Outcome

The program outcome—the second criterion outcome—was operationally defined as the final results of the SFAS program. Program outcome consisted of four possible outcomes. The outcome variable was coded as follows: graduation from the SFAS program equaled 4, voluntary withdrawal from the SFAS program equaled 3, and medical withdrawal from the SFAS program equaled 2. Any

outcome other than graduation, medical withdrawal, or voluntary withdrawal equaled 1. The “other” outcome category encompassed soldiers that were dropped from the SFAS program due to reasons such as conduct issues, cheating, or board disqualifications, which did not overlap the previously defined categories. Thus, this category captured a variety of reasons why soldiers did not complete the program. The SFAS staff of commanders and medical doctors determined the final outcome of each soldier for the graduation variable, medical withdrawal variable, and other variable. The individual soldiers themselves made the decision to voluntarily withdraw from the SFAS program.

Control Measures

In order to control for soldiers’ physical fitness levels and measure social desirability of the responses, physical fitness and social desirability information were used from data gathered on these soldiers prior to the SFAS training. The physical fitness and social desirability data were collected by the Ft. Bragg military psychologists, given to the ARI research psychologists, and then passed on to this researcher.

Measurement of Physical Fitness

The Army Physical Fitness Test (APFT) consisted of sit-ups, push-ups, and a 3-mile run. Each soldier took this test before entering the SFAS program and had to receive an overall score of 229 or higher to qualify for the SFAS program. Individuals whose physical fitness scores were below 229 or who had no fitness score reported in this dataset, a total of 54 subjects (13 individuals missing fitness scores and 41 individuals removed because their score was below 229), were deleted from the analyses. For this study, the mean APFT score was 265 with a standard deviation of 20.

Measurement of Social Desirability

The Biodata Faking Good scale was used to measure social desirability. The Army has used this scale regularly for several years. According to Kilcullen, White, Mumford, and Mack (1995), the Biodata Faking Good scale has shown strong convergent validity with social desirability scales used in previously validated personality measures. This test identified whether soldiers were “faking good” on the questionnaires. Individuals who were identified in the present study as responding with high social desirability responses (above 0.30) or missing social desirability scores were removed from the analyses; a total of thirty subjects (15 subjects missing a social desirability score and 15 subjects removed because their score was above 0.30). The scores for the social desirability scale range from 0.00 to 1.00; the higher the score, the more the soldier was “faking good.”

The reliability of the Biodata Faking Good scale is 0.45. This does not reflect a problem with this lie scale—all lie scales have low reliabilities. This is due to the fact that there is almost no variability within the scale and that these items cannot correlate highly with anything else, including other items within its own scale; therefore, lie scales tend to have low alphas. One of the criteria for removing lie items is an endorsement rate (i.e., variance) that is too high. When 40% of the subjects trigger a lie item, it is almost always because the item is not measuring deliberate lying but instead is measuring something else.

Data Analysis Plan

Several statistical analyses were employed to test the hypotheses in this research study. Separate multiple regressions were conducted to determine the individual

relationships between psychosocial resources and other variables of the study (expected stress, cognitive stress, and physical outcome). Regressions were also conducted to examine the contributions of expected stress to the soldiers' cognitive stress response and physical outcome. In addition, two separate multinomial logistic regressions were conducted to examine the relationship between psychosocial resources and program outcome, and expected stress and program outcome. A multinomial logistic regression was also conducted to further examine the individual effect of the three variables that made up the psychosocial variable (social support, mattering, and self-efficacy) on program outcome. Multinomial logistic regressions were employed because the independent variables were continuous and the criterion variable was categorical. Soldiers' levels of physical fitness and social desirability responses were controlled for throughout all of the analyses.

For this study power was determined using Cohen's 1992 power analysis table. For a medium effect size, at the 0.05 alpha level with five independent variables (the most variables concurrently tested during this research effort, including the 2 control variables), 91 subjects were needed. For four independent variables, 84 subjects were needed for sufficient statistical power.

In the present study multicollinearity was tested and found to be nonsignificant for the psychosocial variables (social support, mattering, and self-efficacy). Collinearity statistics were conducted for each analysis. None of results were found to be highly collinear between any of the independent variables. The tests for multicollinearity found high tolerance (0.80) and very low (1.2) variance inflation factor (VIF) values. According

to Motulsky (2003), any VIF value above 4.0 (very conservative value) indicates possible multicollinearity. This was not the case for any of the analyses conducted in this study.

Chapter 4

Results

The purpose of this investigation was to examine the relationships between Army soldiers' psychosocial resources, stress levels, and injury/illness rates and their ability to complete the Army SFAS program. Specifically, this study sought to determine whether the psychosocial resources would buffer the negative effects of a physically challenging and stressful event and help with task completion.

Descriptive Statistics

Descriptive statistics are presented in Table 1, reporting the mean and standard deviation for each continuous variable (including demographic information about the soldiers). It should be noted that the mean for the variable 'number of injuries/illnesses' was quite low. A possible explanation for this is that the soldiers may have experienced one severe injury versus multiple different injuries. Table 2 reports the zero-order correlations for all 13 of the variables and their interrelationships. The correlations suggest that there is a significant relationship between soldiers' expected stress about the SFAS program and their cognitive stress response during the program. The results also indicate a relationship between the soldiers' psychosocial resources and the program outcome. There is a positive relationship between soldiers' psychosocial resources and their ability to graduate from the SFAS program and a significant negative relationship between soldiers' psychosocial resources and voluntary withdrawal from the program. Although the psychosocial variables correlated significantly among themselves, only one of them (self-efficacy) had a significant relationship with the cognitive stress response. Expected stress was also correlated with cognitive stress response. The severity of

injuries and illnesses correlated positively with cognitive stress response and social support. Physical fitness correlated positively with psychosocial resources and graduation, but negatively with voluntary withdrawal.

Table 1

Means and Standard Deviations for All of the Demographic, Independent and Dependent Continuous Variables in the Study		
Variable	M	SD
1. Age	25.80	1.50
2. Education	12.90	1.50
3. Social Support	3.90	0.53
4. Mattering	3.70	0.52
5. Self-Efficacy	4.50	0.42
6. Psychosocial Resources	4.00	0.40
7. Expected Stress	3.50	0.75
8. Cognitive Stress	1.80	0.52
9. Number of Injury/Illness	1.65	1.30
10. Severity of Injury/Illness	2.12	1.02
11. Physical Fitness	265.00	20.00
12. Social Desirability	0.03	0.07

Table 2

Zero Order Correlations for All Independent &
Dependent Variables in the Study

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Social Support	-----												
2. Mattering	0.48***	-----											
3. Self-Efficacy	0.46***	0.48***	-----										
4. Psychosocial Resources	0.82***	0.82***	0.77***	-----									
5. Expected Stress	0.03	0.118	-0.04	0.05	-----								
6. Cognitive Stress	0.03	0.016	-0.13**	-0.02	0.20***	-----							
7. Number of Injury/ Illness	0.04	0.08	0.03	0.06	-0.00	0.11	-----						
8. Severity of injury/illness	0.27***	0.02	0.13	0.17	-0.04	0.23**	0.46***	-----					
9. Graduation	0.17***	0.14**	0.26***	0.23***	-0.09	-0.07	-0.14	0.07	-----				
10. Voluntary Withdrawal	-0.09	-0.08	-0.20***	-0.15**	0.04	0.10	0.06	0.15	-0.57***	-----			
11. Medical Withdrawal	0.03	0.05	0.01	0.04	-0.04	-0.00	-0.05	-0.05	-0.25***	-0.17***	-----		
12. Physical Fitness	0.05	0.14**	0.15***	0.14**	-0.07	-0.08	0.09	-0.03	0.12**	-0.12**	0.04	-----	
13. Social Desirability	0.15***	0.11**	0.13**	0.16***	-0.00	-0.17***	-0.15	-0.10	0.01	-0.09	0.03	0.04	-----

*p < 0.10. **p < 0.05. ***p
< 0.01.

Expected Stress and Cognitive Stress Response

The first analysis tested the hypothesis that there is a positive relationship between expected stress and cognitive stress response. (Of the 380 subjects, data for 272 subjects were available). A linear regression was used to test this relationship. Physical fitness and social desirability indices were entered first so that their effects could be controlled, followed by expected stress. The overall effect for the model was significant $F(3,268) = 7.17, p < 0.01, R^2 = 0.07$, and the beta value for expected stress was significant, $\beta = 0.20, p < 0.01$ (see Table 3). These results supported the hypothesis that soldiers' expected stress for the SFAS program was directly related to their cognitive stress response to the 24-day program: soldiers with higher expected stress had a higher cognitive stress response than soldiers with lower expected stress. There was also a significant effect of social desirability ($\beta -0.16, p < 0.01$). The social desirability results suggest that subjects' responses to the cognitive stress items were affected by social desirability.

Table 3

Summary of Regression Analysis Testing the Relationship Between Expected Stress and Cognitive Stress (N = 272)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-1.31	0.47	-0.16***		
Physical Fitness	-0.00	0.00	-0.06		
Independent Variable					
Expected Stress	0.14	0.04	0.20***		
Overall Model				0.07	7.17***
*p < 0.10. **p < 0.05. ***p < 0.01.					

Expected Stress and Physical Outcome: Number of Injuries/Illnesses

This analysis tested the hypothesis that there is a positive relationship between expected stress and the number of injuries and illnesses soldiers experienced. (Of the 380 subjects, data for 92 subjects were available). A linear regression was used to test the hypothesis. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by expected stress. No significant relationship was found between expected stress and number of injuries/illnesses as evidenced by a nonsignificant regression model (see Table 4). Thus, the hypothesis was not supported when controlling for physical fitness and social desirability.

Table 4

Summary of Regression Analysis Testing the Relationship Between Expected Stress and Number of Injuries/Illnesses (N = 92)					
Predictor Variable	B	SE B	β	Total	F
Control Variables					
Social Desirability	-3.11	2.12	-0.16		
Physical Fitness	0.00	0.01	0.03		
Independent Variable					
Expected Stress	0.01	0.18	0.01		
Overall Model				0.02	0.73
*p < 0.10. **p < 0.05. ***p < 0.01.					

Expected Stress and Physical Outcome: Severity of Injuries/Illnesses

This analysis tested the hypothesis that there is a positive relationship between expected stress and soldiers' perceived severity of their injuries/illnesses. (Of the 380 subjects, data for 92 subjects were available). A linear regression was used to test the hypothesis. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by expected stress. No significant relationship was found between expected stress and severity of injuries/illnesses as evidenced by a nonsignificant regression model (see Table 5). Thus, the hypothesis was not supported when controlling for physical fitness and social desirability.

Table 5

Summary of Regression Analysis Testing the Relationship Between Expected Stress and Severity of Injuries/Illnesses (N = 92)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-1.50	1.70	-0.10		
Physical Fitness	-0.00	0.01	-0.02		
Independent Variable					
Expected Stress	- 0.05	0.14	-0.04		
Overall Model				0.01	0.40
*p < 0.10. **p < 0.05. ***p < 0.01.					

Expected Stress and Program Outcome

This analysis tested the relationship between expected stress and program outcome and the hypothesis that soldiers with high expected stress levels would be more likely to medically or voluntarily withdraw from the SFAS program, whereas soldiers with low expected stress levels would be more likely to graduate. (Of the 380 subjects, program outcome information and expected stress questionnaire data were available for only 308 soldiers). A multinomial logistic regression was used to examine this relationship because program outcome is a categorical variable with four possible outcomes (graduation, medical withdrawal, voluntary withdrawal, and other). Physical fitness and social desirability were entered into the regression before expected stress so that their effects could be controlled. No significant relationship was found between expected stress and program outcome as evidenced by a nonsignificant multinomial logistic regression model (see Table 6). Thus, the hypothesis was not supported when controlling for physical fitness and social desirability.

Table 6

Summary of Multinomial Regression Analysis Testing the Relationship Between Expected Stress and Program Outcome (N = 308)				
Program Outcomes	B	SE	Wald	X ²
Graduation (R)	----	----	----	
Social Desirability	----	----	----	
Physical Fitness	----	----	----	
Expected Stress	----	----	----	
Medical Withdrawal				
Social Desirability	1.40	3.30	0.19	
Physical Fitness	0.05	0.01	0.14	
Expected Stress	- 0.03	0.31	0.02	
Voluntary Withdrawal				
Social Desirability	-2.67	2.30	1.30	
Physical Fitness	- 0.01	0.01	3.50	
Expected Stress	0.19	0.19	1.11	
Other				
Social Desirability	1.46	2.20	0.42	
Physical Fitness	-0.01	0.01	1.12	
Expected Stress	0.32	0.20	2.30	
Overall Model				11.0
<p><u>Footnote.</u> Graduation was used as the reference group (R) against which all other groups were compared. Social Desirability and Physical Fitness are controlled for each outcome possibility.</p> <p>The Wald test is used to test the statistical significance of each coefficient (β) in the model. The Wald is a positive number because it is squared in units $[B/S.E.]^2$. The direction of the variables' relationships in this model is found by reviewing the direction of the B value.</p> <p>*p < 0.10. **p < 0.05. ***p < 0.01.</p>				

Psychosocial Resources and Expected Stress

This analysis examined whether psychosocial resources would be directly related to soldiers' expected stress response to the SFAS program. It was hypothesized that soldiers with high psychosocial resources (social support, mattering, and self-efficacy) would expect the SFAS program to be less stressful than soldiers with low psychosocial resources. (Of the 380 subjects, psychosocial resource and expected stress data were available for 309 subjects). A linear regression was used to test this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. No significant relationship was found between psychosocial resources and expected stress as evidenced by a nonsignificant regression model (see Table 7). Thus, the hypothesis was not supported when controlling for physical fitness and social desirability.

Table 7

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources and Expected Stress (N = 309)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-0.13	0.66	-0.01		
Physical Fitness	-0.00	0.00	-0.08		
Independent Variable					
Psychosocial Resources	0.12	0.11	0.06		
Overall Model				0.01	0.91
*p < 0.10. **p < 0.05. ***p < 0.01.					

Psychosocial Resources and Cognitive Stress Response

This analysis examined the relationship between soldiers' psychosocial resources and cognitive stress response during the SFAS program. It was hypothesized that soldiers with high psychosocial resources would have a lower cognitive stress response during the SFAS program than soldiers with low psychosocial resources. (Of the 380 subjects, data for 272 subjects were available). A linear regression was used to test this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. While the overall effect for the model was significant— $F(3,268) = 3.21, p < 0.05, R^2 = 0.04$ —the beta value for psychosocial resources was nonsignificant (see Table 8). The overall model results seemed to be due to the significant effect of social desirability ($\beta -0.17, p < 0.01$). Thus, the hypothesis was not supported when controlling for physical fitness and social desirability. The social desirability results suggest that subjects' responses to the cognitive stress items were affected by social desirability.

Table 8

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources and Cognitive Stress (N = 272)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-1.30	0.48	-0.17***		
Physical Fitness	-0.00	0.00	-0.08		
Independent Variable					
Psychosocial Resources	0.02	0.09	0.01		
Overall Model				0.04	3.21 **
*p < 0.10. **p < 0.05. ***p < 0.01.					

Psychosocial Resources and Physical Outcome: Number of Injuries/Illnesses

This analysis was conducted to test the hypothesis that soldiers with high psychosocial resources would have lower numbers of injuries/illnesses when compared to soldiers with low psychosocial resources (Of the 380 subjects, data for 92 subjects were available). A linear regression was used to examine this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. No significant relationship was found for the overall regression model (see Table 9). The hypothesis was not supported when controlling for physical fitness and social desirability.

Table 9

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources and Number of Injuries/Illnesses (N = 92)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-3.50	2.16	-0.18		
Physical Fitness	0.00	0.01	0.01		
Independent Variable					
Psychosocial Resources	0.29	0.34	0.10		
Overall Model				0.03	1.00
*p < 0.10. **p < 0.05. ***p < 0.01.					

Psychosocial Resources and Physical Outcome: Severity of Injuries/Illnesses

This analysis tested the hypothesis that there is a negative relationship between psychosocial resources and soldiers' perceived severity of their injuries/illnesses. (Of the 380 subjects, data for 92 subjects were available). A linear regression was used to examine this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. No significant relationship was found for the overall regression model (see Table 10). The hypothesis was not supported when controlling for physical fitness and social desirability. Although the model was not significant, the psychosocial resource variable was marginally (positively) significant ($p = .06$).

Table 10

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources and Severity of Injuries/Illnesses (N = 92)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-2.23	1.69	-0.14		
Physical Fitness	-0.00	0.00	-0.07		
Independent Variable					
Psychosocial Resources	0.51	0.26	0.21*		
Overall Model				0.05	1.60
*p < 0.10. **p < 0.05. ***p < 0.01.					

Psychosocial Resources and Program Outcome

This analysis examined the relationship between psychosocial resources and the program outcome. It was hypothesized that soldiers with high psychosocial resources would be less likely to voluntarily or medically withdraw from the SFAS program and would be more likely to graduate, when compared to soldiers who had low psychosocial resources. Of the 380 subjects, program outcome information and psychosocial resource questionnaire data were available for only 308 subjects. A multinomial logistic regression was used to test this relationship. Physical fitness and social desirability indices were entered into the regression first so that their effects could be controlled. Results of this analysis showed a significant overall model fit: $X^2(9) = 26.9$, $p < 0.01$ (see Table 11).

In addition, the relationship between psychosocial resources and voluntary withdrawal was significant (Wald = 10.2, $p < 0.01$, $B = -1.2$). This indicated that soldiers who voluntarily withdrew from the SFAS program had lower levels of psychosocial resources than soldiers who graduated. A significant relationship (Wald = 13.6, $p < 0.01$, $B = -1.6$) was also found between psychosocial resources and “other” reasons. It is, however, difficult to interpret this result because of the varied causes that make up this outcome variable. Overall, these findings provided partial support for the hypothesis.

Table 11

Summary of Multinomial Regression Analysis Testing the Relationship Between Psychosocial Resources and Program Outcome (N = 308)				
Program Outcomes	B	SE	Wald	X ²
Graduation (R)	----	----	----	
Social Desirability	----	----	----	
Physical Fitness	----	----	----	
Psychosocial Resources	----	----	----	
Medical Withdrawal				
Social Desirability	1.75	3.37	0.27	
Physical Fitness	0.00	0.01	0.19	
Psychosocial Resources	-0.36	0.63	0.33	
Voluntary Withdrawal				
Social Desirability	-1.58	2.38	0.44	
Physical Fitness	0.01	0.00	2.38	
Psychosocial Resources	-1.21	0.38	10.20***	
Other				
Social Desirability	2.95	2.33	1.60	
Physical Fitness	-0.01	0.00	0.51	
Psychosocial Resources	-1.60	0.42	13.60***	
Overall Model				26.90***
<p>Footnote: Graduation was used as the reference group against which all other groups were compared. Social Desirability and Physical Fitness are controlled for each outcome possibility.</p> <p>The Wald test is used to test the statistical significance of each coefficient (β) in the model. The Wald is a positive number because it is squared in units $[B/S.E.]^2$. The direction of the variables' relationships in this model is found by reviewing the direction of the B value.</p> <p>*p < 0.10. **p < 0.05. ***p < 0.01.</p>				

*Psychosocial Resources, Expected Stress, Cognitive Stress, and Physical Outcome:
Number of Injuries/Illnesses*

This analysis attempted to examine the relationship between psychosocial resources, expected stress, cognitive stress, and number of injuries/illnesses reported. It was hypothesized that a higher number of injuries and illnesses would be negatively correlated with psychosocial resources and positively correlated with expected and cognitive stress. Of the 380 soldiers, only 80 soldiers completed the psychosocial resources, expected stress, cognitive stress, and injury/illness surveys. A linear regression was used to examine this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. No significant relationship was found for the overall regression model (see Table 12). The hypothesis was not supported when controlling for physical fitness and social desirability.

Table 12

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources, Expected Stress, Cognitive Stress, and Number of Injuries/Illnesses (N = 80)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-3.49	2.42	-0.17		
Physical Fitness	-0.01	0.01	-0.07		
Independent Variables					
Expected Stress	-0.02	0.20	-0.01		
Cognitive Stress	0.25	0.27	0.11		
Psychosocial resources	0.23	0.41	0.07		
Overall Model				0.05	0.76
<p><u>Footnote:</u> Due to the small number of subjects, this analysis had limited power. *p < 0.10. **p < 0.05. ***p < 0.01.</p>					

*Psychosocial Resources, Expected Stress, Cognitive Stress, and Physical Outcome:
Severity of Injuries/Illnesses*

This analysis attempted to examine the relationship between psychosocial resources, expected stress, cognitive stress, and the severity of injuries/illnesses. Of the 380 soldiers, only 80 soldiers completed the psychosocial resources, expected stress, cognitive stress, and injury/illness surveys. A linear regression was used to examine this relationship. Physical fitness and social desirability were entered first into the regression so that their effects could be controlled, followed by psychosocial resources. The overall effect for the model was significant: $F(5, 74) = 2.38, p < 0.05, R^2 = 0.14$ (see Table 13). The overall effect seemed to be the result of the significant effect of social desirability ($\beta = -0.22, p < 0.05$), cognitive stress ($\beta = 0.23, p < 0.05$), and the marginally significant effect of psychosocial resources ($\beta = 0.19, p = 0.09$). It should be noted, however, that the marginally significant effect of psychosocial resources is in the opposite direction to the stated hypothesis. Thus, the hypothesis was partially supported due to the positive relationship between cognitive stress and severity of injuries/illnesses when controlling for physical fitness and social desirability.

Table 13

Summary of Regression Analysis Testing the Relationship Between Psychosocial Resources, Expected Stress, Cognitive Stress and Severity of Injuries/Illnesses (N = 80)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-3.27	1.70	-0.22**		
Physical Fitness	-0.07	0.00	-0.13		
Independent Variables					
Expected Stress	-0.10	0.14	- 0.09		
Cognitive Stress	0.38	0.18	0.23**		
Psychosocial Resources	0.48	0.28	0.19*		
Overall Model				0.14	2.38**
Footnote: Due to the small number of subjects, this analysis had limited power. *p < 0.10. **p < 0.05. ***p < 0.01.					

Psychosocial Resources, Expected Stress, Cognitive Stress, Physical Outcome, and Program Outcome

This analysis attempted to examine the relationship between psychosocial resources, expected stress, cognitive stress, physical outcome (injuries and illnesses), and program outcome. It was hypothesized that soldiers with high psychosocial resources and low expected stress and cognitive stress, and lower number and severity of injuries and illnesses would be more likely to graduate from the SFAS program. This hypothesis could not be tested because only 80 soldiers completed all of the necessary questionnaires and because only 3 of the subjects who completed the injury and illness questionnaire graduated from the SFAS program.

Physical Outcome and Program Outcome

This analysis attempted to examine the hypothesis that there is a negative relationship between injuries/illnesses and the SFAS program outcome. (Out of the 380 subjects, data were available for 92 subjects). Only 3 of those 92 subjects who completed the injury and illnesses questionnaire graduated from the SFAS program. Thus, the hypothesis could not be tested.

Supplementary Analyses

The psychosocial resources variable is composed of three psychosocial variables (social support, mattering, and self-efficacy). Supplementary analyses were performed to determine whether all of the resources contributed equally to the relationship between psychosocial resources and physical outcome (specifically the severity of injuries/illnesses) and program outcome, or if one of the resources was driving the relationship. The number of injuries/illnesses was not included in these analyses because the relationship between psychosocial resources (combined) and number of injuries/illnesses was found earlier to be nonsignificant.

Social Support, Mattering, Self-Efficacy, and Program Outcome: Severity of Injuries/Illnesses

A linear regression was conducted to determine whether any of the three psychosocial resources were significantly driving the relationship between the psychosocial resource variable and severity of injuries/illnesses. Physical fitness and social desirability were entered into the analysis first as control variables, followed by social support, mattering, and self-efficacy. Of the 380 subjects, data were available for

92 soldiers. The overall model was significant: $F(5, 86) = 2.83, p < 0.05, R^2 = 0.14$ (see Table 14). The overall effect seemed to be the result of the marginally significant effects of social desirability ($\beta = -0.18, p = 0.09$), and mattering ($\beta = -0.27, p = 0.07$), and the significant effect of social support ($\beta = 0.45, p < 0.01$). Thus, the hypothesis was partially supported due to the negative relationship between mattering and severity of injuries/illnesses when controlling for physical fitness and social desirability. However, it should be noted that the relationship between social support and severity of injuries/illnesses, while significant, was in the opposite direction to the stated hypothesis.

Table 14

Summary of Regression Analysis Testing the Relationship Between Social Support, Mattering, Self-Efficacy, and Severity of Injuries/Illnesses (N = 92)					
Predictor Variable	B	SE B	β	Total R ²	F
Control Variables					
Social Desirability	-2.84	1.64	-0.18*		
Physical Fitness	-0.00	0.01	-0.00		
Independent Variable					
Social Support	0.84	0.25	0.45***		
Mattering	-0.51	0.28	-0.27*		
Self-Efficacy	0.16	0.29	0.07		
Overall Model				0.14	2.83**
*p < 0.10. **p < 0.05. ***p < 0.01.					

Social Support, Mattering, Self-Efficacy, and Program Outcome

A multinomial logistic regression was conducted to determine whether any of the three psychosocial resources were significantly driving the relationship between the psychosocial resource variable and program outcome. Physical fitness and social desirability were entered into the analysis first as control variables, followed by social support, mattering, and self-efficacy. (Of the 380 subjects, data were available for 308 soldiers). The overall model was significant: $X^2(15) = 35.7, p < 0.01$ (see Table 15). Further examination of the analysis indicated that the soldiers who voluntarily withdrew from the program were lower in self-efficacy than the soldiers who graduated (Wald = 12.8, $p < 0.01$, $B = -1.5$). Similarly, those soldiers who dropped out for “other” reasons (Wald = 5.4, $p < 0.05$, $B = -1.1$) were lower in self-efficacy.

Table 15

Summary of Multinomial Regression Analysis Testing the Relationship Between Social Support, Mattering, Self-Efficacy, and Program Outcome (N = 308)				
Program Outcomes	B	SE	Wald	X ²
Graduation (R)	----	----	----	
Social Desirability	----	----	----	
Physical Fitness	----	----	----	
Social Support	----	----	----	
Mattering	----	----	----	
Self-Efficacy	----	----	----	
Medical Withdrawal				
Social Desirability	1.71	3.36	0.25	
Physical Fitness	0.01	0.01	0.26	
Social Support	-0.05	0.53	0.01	
Mattering	0.35	0.54	0.42	
Self-Efficacy	-0.97	0.69	1.96	
Voluntary Withdrawal				
Social Desirability	-1.64	2.41	0.46	
Physical Fitness	-0.01	0.01	1.88	
Social Support	-0.17	0.32	0.26	
Mattering	0.17	0.35	0.23	
Self-Efficacy	-1.50	0.42	12.82***	
Other				
Social Desirability	2.99	2.33	1.64	
Physical Fitness	-0.00	0.00	0.43	
Social Support	-0.52	0.35	2.22	
Mattering	-0.16	0.37	0.19	
Self-Efficacy	-1.10	0.45	5.43**	
Overall Model				35.7***
<p>Footnote: Graduation was used as the reference group against which all other groups were compared. Social desirability and physical fitness are controlled for each outcome possibility.</p> <p>The Wald test is used to test the statistical significance of each coefficient (β) in the model. The Wald is a positive number because it is squared in units $[B/S.E.]^2$. The direction of the variables' relationships in this model is found by reviewing the direction of the B value.</p> <p>*p < 0.10. **p < 0.05. ***p < 0.01.</p>				

Chapter 5

Discussion

Overview

The aim of this study was to examine the relationship between psychosocial resources (social support, mattering, and self-efficacy), expected and cognitive stress, soldiers' propensity for injuries and illnesses, and ultimately their completion of a physically challenging task—the SFAS program. It was hypothesized that high levels of psychosocial resources would buffer the stress soldiers anticipated before and experienced during the SFAS program, be associated with less self-reported injury and illness, and be predictive of the soldiers' likelihood to graduate from the SFAS program. The main findings are summarized in figure 2. The results indicated that expected stress significantly predicted the level of cognitive stress the soldiers experienced during training, but the hypothesis that psychosocial resources would predict cognitive stress was not supported. The hypothesis that expected stress was significantly related to program outcome was not confirmed; however, the hypothesis that the psychosocial resource variable was related to program outcome was confirmed. The hypothesis regarding the relationship between expected stress and physical outcome was not supported. The results for the relationship between psychosocial resources and physical outcome were opposite to the stated hypothesis. The hypothesis regarding the relationship between psychosocial resources, expected stress, cognitive stress, and physical outcome was partially supported. The supplemental regression analyses examining the latent construct psychosocial resources (social support, mattering, and self-efficacy) indicated that social support was driving the relationship between psychosocial resources and

physical outcome and that self-efficacy was driving the significant relationship between psychosocial resources and program outcome.

Final Stress-Injury Model

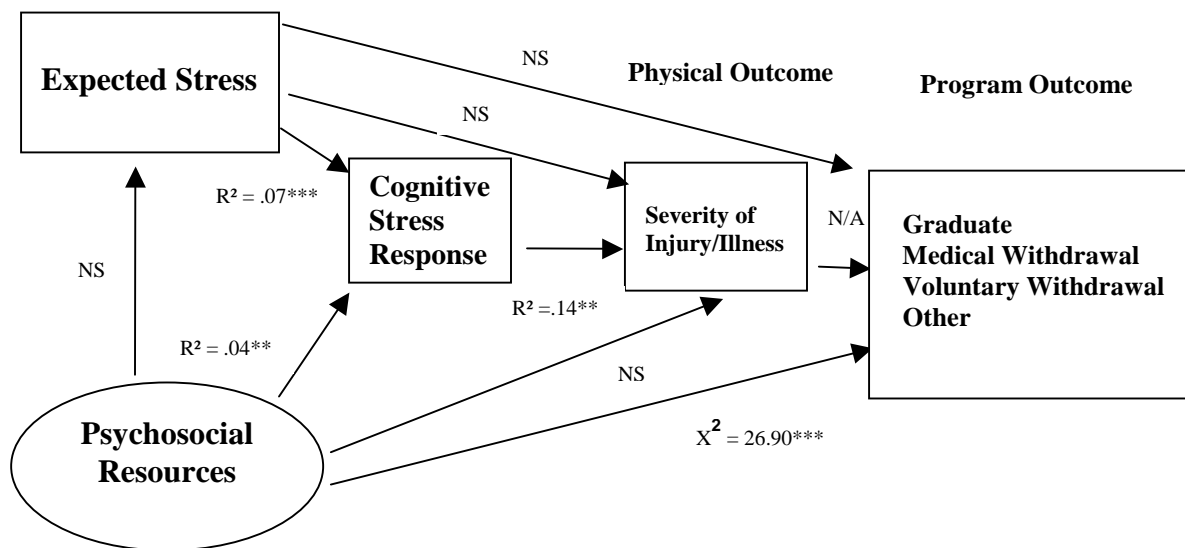


Figure 2

Expected Stress and Cognitive Stress Response

Results of this study showed a significant (positive) relationship between expected stress and cognitive stress. During the SFAS program, soldiers were pushed to their limits daily and were required to endure a great deal of physical and psychological stress. If soldiers entering the SFAS program perceived the program to be stressful before they actually began the program, they were highly susceptible to excessive mental stress and physical stress during the program itself. There is limited research on expected stress and its effects on the cognitive stress response during a difficult task. According to Heslegrave and Colvin (1996), lower reactivity to stressful stimuli before and during task performance increases resistance to stress effects when the intensity of the stressor increases.

The present data are consistent with previous findings, suggesting that higher reactivity to potential stressful stimuli before task performance lowers resistance to stress effects and should therefore lead to negative consequences. Liao and Masters (2002) noted that as anxiety increases, it is likely that physiological information becomes more salient to the individual, thereby creating greater self-awareness. A soldier's acute awareness of his heightened mental stress level may cause him to become more stressed, which further increases tension both mentally (cognitive anxiety) and physically (somatic anxiety). All of this suggests that the negative effects of cognitive stress responses can be significantly reduced if expectations of stress are lowered or eliminated prior to an event. In this regard, simple measures can be taken (e.g., obtaining accurate information about the upcoming event and better task preparation) to help decrease anticipated stress, and

thereby help reduce the physical and psychological stress each soldier will experience during the training event.

Further exploration is necessary before attempting to modify the stress experienced by the soldiers in the SFAS program, and other similar programs. Because no relationship was found between expected stress, and only a marginal relationship between cognitive stress and severity of injuries/illnesses, the stress experienced by the soldiers does not appear to be detrimental (physically or mentally). It is theoretically possible that the stress experienced by the soldiers may have actually been useful, providing greater self-awareness mentioned by Liao and Masters (2002). This awareness, instead of having a negative effect on the soldiers, may have helped the soldiers to perform better.

Expected Stress and Physical Outcome

It was hypothesized that expected stress would be significantly related to injuries and illnesses (physical outcome). The results, however, did not support this hypothesis. Perhaps the simplest explanation for the nonsignificant finding is that expected stress does not have the power to directly affect the soldiers' injuries and illnesses. It appears that expected stress has only an indirect effect on physical outcome through cognitive stress response (actual stress experienced during the event). It is also possible that, because the SFAS soldiers have prior military experience, they were sufficiently prepared for this type of training psychologically. The soldiers may have expected the program to be stressful, but their prior military experience may have tempered this expectation because they knew that they possessed the experience and preparation necessary to handle the upcoming stress. The fit soldiers may have felt more prepared for the SFAS

program, thereby controlling the amount of stress they would expect to experience and keeping arousal appropriate to the program task (Heslegrave & Colvin, 1996).

Also, due to their military training and added preparation for the SFAS program, the soldiers may have been in better physical condition, which would minimize injuries. Previous research conducted by the ARI (Brooks, 1997) indicated that physical fitness is significantly related to the completion of the SFAS program. Because the Special Forces researchers have found a strong relationship with fitness and injuries, the military sets high standards for fitness and allows only the fittest soldiers to enter the SFAS program. It then appears that even if the soldiers anticipated the SFAS program to be stressful, high levels of physical fitness provided protection against anticipated stress. As such, physical fitness may have moderated the effects of expected stress on physical outcomes. A recent study of Army trainees found that physical fitness was inversely related to injuries incurred during training (Henderson, 2000).

Expected Stress and Program Outcome

Expected stress was also hypothesized to predict whether the soldiers would be more likely to complete the SFAS program or withdraw due to voluntary or medical reasons. Results revealed that expected stress did not significantly affect program outcome. The soldiers who voluntarily withdrew and the soldiers who were medically withdrawn from the SFAS program did not report significantly higher levels of expected stress than the soldiers who graduated.

One explanation for these results is that the soldiers attempted to suppress their feelings of stress or were adequately prepared for the stress due to their previous military training and therefore did not experience high enough levels of expected stress to directly

relate to their task completion. SF soldiers are often considered more “stress hardy” than other soldiers (Morgan et al., 2000). The soldiers are carefully selected for the SFAS program and go through several physical and cognitive tests before they enter the program. Although they do not know everything involved in the program, they are well aware of what will be expected of them, and each soldier voluntarily chooses to enter the program.

Brooks (1997) found that the soldiers who reported they could meet training goals outlined in an SFAS handbook were twice as successful as those who reported being unprepared. Morgan et al. (2002) notes that even when a person feels stress, he may have a higher tolerance to the stressful situation as long as he feels he is accomplishing a worthwhile task. So, although the soldiers may have had some anticipated stress about the program, they were prepared for the challenge and did not allow their stress to control their ability to complete the program. This idea is partially supported by the results of the supplemental findings, which indicated that the soldiers who were higher in self-efficacy were more likely to complete the program than the soldiers who were lower in self-efficacy. The literature is weak on the effects of expected stress, and further research in this area could help us better understand the relationship between the anticipated stress response and task completion. It is possible that expected stress does manifest itself, but this response was not captured by the measures utilized in the current study. It is also possible that expected stress has a more significant effect on soldiers who are not as highly trained as SF soldiers.

Psychosocial Resources and Cognitive Stress

It was hypothesized that a significant relationship would be found between the soldiers' psychosocial resources and cognitive stress response during the SFAS program. However, the findings did not confirm this hypothesis. The cognitive stress response questionnaires were given five days after the soldiers started the SFAS training program in an attempt to capture data from as many soldiers as possible before they began to drop out. According to ARI researchers, however, the highest drop-out rate appears to occur within the first few days of the SFAS training. In the May 2002 SFAS training class, there was a 20% dropout rate within the first five days of the program. Thus, it is possible that many of the weak soldiers had already dropped out of the program before the questionnaire was administered, meaning that the remaining soldiers were psychologically stronger (possessed more psychosocial resources). This would cause the sample to be more homogeneous and thus reduce the correlation between the two variables. The reduced variance in psychosocial resources and cognitive stress among the remaining soldiers would naturally lower the correlation.

The above finding is inconsistent with the literature. Previous studies have found each of the psychosocial resources (social support, mattering, and self-efficacy) to have an individual effect in reducing cognitive stress (Chan, 2002; Harlow & Cantor, 1995; Williams & Andersen, 1998; Yali & Lobel, 2002) and in protecting individuals from negative psychological states (Rohall & Segal, 2001; Rosenberg & McCullough, 1981). Theoretically, it is possible that the soldiers either attempted to suppress their feelings of stress or were adequately prepared for the stress due to their previous military training and therefore did not experience high levels of cognitive stress. It is also possible that the

soldiers training for the SF differ from the general population studied in much of the literature and perhaps are “hardier” (Kobasa 1979a) than the typical sample in previous studies. This suggests a possible “ceiling effect” for psychosocial resources among these soldiers. This explanation is consistent with Heslegrave and Colvin’s 1996 psychophysiological model, according to which some individuals (people with a higher internal locus of control and thrill-seeking characteristics) engage in a task-oriented coping process that actively suppresses exogenous stimuli and arousal associated with these stimuli.

Psychosocial Resources and Physical Outcome

This analysis examined the relationship between psychosocial resources and the number and severity of injuries and illnesses soldiers experienced during the SFAS program. Previous literature has indicated that psychosocial resources are likely to buffer injuries and illnesses (Anthony & O’Brien, 2002; Beuter & Duda, 1985; House, Landis, & Umberson, 1988; Williams & Andersen, 1998), although the exact nature of the relationship is still unclear. The results of the overall model were not significant, but marginal significance was found within the model between psychosocial resources and severity of injuries and illnesses reported by the soldiers. This relationship was positive—opposite of what was hypothesized. There are several possible explanations for these findings. One possible explanation is a methodological one, according to which the number of soldiers who filled out both the psychosocial resources and injury/illness surveys was much lower than anticipated. This may have biased the sample and the responses because the physical outcome data were available for relatively few soldiers.

Specifically, the sample may have become a homogeneous group which would then have further reduced the variance and the correlation between the variables.

It was anticipated that the injury/illness questionnaire would be given out when each soldier exited the program, whether it be for medical reasons, voluntarily or because they graduated. Only a small portion of the soldiers actually filled out the questionnaire, most of whom voluntarily withdrew from the program ($n = 47$); thus, 51% of the soldiers were included in the current analysis. With such a small number of the overall SFAS population included in these results, the soldiers who filled out the questionnaire needed for this analysis may have been a homogeneous group and may have had a different perception of social support than the rest of the SFAS population. Since over half of the soldiers who completed the injury/illness questionnaire were soldiers who voluntarily withdrew from the program, it is possible that within this subgroup of the overall SFAS population social support was perceived as a stressor instead of a resource. The soldiers who chose to leave the program may have felt they were letting down those who supported them, and this may have increased their stress and ultimately the injuries/illnesses they reported.

It is also possible that the relationship between psychosocial resources and severity of injuries/illnesses is spurious. In the original Andersen and William's model (1988) used to create the model for this study, there were several other psychosocial variables addressed. Only some of those variables are the same in the model created for this study. It was hypothesized that psychosocial resources (social support, mattering, and self-efficacy) would have a direct, negative relationship with injuries/illnesses, but it is

possible that there were other variables not captured in this study that would have altered these results.

Another explanation is that the subjective nature of the severity of injuries/illnesses questions may have caused misleading results. Each soldier completed the injury/illness questionnaire when he exited the program. The soldiers had just endured several weeks of grueling training, hunger, excessive physical activity, and sleep deprivation. It is possible that they were expressing all of those feelings when they completed the severity questions. Instead of capturing the severity of their specific injuries (identified in the injury/illness questions), their responses may have been the result of feeling complete exhaustion and overall aches (aches/pains that are expected to occur during the 24-day SF training). Because the Special Forces are such an elite unit, it is a big accomplishment to pass the SFAS program and ultimately become a member. Since most of the soldiers who completed the injury/illness questionnaire were soldiers who voluntarily withdrew from the program or were released due to a variety of other reasons, these soldiers may have used the severity questions in this questionnaire as a way to justify their quitting or being removed from the program. Instead of admitting that they were unable to complete the program, these soldiers may have rationalized their lack of program completion as being caused by their severe pain. The fact that the regression coefficient between psychosocial resources and severity of injury/illness was positively significant seems to support this reasoning. Normally, if the soldiers were severely injured or sick the SF medical doctor would have forced them to medically withdraw from the program.

In his review of the literature concerning psychological variables related to injury, Bergandi (1985) discusses the idea that injuries are a sign of masculinity and/or escape.

He notes that it is possible that an athlete with low self-confidence may use injuries as an excuse to avoid failure. This rationale is supported by the relationship found in this study between psychosocial resources, specifically self-efficacy, and program outcome. Self-efficacy increased the likelihood of graduation from the SFAS program. It is also important to note that, due to the subjective nature of the severity of injuries/illnesses questions, a different measure of injury/illness might yield different results. A possible problem with using this questionnaire as a measure of injury and illness is that, by the nature of the program, the longer a soldier stays in the program, the more aches and pains he is likely to experience and report.

Finally, the population examined in this study is different from many of the populations used in previous studies. Two significant differences may exist: the tasks that were required of the soldiers attempting the SFAS program and the personalities of soldiers attempting to become SF soldiers. It is possible that psychosocial resources, particularly social support, may have a threshold regarding its ability to protect one from injuries/illnesses. The SFAS training is designed to be a very mentally and physically grueling challenge that continues for several weeks. It is possible that these individuals do have high psychosocial resources (as can be seen from the relationship between psychosocial resources and program outcome), but no resource can fully protect soldiers from injuries/illnesses under the extreme circumstances of the 24-day SF training. It is possible that social support does buffer the effects of stress and protects individuals from injuries and illnesses, but may only work up to a point. After weeks of extreme stress it is possible that psychosocial variables do not provide enough protection against the stress to avoid injuries/illnesses, but may offer support in other ways—such as offering the

support to continue even when one is injured. It is possible that in a training program requiring this much exertion, social support can only buffer the stress process to a certain point. Research conducted by the U.S. Army Infantry program at Fort Benning, N.C. has found that there may be a “point of diminishing returns” where fitness training (specifically running) no longer improves performance, but actually serves to increase the risk of injuries.

The results of this study appear to indicate that an increase in psychosocial resources increases the perception of severity of injuries and illnesses, but the combination of a homogeneous population, and the extreme nature of the training may have created misleading results. To better understand the relationship between psychosocial resources and injuries/illnesses, it may be useful to examine the relationship in a variety of other military settings, especially settings where the soldiers do not have the same level of physical fitness, training, and personality characteristics as the soldiers selected for the SFAS program (e.g., new soldiers, other specialties, and female soldiers). It may also be beneficial to consider using a more general health state measure instead of the injury/illness questionnaire utilized in this study. Although some significant results were found between severity of injury/illness and psychosocial resources, there was no relationship with psychosocial resources or any of the other independent variables and the number of injuries/illnesses. Furthermore, the means for the two injury/illness measures (number and severity) were both very low. It is possible that a different measure of physical health may prove to better capture the relationship between the independent variables and the soldiers’ physical health and help better determine if a relationship exists.

Psychosocial Resources and Program Outcome

As predicted, a highly significant relationship between psychosocial resources and program outcome was found. The soldiers who graduated from the SFAS program had more psychosocial resources than the soldiers who voluntarily withdrew. Although psychosocial resources had an effect on whether the soldiers were more likely to voluntarily withdraw from the SFAS program, they did not affect whether soldiers medically withdrew from the program. Psychosocial resources did not have an effect on the soldiers' cognitive stress or on their injuries and illnesses, but did affect the most important outcome variable—whether the soldiers graduated or withdrew from the program. It appears that psychosocial resources were not powerful enough to protect the soldiers from injuries and illnesses, but proved to be a significant resource for goal attainment. Possibly, psychosocial resources gave the soldiers a feeling of significance (Rosenberg et al., 1999) and created a belief in their ability to complete a specific task (Bandura, 1991), stay motivated (Bianco, 2001), and have better goal-setting abilities (Evans & Hardy, 2002), and through these resources, reduced their fear of failing the program. However, those soldiers who were lower in psychosocial resources may have not been psychologically prepared for the demands of the SFAS program and ultimately chose to drop out.

Psychosocial Resources, Expected Stress, Cognitive Stress, and Physical Outcome

It was hypothesized that a significant relationship would be found between soldiers' psychosocial resources, expected stress, cognitive stress, and the number and severity of injuries and illnesses the soldiers experienced during the SFAS program. The research findings partially supported this hypothesis. Within this analysis, cognitive stress and

psychosocial resources were correlated with perceived severity of injuries/illnesses. As expected, cognitive stress was positively correlated with the soldiers' perception about the severity of the injuries/illnesses they experienced. The cognitive stress portion of the model in this study was similar to the Andersen and William's (1988) model. It was expected that if a threat was perceived (e.g., extreme physical challenge), cognitive stress would manifest into a psycho-physiological response (tightening of the muscles, narrowed visual acuity, an increased release of cortisol, decreased immunological functioning, and a belief that one cannot accomplish the task) (Andersen & Williams, 1988). In turn, this negative response to stress would increase the likelihood of injury, illness, or dropout rates of a specific activity. From these findings it appears this relationship was supported. To further support this relationship, not only did the soldiers who reported higher cognitive stress report higher severity of injuries/illnesses, but most of the soldiers whom the injury/illness results were based on dropped out or were forced to leave the SFAS program. It is important to note that although this appears to support the hypothesis the sample in this analysis was a subgroup of the overall population (out of all the soldiers that filled out the questionnaire only three of them were graduates of the program) and due to the homogeneity of this group may have caused misleading results.

The relationship between psychosocial resources and severity of injuries/illnesses was (positively) marginally significant. This result contradicts the current literature. As mentioned earlier (in the discussion pertaining to psychosocial resources and severity of injuries/illnesses), there may be several explanations for the results found in this study. The results of this study may be misleading due to a combination of a homogeneous

population, small variance, low power, and the extreme nature of the training. If all of the SFAS soldiers had completed all of the surveys required for this analysis, it is possible the results may have been different.

Supplemental Analyses

Supplemental regression analyses were conducted to further examine the relationships between psychosocial resources, physical outcome, and program outcome. It was expected that the variables that made up the construct psychosocial resources (social support, mattering, and self-efficacy) would each contribute significantly to the program outcome results. In order to determine whether this was the case, the resources were tested separately within the same analyses. These analyses revealed that one resource in particular had a significant relationship with physical outcome and another with SFAS program completion.

Social Support, Mattering, Self-Efficacy, and Severity of Injuries/Illnesses

The purpose of this analysis was to determine whether the three psychosocial resources in this research study contributed equally to the psychosocial resource variable or whether one of the variables was driving the relationship between psychosocial resources and severity of injuries/illnesses. The results of this analysis indicated that social support and mattering were the psychosocial variables significantly or marginally significantly related to the severity of injuries/illnesses. That is, social support was significantly positively related to the severity of injuries/illnesses while mattering was marginally negatively related to severity of injuries/illnesses. The ability of social support to buffer the stress process has been established in the literature as having the

ability to enable a person under stress to change the situation, to change the meaning of the situation, or to change his or her emotional reactions to the situation (Thoits, 1986). There is also research that links stress to the injury and illness process (Bergandi, 1985), but there is no direct link between social support's ability to buffer injuries/illnesses during a physically grueling challenge. Mattering, on the other hand, is a newer concept that has been found to provide protection against negative mental states (Rohall & Segal, 2001; Rosenberg & McCullough, 1981; Taylor & Turner, 2001), but little is known about its ability to buffer injuries/illnesses.

Thus, it appears that mattering may have provided a buffer against perceived severity of injuries/illnesses, while social support does not, and is actually positively correlated with perceived severity of injuries/illnesses. As mentioned earlier (in the discussion pertaining to psychosocial resources and severity of injuries/illnesses), there may be several explanations for the results found in this study. The results of this study may be misleading due to the combination of a homogeneous population, low power, and the extreme nature of the training. From this research it appears that the different psychosocial resources interact with severity of injuries and illnesses differently, but further research is needed to more clearly show which resources affect the injury and illness process. Although some inferences can be made due to the findings between mattering and severity of injury/illness, it should be noted that this relationship was marginal, and limited conclusions should be drawn until further studies are conducted.

Social Support, Mattering, Self-Efficacy, and Program Outcome

The results indicated that self-efficacy was the only psychosocial variable that had a significant relationship with the SFAS program outcome. It appears that the soldiers

who believed that they could successfully execute the required tasks (e.g., complete the SFAS program) were more likely to graduate. According to Bandura (1991), an individual may take on and perform assuredly tasks he judges himself capable of successfully completing. The present findings support Bandura's theory and suggest that self-efficacy may be the most important psychosocial resource because it deals with people's perceived ability to undertake and successfully complete difficult challenges. Certainly, the SFAS program is mentally and physically demanding, and thus, it is not surprising that self-efficacy correlates positively with graduation from the SFAS program. The program completion requires mental tenacity because of the continuous exposure to stressors (both mental and physical). Soldiers must believe that they have what it takes to complete the program; otherwise, they might quit. Consistent with this reasoning, Chan (2002) found that self-efficacy offers no assistance in the stress process but may offer support for task completion. Self-efficacy is the basis for a soldier's belief in his ability to complete the SFAS program. It appears that the support that self-efficacy (and possibly mattering) provides may not act as a buffer in the stress-injury model, but instead provides motivation and strength to overcome negative consequences during training and gives the soldier the psychosocial resource to complete the training.

Social support is a psychological resource found in the previous literature to provide support to protect against stress (House, Landis, & Umberson, 1988; Williams & Andersen, 1998), and mattering provides protection against negative mental states (Rohall & Segal, 2001; Rosenberg & McCullough, 1981; Taylor & Turner, 2001), but little is known about the direct effects these resources have on task completion. These resources can alter the cognitive appraisal of a situation (Brewer, 2001), which may have

an indirect effect but, from the results of this study, do not have the power to directly impact completion of a task such as the SFAS program. The question still remaining is why didn't social support and mattering have an effect on program outcome?

While self-efficacy played a significant role in completion of the SFAS program, mattering and social support did not appear to provide direct psychological assistance in program completion. There are several possible explanations for the results found in this study. Over the years, the Army has been developing what appears to be a culture of individualism. The Army slogans such as 'be all you can be' and 'an Army of one' seem to promote individual participation and not much social cohesiveness. The soldiers entering the SFAS program may not have been exposed to a great deal of social support or felt a sense of mattering from their previous military units, and therefore, may not have been able to access these resources when needed. It is possible that if increasing teamwork and building support among the soldiers is emphasized earlier in their careers, the social support and sense of mattering perceived by the soldiers would increase. When soldiers enter specialized training programs, deployment, or other challenging situations they would then have the psychosocial resources needed to succeed. Also, the soldiers' feelings of having others to rely on and others relying on them, may help reduce attrition and build a stronger military force.

It is highly likely, due to the uniqueness of the population in this study, that this research would produce different results if conducted using a less prepared (mentally and physically) population; therefore, the psychosocial variables should not be dismissed until further studies are conducted. Although not all of these variables had a significant effect on injuries and illnesses for the SFAS soldiers, there may be a relationship between

the psychosocial resources and injuries/illnesses for soldiers who are less fit and have less military training (e.g., during boot camp). It is also possible that alternate measurements of the psychosocial resources (specifically those of social support and mattering) may yield different results. The measurements used in the current study, in general, were trait type measurements because these psychosocial resources are generally developed over time. It is possible that if different measurements, especially situation specific ones, are used, the results may add to what we already know about these psychosocial resources and their role in buffering stress. If these resources are situation-specific and measured as such, then soldiers could be given questionnaires during the SFAS program (as opposed to before the program) that might reveal different findings, and the nature of these resources could be better understood. Specifically for mattering, the need for this resource may be situational in nature (e.g., SFAS soldiers may not have accessed this resource, but the soldiers who are deployed may feel a much more significant level of mattering).

It is also suggested that other psychological and social resources be considered that can provide added support to the existing resources. Hardiness (Kobasa, 1979a) may be more synergistic with the current psychosocial variables, especially self-efficacy, and the combination of these variables may prove to provide added protection against stressors and aid in completion of challenging tasks. In an effort to better understand the unique population of soldiers like those in the SF, a revision of the latent construct psychosocial resources, specifically tailored to the elite military soldier population, would be useful in identifying the resources utilized by soldiers training for elite tasks, and once the exact

variables are determined, the military would be able to implement effective pretraining preparation techniques.

Conclusions

1. There is a direct positive relationship between expected stress and the actual cognitive stress experienced. Expected stress however, was not directly related to soldiers' injuries/illnesses or to whether soldiers graduated from the program.
2. Psychosocial resources do not appear to have a relationship with how much soldiers expect to experience stress in the program and how much cognitive stress they actually experience.
3. The relationship between psychosocial resources and the severity of injuries/illnesses reported is ambiguous as social support was positively related and mattering tended to be negatively related to the severity of injuries/illnesses.
4. Psychosocial resources have a direct positive relationship with the soldiers' likelihood of graduating from the program. The relationship between self-efficacy and successful program completion appears to be stronger than the relationships of the other psychosocial resources in this regard.
5. Cognitive stress has a positive relationship with the perceived severity of injuries/illnesses experienced by the soldiers during the program.

Limitations

There are a few limitations that should be recognized when reviewing the results of this study. First, because this study used a conveniently selected sample of subjects, the results cannot be generalized to all populations. The soldiers in the SFAS program are a unique population of soldiers and many of them have years of prior military experience and physical preparedness that sets them apart from the general population. Second, because of their unique physical state, the measures may not have been the best indicators for understanding the needs of the SFAS soldiers.

Third, it is possible that the soldiers' responses to the questionnaires may not have been completely accurate. Soldiers spend the first half day completing assessments (a few of which pertain to this study), which can take up to 4 hours. That afternoon they spend 3 or 4 hours taking an achievement test battery called the Test of Adult Basic Education (TABE). It is possible, due to the number of assessments they are asked to do, that their responses may have been inaccurate due to fatigue and a desire to complete all of the questionnaires required. Due to the fact that the soldiers completed several hours of questionnaires during the program, the number of questions this researcher could include was limited. Another factor that may have affected the findings is the possibility that life stressors outside the SFAS program could have influenced the soldiers' responses to the expected stress and cognitive stress items or their decision to voluntarily withdraw. It was assumed that the expected stress and cognitive stress the soldiers felt were due to the current training situation. Also, this study could not control for the soldiers' faking or exaggerating injuries/illnesses in order to be medically withdrawn from the SFAS program. It is possible that the soldiers would rather have been medically withdrawn

from the program than admit they were unable to continue, which would have forced them to voluntarily withdraw. There is also a possibility that soldiers with injuries prior to the SFAS training may have reinjured themselves during the training program.

Last, the data utilized for this study were secondary data; therefore, the collection procedures could not be supervised or modified by the author. Thus, one limitation was the difficulty in ensuring that all of the soldiers completed every questionnaire before leaving the SFAS program. As a result, a large number of the soldiers did not complete the physical outcome questionnaire (injury/illness).

Suggestions for Future Research

This study examined whether psychosocial resources and two types of stress (expected and cognitive) are associated with soldiers' propensity for injuries and illnesses and ultimately their completion of a physically and mentally challenging military training program. The findings of this study offer insight into the role of psychosocial resources utilized by a unique subset of the military, but several questions remain. Specifically, what other psychological and/or social resources could assist a soldier in continuing a mission while experiencing extreme stress and physical injury? Does the psychosocial resource variable have the same relationship in populations that are not as physically fit and mentally prepared as the SFAS soldiers? Would mattering and social support be utilized more as resources to prevent injuries and illnesses and aid in completion of a task under different circumstances (e.g., during boot camp or during participation in a wartime event)?

The information gained from this study could be used to further develop a resource-stress model. This model would represent a modification of the existing stress-injury model, focusing more on the resources accessed and when the most effective time in the stress process would be to utilize each psychosocial resource for optimal performance results. Because this research found that program outcome required the assistance of a specific psychosocial resource (self-efficacy), it may be fruitful to develop a model that clearly identifies whether specific resources are accessed for different outcome variables and what their role is (moderator, mediator, or directly related to the variable being examined).

The analyses that included physical outcome as an independent variable (injuries/illnesses) and soldiers' program outcome as the dependent variable could not be conducted. Future analyses of the relationship between physical outcome (specifically number and severity of injuries/illnesses) and program outcome could determine whether a direct relationship exists between injuries/illnesses and soldiers' completion of the SFAS program. If no direct relationship can be found, it would be fruitful to do further analyses to determine whether some variable moderated this relationship. It is possible that a psychosocial resource such as self-efficacy is strong enough to moderate, helping soldiers successfully complete the program even when they are injured or sick.

It may also be useful to take the research findings from this study one step further and offer soldiers interested in joining the Special Forces self-efficacy building tasks. The soldiers could be given short and long term goals, tasks that parallel some of the mental and physical training that is required to successfully complete the SFAS. If the soldiers are able to prepare for the SFAS in advance and build their self-efficacy about the tasks, it may help them to graduate from the program. In order to determine whether implementing self-efficacy tasks before the SFAS program would be useful, an experimental study could be designed. Randomly selected soldiers attempting to enter the SFAS program would be required to do the self-efficacy building exercises, while others would not. Their self-efficacy would be measured using a short questionnaire before beginning the SFAS program. Their self-efficacy would then be compared to their program results. If the outcome is as predicted, the soldiers who did the self-efficacy building exercises would have a higher likelihood of graduating compared to the soldiers who did not do the self-efficacy building exercises prior to the SFAS program. If it is

determined that soldiers with high levels of self-efficacy entering the SFAS training had a greater likelihood of successful program completion, then it might be beneficial for the Army to implement a pre-training program prior to SFAS to ensure high graduation rates. This would also help to reduce time, cost, and manpower related to the SFAS training program.

Implications for Organized Sports

The literature on athletics and sport activities reflects well-researched questions and issues. This sport-relevant research is pertinent to the current study with its focus on physically challenging activities. It follows that well-documented findings from athletic and physical fitness activity studies have direct relevance to the current study (Andersen & Williams, 1988; Liao & Masters, 2002; Smith, Small, & Ptacek, 1990; Wagner, Williams, & Long, 1990; Wiedenfeld et al., 1990). In recent years military research has begun to recognize the parallels between military training and sporting activities, and between soldiers and athletes. During a military symposium in April 2002, several military psychologists referred to soldiers as athletes and military training events as athletic events (Cuda, 2002; Brown, 2002; Schneider, 2002). As researchers continue to understand the mindset of both the military soldier and the elite athlete, they will continue to see the similarities between soldiers and athletes. It is also becoming more common that military personnel, due to their physical training and personality characteristics, are becoming more involved in physically challenging sports such as ultra marathons and eco-challenge competitions.

Following this reasoning, research results from military training activities could offer insight and important information for the world of athletics and physical fitness (e.g., psychosocial resources needed to complete physically challenging activity, and levels of fitness that help determine task completion). A clear understanding of the parallels between the personality, persistence, and motivation of military soldiers and athletes needs to be developed—specifically the similarities and differences between their levels of motivation and athleticism. Are all soldiers and athletes alike, or does it depend

on their level of training (e.g., are more similar characteristics found between elite athletes and elite soldiers compared to the similarities between inexperienced soldiers and novice athletes in terms of motivation levels, resources utilized, and persistence)?

Previous research and this study suggest that these two groups of individuals are similar in many ways, and research in military training could be relevant to the athletic community. With further research findings, a better understanding of the psychosocial resources that these individuals utilize could be developed to create training and preparation for physically grueling challenges that would increase the chances of success.

One of the best things the military can do to reduce soldier attrition is to cultivate an environment (before and during the SFAS training) that encompasses several pretraining exercises that can help the soldiers develop a sense of self-efficacy. It is well established that self-efficacy is related to one's belief in his abilities and motivation to complete a given task. If the military could better prepare soldiers through some form of pretraining, even if the soldiers had to do the pretraining on their own time and set short- and long-term goals to prepare for the upcoming SFAS training program, the soldiers would then have more self-efficacy and motivation when entering the SFAS program and a much better likelihood of success. However, if the military is interested in finding soldiers who already have a strong sense of self-efficacy and feel confident about their abilities to complete the SFAS training, military personnel could administer questionnaires prior to training that would allow them to select only those soldiers who have the above psychosocial characteristics. It is feasible that the same preparation for successful performance could be applied in the athletic arenas. If soldiers and athletes have similar

mindsets, performance anxieties, and need for self-efficacy, then the same procedures could potentially be applicable for both populations.

Another similarity between the military and sports literature is injuries. Over the past 25 years, participation in both individual and team sports has increased dramatically, but a great deal of concern has been generated due to the number of injuries caused each year. During 1984, in the United States, the documented cases of injuries had increased to 3.33 million (Kraus & Conroy, 1984). Twelve years later, a 1996 population survey conducted by Uitenbroek in the United Kingdom revealed that sport/exercise was the single leading source of physical injuries. In athletics, similar to the military, even with the advancement of safety equipment, injuries continue to increase. As the rate of injury increases, researchers in both the military and athletic communities try to determine and understand the factors that cause these injuries. At a conference on soldier performance, I learned from Dr. D. Grahn (personal communication, October, 22, 2003) that Stanford University has developed a thermoregulator device that is being tested on both athletes (college and professional) and soldiers (Special Forces and Navy Seals). This device is designed to increase performance and reduce fatigue. Reducing fatigue helps sustain peak performance and alleviate the negative side effects caused by exhaustion and excessive activity. The preliminary findings are positive, and the thermoregulator has increased performance and reduced fatigue for both the athletes and the military personnel studied thus far. The Stanford research findings are one example of the (physiological) similarities between soldiers and athletes and how each community can benefit from advanced technology in the other. In both the athletic and military communities it is

imperative that individuals stay healthy for performance reasons, as well as for financial reasons.

In summary, it can be theorized that there are many similarities between soldiers' and athletes' psychosocial resources and physical fitness. On the basis of this assumption, it can be hypothesized that similar task preparation, training, and resources used to enhance athletes' performance could be introduced into the military population. If similarities between these two populations do exist, comparable results would be found.

Appendix A

Social Support questions

For questions 1-8 use the following scale:

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

Answer the following questions based on how you feel about your personal and professional relationships **at the present time**.

1. To what extent do you have people you can count on to listen to you talk when you need to talk?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

2. To what extent do you have people you can really count on in a crisis situation?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

3. To what extent do you have people who are willing to steer you out of trouble?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

4. To what extent do you have people who listen to you openly and uncritically to your feelings?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

5. To what extent do you have people who care about you, whether you succeed or fail?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

6. To what extent do you know people who are willing to give you straightforward constructive criticism?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

7. To what extent do you have people to calm you down when you are upset?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

8. To what extent can you count on people to support you when you are making major decisions?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

Appendix B

Mattering questions

For questions 9 - 14 use the following scale:

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

Answer the following questions based on how you feel about your personal and professional relationships **at the present time**.

9. To what extent do you feel needed by other people?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

10. To what extent do others pay attention to you?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

11. To what extent do others miss you after you moved away or changed jobs?

A = Great Extent
B = Large Extent
C = Moderated Extent
D = Slight Extent
E = Not at all

12. To what extent are others interested in hearing what you have to say?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

13. To what extent do others depend on you?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

14. To what extent have you felt that you were a valuable part of your previous unit?

- A = Great Extent
- B = Large Extent
- C = Moderated Extent
- D = Slight Extent
- E = Not at all

Appendix C

General Self-Efficacy questions

For questions 15 - 22 use the following scale:

- A = Strongly Agree**
- B = Agree**
- C = Neither Agree Nor Disagree**
- D = Disagree**
- E = Strongly Disagree**

Using the scale above, please indicate how confident you are in your ability to do each of the following:

15. I will be able to achieve most of the goals I have set for myself.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

16. When facing difficult tasks, I am certain that I will accomplish them.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

17. In general, I think that I can obtain outcomes that are important to me.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

18. I believe I can succeed at most any endeavor to which I set my mind.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

19. I will be able to successfully overcome many challenges.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

20. I am confident that I can perform effectively on many different tasks.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

21. Compared to other people, I can do most tasks very well.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

22. Even when things are tough, I can perform quite well.

- A = Strongly Agree
- B = Agree
- C = Neither Agree Nor Disagree
- D = Disagree
- E = Strongly Disagree

Appendix D

Expected Stress questions

For questions 23 - 25 use the following scale:

- A = Extremely stressful**
- B = Very stressful**
- C = Moderately stressful**
- D = Slightly stressful**
- E = Not at all stressful**

Using the scale above, please indicate how stressful you expect each of the following:

23. How stressful do you expect the PHYSICAL EXERTION aspects of SFAS to be?

- A = Extremely stressful
- B = Very stressful
- C = Moderately stressful
- D = Slightly stressful
- E = Not at all stressful

24. How stressful do you expect the EMOTIONAL PRESSURE aspects of SFAS to be?

- A = Extremely stressful
- B = Very stressful
- C = Moderately stressful
- D = Slightly stressful
- E = Not at all stressful

25. How stressful do you expect the COGNITIVE/LEARNING aspect of SFAS to be?

- A = Extremely stressful
- B = Very stressful
- C = Moderately stressful
- D = Slightly stressful
- E = Not at all stressful

Appendix E

Cognitive Stress Response

For questions 1-7 use the following scale:

- A = Almost Always**
- B = Very often**
- C = Often**
- D = Sometimes**
- E = Seldom**
- F = Hardly Ever**

Using the scale above, please indicate how often you have felt the following **since arriving at SFAS**:

1. In the last week, how often have you been upset because of something that happened unexpectedly?

- A = Almost Always
- B = Very often
- C = Often
- D = Sometimes
- E = Seldom
- F = Hardly Ever

2. In the last week, how often have you felt that you were unable to control the important things in your life?

- A = Almost Always
- B = Very often
- C = Often
- D = Sometimes
- E = Seldom
- F = Hardly Ever

3. In the last week, how often have you felt nervous and “stressed”?

- A = Almost Always
- B = Very often
- C = Often
- D = Sometimes
- E = Seldom
- F = Hardly Ever

4. In the last week, how often have you found that you could not cope with all of the things that you had to do?

A = Almost Always
B = Very often
C = Often
D = Sometimes
E = Seldom
F = Hardly Ever

5. In the last week, how often have you been angered because of things that happened that were outside of your control?

A = Almost Always
B = Very often
C = Often
D = Sometimes
E = Seldom
F = Hardly Ever

6. In the last week, how often have you found yourself thinking about things that you have to accomplish?

A = Almost Always
B = Very often
C = Often
D = Sometimes
E = Seldom
F = Hardly Ever

7. In the last week, how often have you felt difficulties were piling up so high that you could not overcome them?

A = Almost Always
B = Very often
C = Often
D = Sometimes
E = Seldom
F = Hardly Ever

Appendix F

Injury and Illness questions

1. What parts of your body were injured during SFAS? (Mark all that apply)

None Knees Legs Other
Feet Hands Arms
Ankles Back Neck

2. Which illnesses did you have during SFAS training? (Mark all that apply)

None Bacterial Infection
Cold Allergy/Skin problem
Flu/Fever Other
Diarrhea

Severity Questions

3. Overall, how severe were the aches and pains you sustained in SFAS?

- A. I did not experience any aches/pains in SFAS
- B. They were minor aches/pains
- C. They were moderate aches/pains
- D. They were severe aches/pains
- E. They were very severe aches/pains

4. Altogether during SFAS, how long were you in pain from various injuries/illnesses?

- A. I did not experience any aches/pains
- B. Half a day or less
- C. About a day
- D. Several days
- E. A week or two
- F. The entire time – 3 weeks

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