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LONELINESS AND USE OF COPING MECHANISMS AMONG  
US MILITARY PERSONNEL DEPLOYED TO  
THE MIDDLE EAST

by

David A. Shwalb

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Psychology

Brigham Young University

August 2007

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a thesis submitted by

David A. Shwalb

This thesis has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

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As chair of the candidate's graduate committee, I have read the thesis of David A. Shwalb in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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## ABSTRACT

### LONELINESS AND USE OF COPING MECHANISMS AMONG US MILITARY PERSONNEL DEPLOYED TO THE MIDDLE EAST

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Master of Science

Considering that the greatest fear of deploying military personnel is separation from family, an obvious and overlooked psychological phenomenon that merits further investigation is loneliness. In this study, 131 US troops completed the UCLA Loneliness Scale, Anxiety Control Questionnaire, and a leisurely activity participation scale to predict loneliness with participation in non-work activities in the presence of another moderator (locus of control) and various demographic factors. As hypothesized, the results indicated that 1) the best non-work activity predictors of loneliness were emailing friends and listening to music, 2) external locus of control was positively correlated with loneliness and internal locus of control was negatively correlated with loneliness, and 3) loneliness was positively correlated with length of time deployed.

## ACKNOWLEDGEMENTS

I would like to express appreciation to my committee members for their support and assistance throughout this process. I would also like to thank Dr. Timothy Smith for his invaluable contributions to the development and completion of my thesis.

## DEDICATION

I would like to dedicate this thesis to my wife, Allison, and to my son, David, who together make everything I do possible and worth while.

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## Loneliness and Use of Coping Mechanisms

### Among US Military Personnel Deployed to the Middle East

The fact that traumatic and stressful deployment experiences are associated with a wide range of negative mental-health consequences is well established. For instance, such issues include depression, overwhelming anxiety, withdrawal, impairment of functioning, suicidal ideation, aggression, and posttraumatic stress disorder (Hoge, Auchterlonie, & Milliken, 2007; Solomon & Mikulincer, 1990; Vogt, Pless, King, & King, 2005). Some of these mental-health effects can be immediate and short-lived (e.g. anxiety, withdrawal), while others continue to persist over a person's lifetime (e.g. PTSD) (Solomon & Mikulincer, 1990). Recent reports on the mental-health condition of Americans troops returning from deployments suggest shockingly high levels of negative mental health incidence. For example, 30% of troops returning from the war in Iraq report experiencing some type of mental health problem and 16% experienced acute stress or PTSD (Britt, 2007). The gravity of such reports is amplified with a realization that the conditions which are thought to have produced such effects are worsening

As the number of American troops with mental health issues rises, the conditions that contribute to the rise of such effects are also mounting in a variety of ways. First, the number of military personnel deployed to war-zones has dramatically increased (Britt & Adler, 2003). Currently half a million members of armed forces from 110 different nations are deployed outside of their own countries in support of the War on Terror or other peacekeeping operations –roughly 73% of which are American troops (Britt & Adler, 2003; Global Security, 2007). Secondly, the length of deployments has steadily increased. While initial deployments lasted anywhere from six months to one year,

troops are now expected to serve tours of 15 to 21 months (Raum, 2007). Finally, conditions in Iraq and Afghanistan seem to be becoming increasingly violent as evident by the ever increasing number of annual coalition, civilian, and insurgent deaths reported since the beginning of the conflict in 2003 (Coalition Causality Count, 2007).

As various factors of deployments have changed (e.g. frequency, length, and intensity), subsequent attempts to understand the effects of these deployments on troops' mental health have also changed (Vogt et al., 2005). Historically, the vast majority of studies on deployment stressors focused on exposure to combat events (e.g. firing a weapon, being fired at, witnessing injury or death, etc.) to the exclusion of other possible sources of stress (Vogt et al., 2005). In explaining posttraumatic event outcome, almost all research conducted prior to the war in Iraq relied exclusively on posttraumatic stress disorder (Weiseth, 2003). Although the majority of current studies still focus on combat events and PTSD, other variables such as depression, anxiety, coping and attachment styles, and defense mechanisms are receiving considerably more attention (Barak et al., 2000; Vogt et al., 2005).

While the number of variables investigated in military research has expanded, the current range of research is still far from sufficient. Considering the increasing length of deployments and the fact that the number one fear of deploying troops is separation from family (Limbert, 2004), one obvious psychological phenomenon that merits further investigation is loneliness. To date, very few studies have investigated the effects of loneliness in a military setting (Dasberg, 1982; Shelar, 1991; Solomon, Mikulincer, & Hobfoll, 1986), and none have done so using the accepted standard for measuring loneliness –the UCLA Loneliness Scale– of troops serving in combat zones. Solomon et

al. (1986) and Dasberg (1982) studied combat troops, but assessed loneliness by simply asking soldiers if they were lonely or not. Shelar (1991) utilized the UCLA Loneliness Scale, but her sampled population was not deployed to a combat zone. Deployment in a combat zone provides a unique environment to study the phenomenon of loneliness.

Loneliness is certainly not unique to military personnel, but those serving overseas in combat zones are exposed to a number of factors associated with increased loneliness. Research shows that the degree, frequency, and quality of loneliness may be understood in terms of both a person's mental health and the environment in which he or she lives (Shelar, 1991). Environments that contribute to loneliness often include one or more of the following conditions: a) events in the environment are often perceived as being outside of the person's control; b) people are often involuntarily placed in this environment; c) the environment is highly structured; and d) the environment is one in which individuals are pressured by others (Lang & McNiel, 2006). Based on empirical and anecdotal evidence, such descriptions are highly characteristic of most military deployments (Britt, 2007). As such, deployed soldiers are at a greater risk for becoming lonely. Given that deployments may lead to loneliness, variables that could be associated with this negative mental-health outcome ought to be investigated.

The Soldier Adaptation Model (Bliese & Castro, 2003) has been used since the mid-1980s to guide military research. This model is an attempt to categorize variables associated with deployments into one of three major groups –*stressors*, *moderators*, and *strains*. Stressors include the functional and assumed stresses within the deployment environment that place a load or demand on troops (Jex, Beehr, & Roberts, 1992). Moderators are all constructs that attenuate the relationship between stressors and

negative outcomes. They include personal moderators (e.g. self-efficacy) and organizational moderators, which are efforts by the military to moderate the demands placed on individual soldiers (e.g. providing soldiers with leave-passes). Moderators are arguably the most critical component of the model because they encompass interventions and represent the constructs that contribute to soldier adaptation (Bliese & Castro, 2003). Strains are the measurable outcomes that result from being deployed.

Using the Soldier Adaptation Model to investigate the relationship between various coping mechanisms (i.e. use of non-work related activities and locus of control) and loneliness has very real implications to the well-being of military personnel and their families. Loneliness is thought to contribute to a number of other negative psychological phenomenon such as aggression, depression, and anxiety (Rook, 1984; Solomon et al., 1986). These mental health issues have been shown to decrease soldiers' heartiness against developing combat stress or PTSD (Dirkzwager, Bramsen, & Ploeg, 2005; Vogt et al., 2005). The effects of such posttraumatic event outcomes reach far beyond the battlefield, affecting the wellbeing of soldiers and their families for years (Solomon & Mikulincer, 1990). Such negative consequences can, however, be attenuated by investigating factors that could possibly decrease the loneliness of soldiers on deployment.

Therefore, as was the case in this study, the Soldier Adaptation Model allows for the systematic exploration of relationships among variables of interest. The stressors experienced by the subjects in this study include those well established by prior studies to exist in all combat zones. Such stressors are separation from family, being in unfamiliar surroundings, and the possibility of enemy attack (Alder, Litz, & Bartone, 2003; Newby,

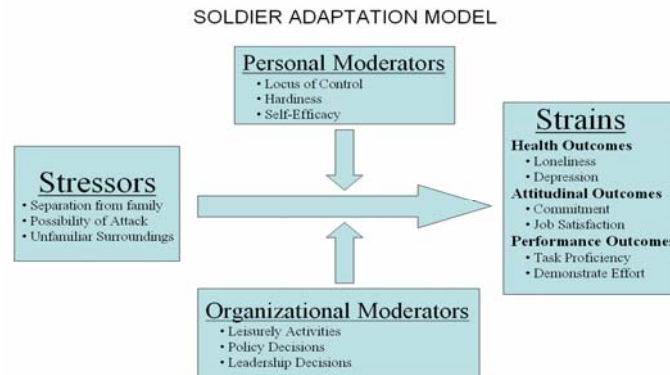
2005). Participation in certain activities and an internal locus of control have been shown to increase one's resistance against stressors (Solomon & Mikulincer, 1990; Trenberth & Dewe, 2002). Consequently, the moderators selected for investigation in this study include participation in non-work related activities (an organizational moderator) as well as locus of control (a personal moderator), as measured by the Anxiety Control Questionnaire (ACQ) (Lang & McNiel, 2006). The strain of this study is loneliness as measured by the UCLA Loneliness Scale (Russell, 1980). This study, therefore, highlights the ability of one specific moderator (i.e. participation in non-work related activities) in the presence of another moderator (i.e. locus of control) to attenuate the effects of loneliness among American military personnel deployed to combat zones in the Middle East. In sum, the purpose of this study was to examine the effects of participation in non-work activities and locus control on loneliness with American soldiers who were deployed in Middle Eastern countries.

## Literature Review

### *Soldier Adaptation Model*

In an effort to maintain a common linguistic terminology among researchers, develop consensus regarding the placement of various constructs within the framework of stress research, categorize variables collected in survey research and archival sources, and develop a better understanding of the relationships between variables, the meta-theory Soldier Adaptation Model (SAM) has been utilized by military researchers investigating deployments for almost 30 years (Bliese & Castro, 2003). The theory is an attempt to organize all variables into one of three constructs: stressors, moderators, and strains (see Figure 1).

Figure 1. Soldier Adaptation Model



The first variable of the SAM model is military stressors. This construct includes the functional and assumed stresses within the deployment environment that place a load or demand on troops (Jex et al., 1992). This variable assumes that stressors exist in any given military environment (garrison, training, or deployment) and that the stressors differ in each unique setting. For instance, in a garrison location, balancing family and work life might be a major stress, whereas during a deployment, stresses associated with social isolation and novelty of the situation could be more predominant (Bartone, Vaitkus, & Adler, 1998).

The second component of the SAM model includes moderators. Moderators are all constructs that attenuate the relationship between stressors and negative outcomes. They include personal moderators (e.g. locus of control) and organizational moderators, which are efforts by the military to moderate the demands placed on individual soldiers (e.g. the leisurely activities soldiers may choose to participate in during their off time).



Moderators are arguably the most critical component of the model because they encompass interventions and represent the constructs that contribute to soldier adaptation (Bliese & Castro, 2003).

The final component of the SAM model is strains. Strains are the measurable outcomes that result from being deployed. Most military research classifies outcome into one of three major categories: health, attitude, or performance (Bliese & Castro, 2003). The fact that traumatic and stressful deployment experiences are associated with a wide range of negative mental-health consequences is well established. While a wide range of variables have been investigated (e.g. depression, overwhelming anxiety, withdrawal, impairment of functioning, suicidal ideation, aggression, and posttraumatic stress disorder) many more health-related variables have yet to be examined –such as loneliness (Hoge et al., 2007; Solomon & Mikulincer, 1990; Vogt et al., 2005).

#### *Deployment Conditions (Stressors)*

Less than one month after the September 11<sup>th</sup> terrorist attacks on the United States, Operation Enduring Freedom (OEF) began in Afghanistan. This marked the beginning of the “War on Terror.” Subsequently, the United States and a number of other countries expanded this conflict throughout the Middle East, Asia, and Africa into what has become the largest sustained ground operation since the Vietnam War (Hoge et al., 2006; Limbert, 2004). Currently half a million members of armed forces from 110 different nations are deployed outside of their own countries in support of this war or other peacekeeping operations –roughly 73% of which are American troops (Britt & Adler, 2003; Global Security, 2007). According to Lazarus and Folkman (1984), certain aspects of the deployment environment may increase soldiers’ risk for stress and anxiety.

Researchers investigating the causes of stress have identified four components of an environment that tend to increase one's level of stress –all of which are acutely present during most military deployments (Litz, 1996 ). The first condition is novelty. In other words, the more new or unique the experience is, the more stressful it generally is. Most military personnel typically deploy only once, if at all, and research has shown that this first deployment is the most stressful for those who have deployed multiple times (Martinez, Huffman, Adler, & Castro, 1999). The second condition is predictability. The less predictable a situation is, the more stress provoking it will generally be. Combat zones tend to be incredibly unpredictable, as insurgents constantly modify their tactics and often rely on the element of surprise. Third, the longer the duration of the stressor, the more stressful it tends to be to the individual. While actual combat may occur in short spurts if it occurs at all, the deployment itself is a major stressor which can last up to two years. Finally, the more ambiguous (i.e. less necessary information for appraisal of the situation is available) the situation appears, the more stressful the experience will generally be. For instance, in many peacekeeping missions, it is often difficult to distinguish the enemy from the rest of the local population, all while trying to apply the rules of engagement and stay alive (Britt, 1998).

Unfortunately, many factors associated with increased levels of stress in deployment settings are becoming more salient. For instance, the length of tours has greatly increased. Initial deployments lasted six months for members of the active component of the Army and one year for members of the National Guard. Active duty deployments are currently one year long, while National Guard units are strained with 18-month long tours. Recently, the military has been told to anticipate an addition of four

months for all future deployments (Raum, 2007). In addition to the increasing length of tours, the environment for many deployed military personnel is becoming more hostile, as evident by the increasing annual number of coalition, civilian, and insurgent casualties since 2001 (Coalition Casualty Count, 2007).

It is true of course that not all individuals who are deployed overseas, even to a combat zone, ever experience actual combat. For such individuals (including the subjects in this study from Kuwait and Qatar), their deployment environments are still uniquely stressful and anxiety provoking (Newby, 2005). Combat aside, almost all individuals on deployments report experiencing the following stressors: being separated from home, enduring limited communication with family members or friends, being bored, having future plans interrupted for long and uncertain periods of time, realizing the possibility of being extended or deployed again, living with the constant potential of insurgent attacks, and feeling a heightened sense of vigilance (Adler et al., 2003; Newby, 2005).

#### *Coping (Moderators)*

The degree, frequency, and quality of individuals' loneliness will depend on a number of various factors, including their methods of coping with stressors (Shelar, 1991). In their pioneering work on coping, Folkman and Lazarus defined this construct as the "cognitive and behavioral efforts made by individuals to master, tolerate, or reduce external and internal demands and conflicts among them to manage or alter the person-environment relationship that is the source of stress and to regulate stressful emotions" (Folkman & Lazarus, 1980, p. 223). Coping, therefore, is defined in terms of the strategies and mechanisms that people use to modify their environment or reduce internal distress. While coping includes all efforts to manage stress, regardless of its

effectiveness or soundness (Folkman, 1984), coping is generally organized into four broad categories (Moldjord, Fossum, & Holen, 2003).

The first category of coping includes all efforts to practically handle stressors and includes two subcategories: problem-focused coping and restraint (Moldjord et al., 2003). Problem-focused coping is the practical and physical dealing with stressors and is defined in terms of the active part of problem solving. Examples may include planning, taking direct action, or seeking assistance. Restraint is another type of practical handling of stressors and involves waiting for an appropriate opportunity to act (Carver, Scheier, & Weintraub, 1989). In a military setting, an example might include keeping a threatening situation from escalating by restraining oneself from using force.

In situations where problems can be addressed in some constructive way, problem-focused coping is a viable option for handling stressors. However, in certain situations where problems cannot be actively addressed, individuals must find means to endure (Carver et al., 1989). Such approaches are referred to as cognitive or internal strategies. Cognitive processes achieve this goal of enduring mentally by avoiding, minimizing, distancing, or seeking value in negative events. A commonly used example of this approach is denial, whereby individuals simply refuse to acknowledge certain facts or their implications. Behavioral-cognitive approaches are attempts by individuals to distract themselves from distress. Examples of such distracting behavior could include card playing, reading, writing letters, seeking entertainment, or exercise, and are among the activities assessed in this study (Eriksen, Olf, & Ursin, 1997).

The third category of coping includes efforts to diminish stress by utilizing available situational or environmental factors. The most commonly investigated

mechanism of coping with the use of environmental factors is social support (Moldjord et al., 2003). A supportive social environment moderates stress in two main ways. First, when individuals are exposed to a potentially threatening or stressful environment, their stress levels typically decrease proportionally with the extent to which they feel their emotions and behaviors are both understood and supported by their comrades. Secondly, in such stressful situations, stress levels are decreased when people know that they can rely on others to address the problem and when they do not have to make difficult decisions alone (Kobasa, Maddi, Puccetti, & Zola, 1985).

The last broad category of coping includes personal approaches, or in other words, individuals' cognitive orientations. Viewed as both coping mechanisms and more broadly as predispositions for coping, such constructs include an individual's hardiness, sense of coherence, and locus of control. Hardiness is a measure of an individual's emotional resilience in the face of stressors (Moldjord et al., 2003). Sense of coherence is individuals' acknowledgement of the world as an often challenging place and their willingness to view stressful situations as opportunities to learn (Antonovsky, 1979). Individuals' locus of control is considered either internal (i.e. when they tend to attribute environmental events to themselves) or external (i.e. when they tend to attribute environmental events to things outside of their power (Solomon, Mikulincer, & Avitzur, 1988). The manifestation of any coping mechanism, such as locus of control, may largely depend on the unique features of the environment and stressors with which individuals must cope. The military, for instance, provides an incredibly unique environment in which to investigate coping strategies.

*Leisurely Activities: Behavioral-Cognitive Coping Mechanisms (Unit Moderator)*

Participation in non-work related activities is among the more common coping strategies identified for dealing with work related stress. Other common strategies include family support, time management, and counseling. Leisurely activities, or non work-related activities, include all tasks that are intended to or have the effect of diminishing or correcting pathology and promoting or maintaining an individual's health (American Occupational Therapy Association, 1991). While such a definition may seem rather broad, most research on leisurely activities tends to view such functions in three principle ways: leisure as time, leisure as an experience or state of mind, and leisure as activity (Primeau, 1995). The first definition, leisure as time, is easily quantifiable and is therefore commonly investigated. In these studies, leisure is viewed as all time other than that occupied by obligatory activities (e.g. eating, sleeping, etc.) and sustaining activities (e.g. working to earn money). This view is problematic, however, because it defines leisure in terms of what it is not, is temporally bound, and ignores the possibility that work could potentially provide an experience comparable to leisure (Tinsley & Tinsley, 1982).

Such problems when viewing leisure as time led to the development of other viewpoints, including leisure as a state of mind or experience. Theorists who view leisure in this light focus less on time or type of leisure and more on the quality of activities and the meanings that individuals prescribe to various pursuits (Csikszentmihalyi, 1975). In such qualitative studies, researchers found that a number of common characteristics among leisurely pursuits distinguish them from more work-related activities. Individuals generally consider an activity to be leisurely if they are free

to choose whether or not to participate and if the activity is enjoyable, unrelated to their work, novel, and free from evaluation or assessment (Iso-Ahola, 1979).

While the quality offered by such studies is a clear benefit to the investigation of leisure, it is only in the final view of leisure, as specific activities, that researchers are able to conduct research aimed at establishing trends, discovering patterns, or documenting populations' participation in specific activities (Gunter & Stanley, 1985). Activity-type definitions of leisure include all behaviors which meet the qualitative characteristics that most people agree are necessary for an activity to be considered leisurely (e.g. non-obligatory, enjoyable, unrelated to work, novel, free from assessment, etc.). In this sense, they take advantage of the insight offered by qualitative research (and thus avoid the pitfalls of time-based leisure studies) while still being able to provide more generalizable quantitative information on the types and frequency of activities in which people participate in outside of work settings and their relation to other variables of interest –such as loneliness, locus of control, and leisure as a coping mechanism.

A number of studies have documented the effectiveness of various activities in coping with stressful situations (Forgas, 1996; Shaw & Gant, 2002). Such strategies could be viewed as a form of behavioral-cognitive coping. In other words, in situations in which stressors cannot be removed, individuals can endure by utilizing behavioral mechanisms such as leisure activities (Carver et al., 1989). With the use of cognitive processes, individuals achieve this goal of enduring mentally by avoiding, minimizing, distancing, or seeking value in negative events. A commonly used example of this approach is denial, whereby individuals simply refuse to acknowledge certain facts or their implications. Behavioral-cognitive approaches are attempts by the individuals to

distract themselves from distress. Examples of such distracting behavior could include reading, writing letters, seeking entertainment, exercising, or using the internet for recreational purposes (Eriksen et al., 1997; Forgas, 1996; Shaw & Gant, 2002).

Participation in such behaviors has been used to predict a wide range of mental health outcomes –including loneliness. One researcher, for example, purported that using the internet for computer-based entertainment was an effective coping mechanism for attenuating the effects of loneliness (Shaw and Gant, 2002). The results of another study which investigated loneliness among military personnel in a garrison setting indicated that for this particular population, watching television, reading, and listening to the radio were effective coping mechanisms which could be used to predict lower levels of loneliness (Shelar, 1991). Based on these results, the first hypothesis of this study is that the most effective behavioral-cognitive coping mechanisms for dealing with loneliness (and therefore, the best predictors) would be emailing family, emailing friends, watching television, and listening to music.

*Locus of Control: Personal Approach Coping Mechanisms (Personal Moderator)*

In an effort to better understand individuals' perceived control over their environment and the events that occur in their lives, a number of various constructs have been defined and investigated over the past 40 years. One of the leading explanations of perceived control since the 1970s has been locus of control. Developed as part of Rotter's social learning theory, locus of control initiated as a behaviorist notion that a person's actions may be predicted from a number of various factors, including their expectations about certain behaviors' effects on the incidence of reinforcements in particular situations (Rotter, 1966). Subsequent research has expanded the constructs'



use for predicting a wide range of behaviors and has spurred the creation of specialized instruments to measure perceptions of control in specific environments.

The central tenet of locus of control theory can be understood in terms of individuals' generalized expectancy regarding their perception of the causal relationships between behavior and outcome. More specifically, it is their belief (conscious or unconscious) or attitude towards the degree of effectiveness of their behavior in achieving a desired result (Lefcourt, 1966). In any given situation, an individual may have a more internal or external locus of control. An internal locus of control refers to the belief or attitude that events and outcomes are controlled by one's own behaviors or personal attributes (Lang & McNiel, 2006). In contrast, individuals with an external locus of control subscribes in one way or another to the idea that events and outcomes are beyond their control, regardless of their behavior or attributes (Solomon & Mikulincer, 1990). In most situations, researchers generally consider an internal locus of control to be more desirable and favorable to an individual's wellbeing.

Researchers have associated an individual's locus of control with or used it to predict a wide range of behaviors and personal attributes. The findings of such research suggest that individuals with an internal locus of control are generally more likely to exhibit self health-promoting behaviors as compared to those with an external locus of control. For instance, individuals with an internal locus of control are more likely than individuals with an external control to take inoculations (Debbs & Kirscht, 1971), use seat belts when driving (Williams, 1972a), have regular dental examinations (Williams, 1972b), meet goals in weight reduction programs (Balch & Ross, 1975), and persist in required medical treatment (Strickland, 1978). Internal locus of control has also been

negatively correlated with depression, medical problems, employment problems, and general psychiatric problems in comparison to external locus of control (Lang & McNiel, 2006). Researchers have concluded that an internal locus of control also improves social functioning, gives greater resistance to psychological dysfunction, and promotes physical health (Solomon & Mikulincer, 1990). Given the associations between self health-promoting behaviors and internal control and between negative health behaviors and external locus of control, the second hypothesis of the present study was, therefore, that loneliness would be negatively correlated with internal locus of control and consequently positively correlated with external locus of control.

While the breadth of behaviors and personal attributes predicted by Rotter's construct remains one of his theory's most impressive qualities, early measurements of locus of control have been criticized as being too broad and unidimensional (Lang & McNiel, 2006). As early as 1974, researchers recognized the presence of several factors in the locus of control measurements (e.g. the belief that events in one's life are organized by powerful others or are due chance) (Collins, 1974). As researchers identified these other factors and were thus able to better understand the components of locus of control, instruments designed to measure locus of control became increasingly sophisticated and specialized (Lang & McNiel, 2006; Lefcourt, 1966). For example, while two surveys may still report individual leanings towards internal or external locus of control, one survey might explain the various ways in which people respond to threats, while the other could predict how one copes with stressful environments.

The survey used in this study, the Anxiety Control Questionnaire (ACQ), was developed specifically to measure perceived control over threatening events and reactions

to threats (Lang & McNiel, 2006). While the construct is considered to be particularly useful in psychiatric inpatient settings, similarities between such an environment and the military make it ideal for measuring locus of control of individuals serving on deployments. For example, the environmental characteristics of inpatient settings that were considered when designing the ACQ were involuntary treatment, pressure by others to adhere to rules, and highly structured schedules. As such, this survey would clearly be well suited for measuring locus of control on military deployments as well.

*Loneliness (Strains or Outcomes)*

Loneliness is a very prevalent condition. While everyone will experience feelings of loneliness at some point in their life, the pervasiveness of more persistent and socially debilitating loneliness is alarming. Roughly 10 to 15% of the adult population in the United States, for instance, feel lonely all of the time and consider loneliness to be a serious personal problem in their lives (Heinrich & Gullone, 2006; McWhirter, 1990). Other studies show that while up to 79% of people occasionally feel lonely, approximately 15 to 30% of people reports experiencing persistent feelings of loneliness that have a negative impact on their everyday lives (Heinrich & Gullone, 2006). Rates of loneliness are even higher among women and certain minority groups (Stokes, 1985).

Despite the pervasiveness of loneliness, however, very little research was conducted on this psychological phenomenon until recently. One major reason for this lack of empirical research on loneliness concerns methodological weaknesses. A major hindrance to the investigation of loneliness was that until the development of the UCLA Loneliness Scale, no reliable tool to assess feelings of loneliness existed (McWhirter, 1990; Russell, Peplau, & Ferguson, 1978). While unpublished scales did exist as early as

1964, they suffered from an assortment of shortcomings (Russell et al., 1978). For example, early surveys on loneliness were generally lengthy, ranging anywhere from 38 to 100 items. Other weakness of these earlier surveys also involved lower internal consistency and poor assessments of external validity (Russell et al., 1978).

In addition to methodological inadequacies, another major reason very little research was conducted on loneliness until recently involves misconceptions about the nature of loneliness. Traditionally, loneliness was regarded as a symptom or a mere part of more global manifestations of psychological distress (McWhirter, 1990). For instance, early studies associated loneliness with a wide range of other variables, including depression (Bragg, 1979; Horowitz, French, & Anderson, 1982; Selingson, 1982; Young, 1982), suicide and suicidal ideation (Gove & Hughes, 1980), hostility and passiveness (Sermat, 1980), alcohol abuse (Loucks, 1980), adolescent delinquency (Brennan & Auslander, 1979), aggressiveness (Sermat, 1980), physical illness (Lynch, 1977), and anxiety (Weiss, 1973). It was not until 1980 that the seminal work of Russell showed, thanks to the UCLA Loneliness Scale, that while correlated with a number of other measures of negative affect, loneliness was, in fact, a distinct psychological phenomenon (Russell, 1980).

The understanding that loneliness is a distinct psychological experience and the development of a reliable tool that addressed the inadequacies of earlier scales for measuring it enabled researchers to expand their investigation of loneliness. Most researchers are in agreement that the phenomenon encompasses the following three characteristics (McWhirter, 1990). First, loneliness is almost always a negative experience. While positive consequences can ensue from voluntary isolation, loneliness

is usually distressing and is associated with sadness, anxiety, anger, self-deprecation, boredom, and feelings of marginalization (Rook, 1984). Secondly, loneliness is not synonymous with being alone. While feelings of loneliness are often the most debilitating when coupled with physical isolation from others, loneliness can occur as a result of a lack of *quality* in social relationships as well. For instance, research has shown that unloving marriages often result in feelings of loneliness, despite the presence of family (Levinger, 1979). The final characteristic of loneliness is its temporal quality. That is, loneliness can be experienced for brief periods of time, over the course of a lifetime, or anywhere in between (Young, 1982). Based on such characteristics, perhaps the most comprehensive definition of loneliness to date was offered by Rook (1984):

Loneliness is defined as an enduring condition of emotional distress that arises when a person feels estranged from, misunderstood, or rejected by others and/or lacks appropriate social partners for desired activities, particularly activities that provide a sense of social integration and opportunities for emotional intimacy. (p.1391)

Loneliness is certainly not unique to military personnel, but certain characteristics of combat zones may place troops at a greater risk for becoming lonely. As previously mentioned, researchers investigating the causes of stressors have identified several components of an environment that tend to increase one's level of stress and likelihood for becoming lonely (Litz, 1996). First, the longer the duration of the stressor, the more stressful it tends to be to the individual, the less they feel in control (i.e. external locus of control), and therefore the more likely they would be to become lonely. While actual combat may occur in short spurts if it occurs at all, the deployment itself is a major stressor which can last up to two years. Secondly, the more ambiguous (i.e. less necessary information for appraisal of the situation is available) the situation seems to the

individual, the more likely it is to be stressful. The longer one's tour of duty is, the farther away the end of the stressor is and the more uncertain and ambiguous the stressor would seem.

As researchers become more knowledgeable regarding loneliness, methods of intervention have also become increasingly sophisticated. The earliest work focused on the sensitivity of mental health workers and counselors in detecting loneliness as a separate and overlooked clinical issue (Fromm-Reichmass, 1959). Today, most interventions are client centered and are based on one of three major approaches (Rook, 1984). First, certain interventions may attempt to help individuals suffering from loneliness by aiding them in establishing more satisfying interpersonal ties. Such interventions generally focus on improving peoples' interpersonal skills or helping them find new opportunities for social contact. Another approach to intervention may not attempt to alleviate loneliness, but rather may attempt to prevent feelings of loneliness from digressing into or contributing to other serious problems such as depression or suicide. Thus, in cases when it is not possible to improve an individual's social situation, service providers may assist lonely individuals in coping with their struggles. Finally, a third approach of many researchers is prevention of loneliness. This approach is most often used with groups that are at high risk for increased levels of loneliness, such as the military. In such cases, researches may focus on providing individuals with increased access to activities considered to be effective coping mechanisms.

### Summary of Hypotheses of the Present Study

#### Hypothesis 1 [Loneliness and Leisurely Activities]:

Based on the findings of similar research (Shaw & Gant, 2002; Shelar, 1991), the most effective behavioral-cognitive coping mechanisms for dealing with loneliness (and therefore, the best predictors) would emailing family, emailing friends, watching television, and listening to music.

#### Hypothesis 2 [Loneliness and Locus of Control]:

Based on literature of loci of control, loneliness would be positively correlated with external locus of control and negatively correlated with internal locus of control.

#### Hypothesis 3 [Loneliness and Demographic Factors]:

Based on similar research (Shaw & Gant, 2002; Shelar, 1991), loneliness would be positively correlated with length of tour.

### Method

#### *Participants*

Data were collected from 138 members (94 males, 44 females) of the armed forces serving unaccompanied tours throughout the Middle East (see Table 1 for complete demographic information). The sample included soldiers, airmen, and marines stationed in Afghanistan, Iraq, Kuwait, and Qatar. The average length of tour was 331 days, with the average time already served by members of the sample being 175 days. Participants' military components included the active duty Army and Marines, Army and Air National Guard, and Army and Air Force Reserves. The majority of the sample were Caucasian (n=83), followed by African Americans (n=28) and Hispanics (n=16). The

range of enlisted grades was E-2 to E-9, with 75% of the sample falling between E-4 to E-6. The range of officer grades was 0-1 to 0-5, with 75% of the sample included in 0-1 to 0-3. A majority of the sample was single (n=61), while 51 participants reported being married and 6 reported being divorced. Slightly Less than 2/3rds of individuals reported belonging to a Christian denomination, while remaining participants reported having no religious preference. The average age of participants was 30 and ranged from 18 to 55.

Upon receipt of the administered surveys, the researcher observed that one of the forms contained identical responses for all items (i.e. the individual had marked “3” in response to all questions). That particular survey was discarded on the assumption that the participant had not completed the survey accurately. Descriptive analyses of participant response further revealed that six additional participants had provided nonsensical rating to at least seven of the items regarding their personal behavior while serving overseas. For instance, such individuals claimed to attend religious services, call family members and friends, go off base, visit bars and clubs, and take naps hourly while serving in a combat zone. It was therefore inferred that these participants had either misunderstood the directions or did not accurately complete the survey, and their responses were therefore removed from subsequent analyses. The total number of surveys included in the final analysis of this study was, therefore, 131.

### *Measurement*

*The UCLA Loneliness Scale (ULS-8) (Hays & DiMatteo, 1987).* While previous studies have indicated that the original ULS-20 is the best existing measurement of loneliness (Cronbach’s Alpha-coefficient ranging from .89 to .94), the authors felt that the benefit of a significantly shortened test time (1-2 minutes) was worth the slight



decrease in reliability estimates of the ULS-8 (Cronbach's Alpha-coefficient = .84) (see Appendix A) (Cronbach, 1951; Hays & DiMatteo, 1987; Russell, 1980). Cronbach's Alpha is the most widely used internal consistency coefficient for measuring scale

reliability (Peterson, 1994). The equation for the measurement is  $\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}}$ ,

where N is the number of components (items) and  $\bar{r}$  is the average of all (Pearson) correlation coefficients between the components (Peterson, 1994). The measurement consisted of eight items assessing the satisfaction and dissatisfaction of current social relations, with a 4-point Likert response format. The wordings of the items are consistent with the revised version of the ULS-20 (Version 3) (Russell, 1980).

Two items that were originally negatively worded (item number 3, "How often do you feel outgoing and friendly?" and item number 6, "How often do you feel you can find companionship when you want it?") were excluded from the analyses because a preliminary principal components analysis (PCA) indicated that they together accounted for a unique factor relative to the other items. PCA is a statistical approach used to analyze interrelationships among variables and to explain these variables in terms of their common underlying dimensions (factors) (Hill & Lewicki, 2006). Unlike factor analysis which ignores the error variance (i.e. the variance not accounted for by the correlation coefficients), PCA is designed to account for all of the variance including that found in the correlation coefficients and error variances. In this study (for a detailed description of the source and equations used by SPSS to conduct a PCA, see Field, 2005, chapter 15), the correlations (loadings) between each item on the survey and the overall factors are used to determine how strongly the items are related to the underlying dimension (factor) of the survey (i.e. loneliness). In the PCA on the UCLA Loneliness scale, two factors

were extracted based on the guidelines to include factors with an eigenvalue above 1 (Kaiser, 1960). Eigenvalues represent the variance in a set of variables explained by a factor or component and are denoted by lambda:  $\lambda_k = \sum_{i=1}^m a_{ik}^2$ , where  $a_{ik}$  is the factor loading for variable  $i$  on factor  $k$ , and  $m$  is the number of variables. Items three and six (the negatively worded items) did not load significantly on the first factor (i.e. loneliness), but instead loaded on a second factor. All other items loaded on the first factor. Based on these findings and in the light of criticisms in the area of psychometrics that negatively worded items can be problematic in scale construction (Weems, Onwuegbuzie, & Schreiber, 2003), the two negatively worded items were not included in the final version of the loneliness scale analyzed in this study.

The internal consistency coefficient (Cronbach's Alpha -coefficient) was .50 for this portion of the data. Because of this lower internal consistency among items, a principal components analysis was conducted to ascertain whether the six remaining items could justifiably be included together in a single scale. In other words, PCA was conducted to determine if these items loaded (correlated with) the first factor (i.e. loneliness). Two factors were extracted based on Kaiser's (1960) rule of including all factors that have an eigenvalue greater than one (the first explaining 29% [eigenvalue = 1.71] of the variance across items and the second explaining 19% of the variance [eigenvalue= 1.13], together accounting for 48% of the variance). All items loaded on the first factor above .479. Equivalent to Pearson's  $r$ , this squared factor loading is the percent of variance in that variable explained by the factor (Hill & Lewicki, 2006). Based on Cicchetti's (1994) guidelines of correlation coefficients, this "fair" correlation indicated that the items could reasonably be combined to form a single scale of

loneliness, as originally intended. For complete descriptions, see items 1, 2, 4, 5, 7, and 8 of Appendix A.

*The Anxiety Control Questionnaire with a 6-point Likert response format (ACQ).* (Rapee et al., 1996). The ACQ was developed to measure individuals' perceived control over threatening events and consisted of two 15-item subscales measuring internal and external locus of control (Lang & McNiel, 2006). In an effort to shorten the ACQ for this study, six items from each of the 15-item subscales were eliminated based on which items had the lowest internal consistency (Pearson's  $r$ ) according to previous studies. Internal consistency of these items were examined by investigating the item-factor correlations (i.e. correlations between an item and the factor score with that item removed) as well as the item-total correlations (i.e. correlations between an item and the total score with that item removed) (Lang & McNiel, 2006). After the survey was administered and an initial analysis was performed, item 4 from the external locus of control subscale was removed because this negatively worded item negatively correlated with all of the other items (even after reversal). In other words, when all of the other items on this scale indicated that an individual had an external locus of control, this one negatively worded item concluded the opposite. This item was removed in light of criticisms among psychometrics that negatively worded items can be problematic in scale construction (Weems, Onwuegbuzie, & Schreiber, 2003). The overall internal consistency for the scale measuring external locus of control was .77 (Cronbach's Alpha - coefficient). The overall internal consistency for the scale measuring internal locus of control was .63 (Cronbach's Alpha -coefficient).

*Personal Behavior Scale.* Participants were also asked to complete a twenty one-item survey regarding their personal behavior while deployed to the Middle East. This survey was developed by the authors after interviewing several military personnel who had been on deployments, reviewing the kinds of activities reported in other studies, and investigating the kinds of activities service members are allowed to participate in under military regulations. Respondents were asked to describe how often (on average) they participated in the activities listed on the survey by marking their choice on a 7-point Likert scale (ranging from ‘never’ to ‘hourly.’)

The final portion of the survey included a demographics section in which respondents were asked to indicate their gender, age, rank/grade, racial or ethnic identification, religious or spiritual identification, branch of service, component (e.g. Active Duty, National Guard, etc.), country deployed to, time deployed, length of tour, and marital status.

#### *Procedure*

Data were collected on Al Udeid Air Force Base in Qatar between August 31<sup>st</sup> and October 3<sup>rd</sup> 2006. All data were collected during personal non-work hours, with the knowledge and permission of appropriate commanders and supervisors, and in accordance with military regulations regarding survey procedures (Department of Defense, 2002). Approval from Brigham Young University’s Institutional Review Board was also received. The process for collecting data varied with respect to the branch of service participants belonged to. Air Force personnel were stationed in Qatar and were therefore approached at various locations on the base during personal time (living quarters, smoking areas, bus stops, etc.) and asked to fill out the survey. Army and

Marine personnel were all en route to the local army post for Rest and Relaxation (R and R) and were merely passing through Al Udeid. These individuals were asked to complete the survey while waiting for transportation to the local Army installation.

The sample of participants in this survey is considered representative of Air Force and Army personnel due to the methods of data collection and the fact that Al Udeid is one of the main hubs for all operations in the Middle East (Starr, 2003). For Air Force service members, surveys were administered at varying times of the day at a variety of locations throughout the installation. These surveys were administered to whoever was at the various locations when the researcher arrived, be it individuals or larger groups. For Army personnel, surveys were administered at varying times of the day to those passing through Al Udeid on 4-day Rest and Relaxation passes. As Qatar is the main center of recuperation for all Army personnel in the region, nearly all Army service members deployed anywhere in the Middle East have to pass through Al Udeid at some point during their tour (Morton, 2006). For both branches of service, given the involuntary nature of most deployments, almost all US military personnel had an equal chance of being deployed to Al Udeid and thus be included in this study.

All participants received a copy of the 2-page survey as well as a consent form outlining the nature of the survey and their rights as participants. Return of the survey constituted consent to participate in the research. Of all individuals approached and asked to complete the survey, 131 agreed to participate in the research and 17 declined. All 148 individuals asked to participate were equally compensated with a token amount of Qatari currency (equal roughly to 18 cents). Upon agreeing to complete the survey, participants were provided with a pen and given basic instruction to complete each section of the

survey and fill in the appropriate demographic information. The survey took approximately five to ten minutes to complete. The surveys were then collected, stored in a locked drawer in the author's quarters, and eventually transported back to the United States for analysis.

### *Statistical Procedure*

First, zero-order correlations among all continuous variables were examined. Next, analyses of variance (ANOVAs) were conducted in order to verify differences across values in categorical (nominal level) data (e.g. gender, branch of military service). The final analysis involved a hierarchical regression model in which subjects' participation in various non-work related activities, loci of control (internal and external), and service characteristics (branch and component) were regressed upon loneliness scores.

Military rank was analyzed separately as both a non-continuous and continuous variable. As a non-continuous variable, each rank (e.g. E-1, E-2, O-1, O-2) constituted a nominal level variable on the survey. As a continuous variable, rank was categorized according to the ascending levels of grade within the military (i.e. junior enlisted, junior non-commissioned officer, senior non-commissioned officer, junior officer, and senior officer) and assigned corresponding values ranging from 1 (junior enlistee) to 5 (senior officer).

### Results

First, zero-order correlations among the variables were examined. Correlational analysis between the three scales (e.g. loneliness, external LOC, and internal LOC) and participation in various activities indicate that loneliness and locus of control was related

to the frequency of certain behaviors (see Table 2). Specifically, as predicted (Hypothesis 1), individuals who more regularly listened to music, hung out with friends, prayed, or emailed family members or friends were less likely to be lonely (see section on regression model for further results pertaining to Hypothesis 1 on pages 30 to 32). Individuals with an internal locus of control were more likely to read books or magazines and were less likely to email their friends.

Comparisons between the three scales (i.e. loneliness, external LOC, and internal LOC) and the continuous variables evaluated in the survey (including the three scales themselves) indicated significant associations across several variables (see Table 3). As hypothesized (Hypothesis 2), both external and internal locus of control were significantly associated with loneliness, but in the opposite direction. External locus of control was positively associated with loneliness, whereas internal locus of control was negatively associated with loneliness. The value of the correlation was higher for the association between external locus of control and loneliness than it was for internal locus of control and loneliness (see section on regression model for further results pertaining to Hypothesis 2 on pages 30 to 32). Additionally, those with a higher rank level (i.e. senior officers as compared to junior enlisted) indicated greater internal locus of control. Also as predicted (Hypothesis 3), loneliness was positively correlated with TDY length. Loneliness was also positively correlated with age and time deployed. Those with a longer TDY length and those who had been deployed longer indicated greater external locus of control.

Next, analyses of variance (ANOVAs) were conducted in order to verify differences across categories of participants with the nominal level variables on the

survey. Analyses with the three scales (loneliness, external LOC, and internal LOC) revealed no significant differences across participants' gender, marital status, religion, race, or military rank (see Table 4, Table 5, and Table 6). However, significant findings were found across military component, branch of service, and TDY location.

Specifically, individuals serving in the National Guard or Reserve were significantly lonelier than those deployed from active duty. Regarding TDY location, individuals who served in Afghanistan were significantly lonelier than individuals serving in the other locations included in this study. Furthermore, individuals serving in Qatar reported having the highest internal locus of control. Concerning branch of service, individuals in the Army appeared to be lonelier than those in the Air Force, and Air Force members tended to have a higher internal locus of control than those in the Army.

The primary analysis was next conducted to address the research question of this thesis. Using statistical software (SPSS), a hierarchical regression was conducted in which loneliness was regressed upon leisure activities after first accounting for locus of control and military service variables. For a detailed description of the source and equations used by SPSS to conduct a hierarchical regression analysis, see Field, 2005, chapter five. In statistics, regression analysis examines the relation of a dependent variable (e.g. loneliness) to specified independent or predictor variables (e.g. participation in leisure activities, locus of control, military service variables, etc.). Hierarchical regression differs from other kinds of regression (e.g. stepwise) analysis in that it is based on the assumption that theoretical concerns, not just statistical significance, should determine the order in which variables (predictors) are entered into the model (Cohen & Cohen, 1983; de Jong, 1999; Tisak, 1994). In this study, the order of inclusion was based



on the degree to which practical interventions could be made. In the first step for instance, no interventions can be made in regards to individuals' military component or branch of service. In the next step, interventions could possibly be made to foster the personal variable of locus of control, but would require more invasive measure (e.g. counseling, changing military rank structure, altering individuals' responsibilities, etc.). In the final step, interventions could much more easily be implemented by providing access and encouragement to participate in leisure activities. Thus, in the final model, the variable with the most practical significance (increasing soldiers' access to leisure activities) was used to predict loneliness in the presence of variables that we have no control over (i.e. military service variables) and variables that are less easily altered (i.e. locus of control).

Although the survey evaluated 22 different types of leisure activities, it would not be feasible to enter all of these variables into a regression model with the limited amount of data obtained in this study. Most authors recommend that one should have at least 15 observations (cases, respondents) for each variable included in a hierarchical regression model (Hill & Lewicki, 2006). Therefore, with a sample size of 131 a subset of eight activities was pre-selected for inclusion in the hierarchical regression model. This selection was based on statistical considerations (correlating greater than .10 or less than -.10 (Pearson's  $r$ ) with loneliness scores) and conceptual considerations (the variables had to be clearly relevant to loneliness). Furthermore, to ensure that the variables selected were truly independent of one another, in cases where two activities were highly theoretically related to one another (such as writing letters and sending emails), only the variable that correlated (Pearson's  $r$ ) most strongly with loneliness was included. In

other words, if two activities were highly related to each other, to avoid redundancy in the model the activity with the higher correlation coefficient (Pearson's  $r$ ) was included. Finally, to minimize possible concerns related to range restriction (such as rarely occurring activities), preliminary analyses also confirmed adequate distribution of responses within all eight activities.

As seen in Table 7, the first step of the regression model included branch of service and military component. Although this first step reached statistical significance, these two variables only accounted for 7% of the total variance in loneliness scores. The second step added internal and external locus of control and accounted for 23% of the total variance (with the change in  $R^2$  being statistically significant). The final step in the model added the eight pre-selected activities and accounted for 41% of variance (with the change in  $R^2$  being statistically significant). Beta weights in this final step indicated that external locus of control ( $\beta = .43, P < .001$ ) positively predicts loneliness and listening to music ( $\beta = -.24, P < .01$ ) and emailing friends ( $\beta = -.34, P < .001$ ) negatively predicts loneliness. The apparent effectiveness of such activities in negatively predicting loneliness and the positive association of external locus of control with loneliness are in accordance with hypotheses 1 and 2 respectively.

### Discussion

Loneliness is certainly not unique to military personnel, but research suggests that individuals serving overseas in combat zones are exposed to a number of factors associated with increased loneliness. Despite exposure to many of the same stressors (e.g. being separated from home, enduring limited communication with family members or friends, the potential of insurgent attacks, etc.) troops report varied levels of

loneliness. One explanation for this is that some individuals may utilize more effective strategies and mechanisms to modify their environment or reduce internal distress. This investigation revealed the effectiveness of using certain coping mechanisms in dealing with loneliness and identified demographic characteristics associated with higher reported levels of loneliness.

The primary research question of this thesis was to predict loneliness by identifying specific leisurely activities that appear to be effective coping mechanisms. Of the 21 behavioral-cognitive coping mechanisms considered, when controlling for personal attributes, only listening to music and emailing friends remained significantly associated with loneliness. That is, listening to music and communicating with friends via email were negatively correlated with loneliness. Similar studies support these findings regarding the usefulness of such activities in coping with loneliness (Shaw & Gant, 2002; Shelar, 1991). One explanation of the effectiveness of such approaches as coping mechanisms may be the distractive quality of emailing and of music. When listening to a familiar song or emailing a friend, service members may be able to temporally ignore the stressfulness of their present circumstances and feel closer to where they would really like to be. Other activities with similar qualities such as television and movies, however, were less effective. A probable explanation for such findings may have to do with access and user-friendliness. Music can be downloaded from the internet or from cell phones, purchased from any military commissary, or received almost anywhere in the Middle East on Armed Forces Radio. Music devices such as I-pods or walkmans could easily be carried by soldiers into any condition. Furthermore, unlike

watching a movie, individuals could possibly listen to music while conducting many of their work-related activities.

Emailing has a social supportive component, as it may be used directly to support and maintain relationships. This social quality of email is supported by the fact that no other internet activities (i.e. shopping, recreation, etc.) were correlated with loneliness. Contacting friends, therefore, not just using the internet is what aided individuals in coping with loneliness. Interestingly though, a clear distinction emerged between emailing friends and emailing family members. A possible explanation for why emailing family was not significant may have to do with the age and marital status of people who most often utilized electronic mail. While youth was positively correlated with email usage, young people were less likely to be married. Those most often using email, therefore, would have been writing to friends (e.g. girlfriends, boyfriends, etc.) in the absence of spouses and children.

These findings regarding the use of music and email as coping mechanism to attenuate the effects of loneliness have very practical and significant implications. The most obvious conclusion would be to increase access to and encourage the use of these kinds of activities among military personnel deployed overseas. As mentioned above, Armed Forces Radio does an excellent job of providing music and entertainment to deployed troops. These services could be expanded, however, to include multiple radio stations designed to meet the diverse tastes of military personnel (e.g. country music, hip-hop, rap, etc.), while especially reaching out to older service members (e.g. classic rock, oldies, etc.). When preparing care packages or sending gifts, civilian agencies and loved ones could include compact-disks, MP3's, or certificates to download music from the

internet. Regarding the use of email, the military could always increase personal accesses to computers and the internet. This study, however, illustrates the additional need to increase the use of electronic mail among older service members. Efforts could be made to familiarize such members with the ease, security, and benefits of using email to maintain and support relationships.

In order to maximize the effectiveness of such behavioral-cognitive approaches in coping with loneliness, the personal coping styles of individuals must be considered as well. Locus of control, for instance, can be understood in terms of individuals' generalized expectancy regarding their perception of the causal relationships between behavior and outcome. In other words, the effectiveness of any coping behavior will be greatly determined by the degree to which the individual believes it will be effective (or not effective). The findings of this study are consistent with the literature that suggests internal locus of control is negatively correlated with loneliness, while external locus of control is positively associated (Solomon, 1990). Furthermore, this study demonstrates the unique findings that individuals with an internal locus of control have higher rank and that those with an external locus of control have served longer on their deployment and have longer tours of duty.

The effect of rank may be understood in terms of increased control and responsibility. Individuals with higher rank literally have more control over their circumstance while lower ranking individuals are controlled by those with more authority. Furthermore, with rank comes the responsibility of making choices. Research suggests that the ability to make choices can aid in coping with stress and anxiety by providing a sense of control over outcome (Kobasa, Maddi, Puccetti, & Zola, 1985). The

correlation between length of time deployed and external locus of control may be explained in terms of the nature of stressors. The effects of stressors (e.g. serving on a deployment) on mental health outcomes are shown to be a factor of length and ambiguity. The longer one has served overseas (i.e. length of stressor) and the farther away the end of the tour is (i.e. ambiguity of stressor) the less a person would feel in control.

Such findings regarding the relationship between locus of control and loneliness have very practical implications. The overall objective in this instance would obviously be to increase service members' sense of control while on deployments. Although it would not be practical to promote everyone in order to support internal loci of control, certain characteristics often associated with higher rank could realistically be fostered among lower ranking individuals. For instance, except in certain crucial job tasks, supervisors could allow lower ranking individuals more autonomy over how to complete their assignments. In other words, unless absolutely necessary, micro-managing could be avoided in an effort to allow lower ranking individuals to practice control over non-critical tasks. Regarding length of time served and TDY length, those with authority to effect change could shorten the total length of deployments. If such changes are not implemented, supervisors and mental health specialists could at least be proactively aware that time deployed and lengths of tour are positively associated with feelings of less control.

This sense of awareness of certain individual characteristics is also important in regards to increased likelihood of loneliness. Initial findings from this study suggest that age, length of tour, branch, component, and TDY location were all correlated with loneliness. Specifically, individuals who were older, had longer tours, were in the Army,

served in the Guard or Reserve, and were deployed to Afghanistan reported greater loneliness. Research suggests that increased age may be associated with loneliness due to a decline in energy levels, enthusiasm for new experiences, and youthfulness (Rokach, 2005). As previously mentioned, age may also be associated with loneliness due to less frequent use of effective coping mechanisms involving activities such as e-mail and music. Additionally, it is reasonable to assume that older service members may have left more established lives (e.g. career, family, community, etc.) and therefore may have more to miss and become lonely about.

A possible explanation for the correlation between military component (i.e. Active Duty versus Guard or Reserve) and loneliness may concern training and lifestyle. Members on active service are full-time soldiers and airmen. They wear their uniforms at least 5 days a week, live on or near military installations with their families, and constantly train for the possibility of deploying overseas. Most members of the Guard and Reserve, however, lead predominantly civilian lifestyles. Their training and experience with the military is rarely ever more than one weekend a month. As such, the transition for these “weekend warriors” from civilian life to serving in a combat zone may be more drastic than for individuals already serving full time in the military. Such findings suggest that members of the Guard and Reserve could benefit from short periods of active duty service in the United States prior to deployment in an effort to help ease their transition from civilian to military life. Furthermore, military supervisors should be sensitive to the fact that reserve component members must endure additional stressors on top of those experienced by everyone who is deployed overseas to a combat zone.

The individual characteristics of branch of service, TDY location, and length of tour overlapped somewhat and may all be understood in terms of deployment environment. For example, 85% of personnel serving in Qatar were members of the Air Force, while 83% serving in Afghanistan and 93% serving in Iraq were in the Army. Although Qatar, Iraq, and Afghanistan are all considered combat zones in the War on Terror, certain characteristics associated with increased loneliness (e.g. ambiguity, chance of enemy attack, etc.) are probably greater in Iraq and Afghanistan and therefore may account for the increased loneliness of service members deployed there. Furthermore, individuals stationed in Afghanistan and Iraq served significantly longer tours than those serving in Qatar. As previously mentioned, the longer one serves and the farther away the end of their tour is the more likely they are to feel out of control and therefore lonely. The best solution would be to decrease the length of tour of service members stationed in more hostile countries. If such changes are not possible, supervisors should at least be proactively aware that individuals serving longer tours are at an increased risk for loneliness.

The generalizability of the findings and recommendations of this study is enhanced by the distribution of characteristics of participants as well as the representative nature of the sample (see previous *Procedures* section for discussion of the representative nature of the sample). Based on data from the Defense Manpower Data Center, the distribution of age, race, rank, and religion in this study are approximately equal to that of the overall military (Maxfield, 2006). Discrepancies are minimal. For instance, females are slightly overrepresented in this sample as they comprise 33.6% of the sample but only 20% of the entire military. Additionally, while only 38.9% of the sample is married,



close to 50% of all military personnel have a spouse. Regarding location of deployment, while Iraq, Afghanistan, Qatar, and Kuwait are all considered combat zones in the War on Terror, the sample is comprised of almost equal numbers of troops serving in countries with more direct combat roles (i.e. Iraq and Afghanistan) and more supportive combat roles (i.e. Qatar and Kuwait). This allows for greater generalizability among all troops deployed to the Middle East regardless of TDY location.

When considering these and other recommendations based on the findings of this study, several limitations ought to be considered such as sample size and the lower alpha coefficient for the loneliness scale. Regarding sample size, only 131 service members accurately completed the survey. As a result, only a portion of the 21 activities of interest could be entered into the regression model. Based on the guideline that one needs 15 observations for each variable entered into a regression model, a sample size of at least 315 would have been required to include all 21 activities (Hill & Lewicki, 2006). Regarding internal consistency for the loneliness scale, the alpha coefficient was only .50. While a subsequent factor analysis indicated that all items loaded on the first factor above .479 and could therefore reasonably be combined to form a single scale of loneliness as originally intended, conclusions should be viewed in light of this limitation. The overall internal consistency for the scale measuring external locus of control and internal locus of control were higher, at .77(alpha) and .63(alpha) respectively.

Another limitation of the present study includes the restrictions placed on the researcher by military regulations. More specifically, when considering the conclusion that email usage and listening to music are the best predictors of loneliness, one should recognize that military regulations prevented the researcher from including other

activities that, in the opinion of the author, may have been significant predictors.

According to the Human Subjects Research Review Board Policies and Procedure guidelines, surveys cannot include items that inquire about participation in criminal activities (Department of Defense, 2002). As such, the present study did not include questions regarding the use of alcohol or pornography despite interest in investigating the effectiveness of such activities as coping mechanisms.

In addition to improving upon the aforementioned limitations of this study, future health psychology research conducted in a military setting should also continue the overall objective of this study: to expand the number of constructs investigated in military research, which in the opinion of this author, have been too narrowly defined until recently. Historically, the vast majority of studies on deployment stressors have focused on exposure to combat events and explained outcome in terms of posttraumatic stress disorder. By utilizing the Soldier Adaptation Model, future studies could investigate the relationships among any number of uninvestigated stressors, moderators, and outcomes in the unique setting of the combat zone. Such research would further our understanding of various psychological constructs. More importantly, such research could be of real service to military personnel and their families, whose lives are devoted to, characterized by, and often scarred by their service to others.

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Table 1

## Characteristics of Soldiers, Airmen, and Marines

Characteristics	Frequency	Percentage
<b>Gender</b>		
Men	87	66.4
Women	44	33.6
<b>Age, y</b>		
18-24	49	38.3
25-29	29	22.7
30-39	22	17.2
≥ 40	28	21.9
Mean (SD)	30.57 (10.4)	
<b>Marital Status</b>		
Married	51	38.9
Single	61	46.6
Divorced	6	4.6
<b>Branch of Service</b>		
Army	98	74.8
Air Force	31	23.7
Marines Corps	2	1.5
<b>Component</b>		
Active	89	67.9
National Guard	30	22.9
Reserve	6	4.6
<b>Grade</b>		
Enlisted 1-4	49	38.6
Enlisted 5-6	49	38.6
Enlisted 7-9	12	9.5
Officer	17	13.4
<b>Race</b>		
Caucasian	83	63.4
African American	28	21.4
Hispanic	16	12.2
Other	2	1.6

Table 1 continued

## Characteristics of Soldiers, Airmen, and Marines

Characteristics	Frequency	Percentage
<b>Religion</b>		
Protestant	30	22.9
Catholic	23	17.6
Nondenominational Christian	24	18.3
None	54	41.2
<b>TDY Location</b>		
Afghanistan	54	41.2
Qatar	31	23.7
Kuwait	30	22.9
Iraq	14	10.9
<b>Time Deployed, days</b>		
21-120	44	33.6
121-270	71	54.2
271-365	14	10.7
> 365	2	1.5
Mean (SD)	175 (105.6)	
<b>TDY Length, days</b>		
120	31	24.0
180	9	6.9
365	69	53.5
≥ 365	20	15.5
Mean (SD)	331 (156.1)	

Table 2

Correlation Between Reported Participation in Various Activities and Loneliness, External Locus of Control, and Internal Locus of Control

Activities	Loneliness	External LOC	Internal LOC
Listening to music	-.373**	-.156	.216*
Reading books or magazines	-.157	-.078	.207*
Singing or rapping	-.049	-.235*	.058
Seeking solitude or being alone	.129	-.109	-.057
Hanging out with friends	-.256*	-.111	.083
Snacking or eating (not including regular meals)	.042	.182*	-.285
Going to a club, bar, or lounge	.092	.056	-.050
Sleeping or napping (not including regular sleep time)	.104	.355**	-.034
Physical activity or exercise	-.067	-.044	-.115
Purchasing items or buying things	-.119	.055	-.083
Attending religious services	.006	-.030	.123
Praying	-.204*	-.119	.054
Watching TV or movies	-.041	.191*	-.159
Calling family members	-.165	-.003	-.123
Emailing family members	-.230*	-.249*	-.081
Calling friends	-.029	.033	-.106
Emailing friends	-.311**	.117	-.194*
Writing or sending letters	.089	.154	-.108
Receiving letters or packages	.021	-.026	-.047
Using the internet for recreation	-.043	.090	.007
Going off base	-.021	-.078	.019

Note.

\*Statistically significant at alpha=.05

\*\*Statistically significant at alpha=.01



Table 3

Correlations between Loneliness, External Locus of Control, Internal Locus of Control, and Continuous Variables

	External LOC	Internal LOC	Loneliness
Loneliness	.479**	-.306**	1
Internal LOC	-.349**	1	X
External LOC	1	X	X
Age	.114	-.041	.208*
Time Deployed	.213*	-.175	.196*
TDY Length	.329**	-.134	.248**
Rank Cont.	.064	.253**	.003

*Note.*

\*Statistically significant at alpha=.05

\*\*Statistically significant at alpha=.01

Table 4

Group Means and Standard Deviations and Between Group Differences (ANOVA)  
Across Loneliness

Category	M	SD	F	P
<b>Race</b>			.3	.77
Caucasian	13.6	3.2		
African American	14.0	3.0		
Hispanic	13.3	3.8		
<b>TDY Location</b>			3.0	.03
Afghanistan	14.3	2.8		
Qatar	12.3	3.0		
Kuwait	14.1	3.7		
Iraq	13.2	3.9		
<b>Branch</b>			8.8	.00
Army	14.2	3.1		
Air Force	12.3	3.0		
<b>Component</b>			3.6	.03
Active	13.3	3.2		
Guard	15.2	2.8		
Reserve	13.2	3.8		
<b>Rank Category</b>			.5	.72
Junior Enlisted (E1-E4)	14.0	2.6		
Junior NCO (E5-E6)	13.6	3.3		
Senior NCO (E7-E9)	14.6	4.1		
Commissioned Officers	13.2	3.6		
<b>Marital Status</b>			.5	.61
Married	13.5	3.1		
Single	14.2	3.1		
Divorced	14.0	5.5		

*Note.*

Degrees of freedom varied from 100 to 121 due to missing data within variables.

Table 5

Group Means and Standard Deviations and Between Group Differences (ANOVA)  
Across External Locus of Control

Category	M	SD	F	P
<b>Race</b>			1.8	.18
Caucasian	33.5	7.7		
African American	31.6	7.6		
Hispanic	36.1	6.4		
<b>TDY Location</b>			4.0	.00
Afghanistan	32.5	8.1		
Qatar	37.6	4.3		
Kuwait	32.1	8.0		
Iraq	31.1	8.7		
<b>Branch</b>			13.1	.00
Army	32.0	7.9		
Air Force	37.6	4.3		
<b>Component</b>			2.6	.08
Active	34.3	7.8		
Guard	31.4	7.3		
Reserve	28.8	7.0		
<b>Rank Category</b>			.6	.56
Junior Enlisted (E1-E4)	33.2	8.0		
Junior NCO (E5-E6)	34.3	6.9		
Senior NCO (E7-E9)	31.9	7.6		
Commissioned Officers	31.6	7.2		
<b>Marital Status</b>			.9	.43
Married	33.8	7.5		
Single	32.7	8.0		
Divorced	33.4	7.7		

*Note.*

Degrees of freedom varied from 100 to 121 due to missing data within variables.

Table 6

Group Means and Standard Deviations and Between Group Differences (ANOVA)  
Across Internal Locus of Control

Category	M	SD	F	P
<b>Race</b>			.1	.95
Caucasian	37.2	7.1		
African American	36.9	6.4		
Hispanic	36.7	6.5		
<b>TDY Location</b>			.6	.60
Afghanistan	36.5	7.2		
Qatar	37.7	5.8		
Kuwait	37.2	8.6		
Iraq	34.5	6.0		
<b>Branch</b>			.6	.46
Army	36.5	7.4		
Air Force	37.7	5.8		
<b>Component</b>			.5	.63
Active	34.3	7.8		
Guard	31.4	7.3		
Reserve	28.8	7.0		
<b>Rank Category</b>			3.0	.03
Junior Enlisted (E1-E4)	35.9	8.5		
Junior NCO (E5-E6)	36.0	5.2		
Senior NCO (E7-E9)	37.7	5.8		
Commissioned Officers	37.0	7.0		
<b>Marital Status</b>			.1	.88
Married	36.3	6.9		
Single	36.9	7.8		
Divorced	35.5	2.4		

*Note.*

Degrees of freedom varied from 100 to 121 due to missing data within variables.

Table 7

## Three-Step Regression Analysis Predicting Loneliness

	$\beta$	t	P	R <sup>2</sup>	$\Delta R^2$	p
<u>Step 1</u>				<u>.07</u>	<u>.07</u>	<u>.004</u>
Component	.17	1.9	.06			
Branch	-.21	-2.4	.02			
<u>Step 2</u>				<u>.23</u>	<u>.17</u>	<u>.0001</u>
Component	.10	1.3	.21			
Branch	-.10	-1.3	.21			
Intern. LOC	-.13	-1.6	.11			
Extern. LOC	-.37	-4.3	<.001			
<u>Step 3</u>				<u>.41</u>	<u>.21</u>	<u>.0001</u>
Component	.14	1.8	.07			
Branch	-.08	-1.0	.31			
Intern. LOC	-.10	-1.3	.19			
Extern. LOC	.43	5.2	<.001			
Listen to music	-.24	-2.9	.005			
Read	-.05	-.68	.50			
Seek solitude	.15	1.9	.06			
Be with friends	-.02	-.25	.81			
Nap	-.06	-.73	.47			
Pray	.03	.40	.69			
Email family	.06	.74	.46			
Email friends	-.34	-3.8	<.001			

## Appendix A.

## Questionnaire

Please CIRCLE the response that best describes how true each of the following statements are for you NOW.						
	Never 1	Rarely 2	Sometimes 3	Always 4		
(1) How often do you feel that you lack companionship?	1	2	3	4		
(2) How often do you feel that there is no one you can turn to?	1	2	3	4		
(3) How often do you feel outgoing and friendly?	1	2	3	4		
(4) How often do you feel left out?	1	2	3	4		
(5) How often do you feel isolated from others?	1	2	3	4		
(6) How often do you feel you can find companionship when you want it?	1	2	3	4		
(7) How often do you feel shy?	1	2	3	4		
(8) How often do you feel that people are around you but not with you?	1	2	3	4		
<b>Please CIRCLE how much you agree or disagree with the following statements on this 6-point scale:</b>						
	Agree			Disagree		
(1) When I am frightened by something, there is generally nothing I can do.	1	2	3	4	5	6
(2) There is little I can do to influence people's judgments of me.	1	2	3	4	5	6
(3) Whether I can successfully escape a frightening situation is always a matter of chance with me.	1	2	3	4	5	6
(4) I can usually influence the degree to which a situation is potentially threatening to me.	1	2	3	4	5	6
(5) There is little I can do to change frightening events.	1	2	3	4	5	6
(6) The extent to which a difficult situation resolves itself has nothing to do with my actions.	1	2	3	4	5	6
(7) If something is going to hurt me, it will happen no matter what I do.	1	2	3	4	5	6
(8) Most events that make me anxious are outside of my control.	1	2	3	4	5	6
(9) What people think of me is largely outside my control.	1	2	3	4	5	6
(10) When I am put under stress, I am likely to lose control.	1	2	3	4	5	6
(11) I can usually stop my anxiety from showing.	1	2	3	4	5	6
(12) I can usually put worrisome thoughts out of my mind easily.	1	2	3	4	5	6
(13) When I am in a stressful situation, I am able to stop myself from breathing too hard.	1	2	3	4	5	6
(14) I am able to control my level of anxiety.	1	2	3	4	5	6
(15) I can usually relax when I want.	1	2	3	4	5	6
(16) When I am under stress, I am not always sure how I will react.	1	2	3	4	5	6
(17) I always know exactly how I will react to difficult situations.	1	2	3	4	5	6
(18) When I am anxious, I find it difficult to focus on anything other than my anxiety.	1	2	3	4	5	6

Please continue on the other side.

Please CIRCLE the response that best describes how often (on average) you participate in the following activities right now during your current overseas tour.							
	Never	Weekly		Daily		Hourly	
	1	2	3	4	5	6	7
(1) Listening to music							
(2) Reading books or magazines		1	2	3	4	5	6 7
(3) Singing/Rapping		1	2	3	4	5	6 7
(4) Seeking solitude (being alone)		1	2	3	4	5	6 7
(5) Hanging out with friends		1	2	3	4	5	6 7
(6) Snacking/Eating (not including regular meals at the Dining Facility)		1	2	3	4	5	6 7
(7) Going to a Club/Bar/Lounge		1	2	3	4	5	6 7
(8) Sleeping/Napping (not including scheduled sleep hours)		1	2	3	4	5	6 7
(9) Physical Activity/Exercise		1	2	3	4	5	6 7
(10) Purchasing items/Buying things		1	2	3	4	5	6 7
(11) Attending religious services		1	2	3	4	5	6 7
(12) Praying		1	2	3	4	5	6 7
(13) Watching TV or movies		1	2	3	4	5	6 7
(14) Calling family members		1	2	3	4	5	6 7
(15) Emailing family members		1	2	3	4	5	6 7
(16) Calling friends		1	2	3	4	5	6 7
(17) Emailing friends		1	2	3	4	5	6 7
(18) Writing/Sending letters or packages		1	2	3	4	5	6 7
(19) Receiving letters or packages		1	2	3	4	5	6 7
(20) Using the internet for recreational purposes		1	2	3	4	5	6 7
(21) Going Off-Base		1	2	3	4	5	6 7
<b>Please list any other leisure activities you regularly participate in</b>							
(22) _____		1	2	3	4	5	6 7
(23) _____		1	2	3	4	5	6 7
Gender: F <input type="checkbox"/> M <input type="checkbox"/> Age: _____ Rank/Grade: _____ Racial/Ethnic identification: _____							
Religious/spiritual identification: _____ Branch of Service: Air Force, Army, Marine, Navy, foreign							
Component: Active, National Guard, Reserve (please circle one) What country will you be stationed in? _____							
How long have you been deployed? _____ Marital Status: Single, Married, Divorced, Engaged, Other							
What is the length of your assignment? (example: 120 days)							