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AN EVALUATION OF STRESS FACTORS IN BASIC  
ENLISTED SUBMARINE SCHOOL STUDENTS

History, Philosophy, and Practice of Adult Education

James C. Duncan  
Naval Submarine School

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A Practicum Report presented to Nova University in  
partial fulfillment of the requirements for the  
degree of Doctor of Education

Nova University  
July, 1993

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University in Partial Fulfillment for the  
Requirements for the Degree of Doctor  
of Education

AN EVALUATION OF STRESS FACTORS IN BASIC  
ENLISTED SUBMARINE SCHOOL STUDENTS

By

James C. Duncan

July, 1993

The purpose of this practicum was to evaluate the stress level and stressors affecting students attending Basic Enlisted Submarine School (BESS) in Groton, Connecticut. BESS is the initial training school for the majority of the enlisted students entering submarine service. This pilot study was undertaken at the request of the BESS director and staff because they felt stress may be affecting the academic performance of many of the students.

The Stressors That Impact Human Health Receptivity-Rating Scale was used to collect data from 23 BESS students regarding their stress level and stressors which may be affecting their academic performance. The results from the data gathered indicated that all of the respondents were found in the low or middle stress levels. The majority of the stressors affecting the

students were those associated with normal military life and adjustments to new situations.

The conclusions indicated that there are stressors affecting students attending BESS. While the levels of stress may be low, the results of this research indicate that BESS students do experience stress. The stressors tend to reflect the changes associated with military training and education.

Recommendation included training in the nature, caused, and effects of stress to both BESS staff and students. It was also recommended that a larger study on stress in BESS be conducted to determine the long term effects of stress on both staff and students.

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## DISCLAIMER

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This research report is submitted as part of a degree program of Nova University and the opinions and conclusions are solely the authors and do not reflect official policy of the Departments of Defense or of the Navy. Information in this report may not be used without permission of the author.

## Chapter 1

### INTRODUCTION

#### Background and Significance

Basic Enlisted Submarine School (BESS) is the initial training command for enlisted sailors entering the submarine force of the United States Navy. BESS is one of five teaching departments of Naval Submarine School located in Groton, CT. The purpose and mission of BESS is to train "...enlisted personnel in the basic knowledge and skills upon which operational submarine commands in the Atlantic and Pacific submarine forces can build competence and proficiency in operating and maintaining submarines and all their systems...." (Chief of Naval Technical Training Instruction 5450.51C, p. 1). To achieve this purpose, the school trains approximately 2000 students annually with about 200 students enrolled at any given time.

The BESS curriculum contains an introduction to the history of the submarine, a brief overview of the submarine in current military policy, submarine survival skills, and intense training in the technology, mechanics, and electronics of submarines. The goal of this training is to produce a "fleet ready" sailor for the submarine force. One officer and 35 enlisted personnel conduct this training over a 5 week course of instruction.

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Sailors attending BESS are all volunteers and have met rigorous physical, psychological, and educational requirements. Before a sailor can submit an application for acceptance to submarine duty, a medical officer must indicate that the applicant has met the physical standards required for undersea duty. Upon arrival at BESS each prospective student is given a psychological test to determine if they meet the emotional requirements for duty in submarines. The intellectual and educational levels required for submarine duty places the BESS student in the top five percent of all enlisted sailors in the Navy.

An analysis of student records indicated that 90% of all students are in their first enlistment in the Navy and are under 21 years old. The majority of those serving in their second or subsequent enlistments and older students are Hospital Corpsman. These students have additional rank and experience requirements before they are admitted to BESS. All the students are high school graduates and a majority have at least one year of college or technical/vocational education. College graduates and sailors with graduates degrees are not uncommon. Eighty percent of the students are European-Americans. The student population also includes African-Americans, Asian-American, Hispanics, and Native Americans. The student population is all male (BESS

Department Director, personal communication, 20 April 1993).

In January 1993 the BESS instructors developed concerns regarding an increase in academic and behavioral problems among BESS students. It was commonly believed by many of these instructors that most of these problems were caused by increased stress levels among the students. However, other than anecdotal inferences the instructors had no objective data to indicate if their beliefs about students stress were accurate. The BESS director asked the chaplains of the Religious Ministries Department (RMD) to evaluate the instructors beliefs regarding students stress levels.

The purpose of this study was to evaluate the instructors beliefs regarding stress levels among BESS students. With the information gained through this evaluative study, it is believed by the chaplains and the BESS staff that the educational process will be enhanced in an increased ability of Naval educators to make informed decisions regarding student personnel. This will assist the staff in developing programs to reduce student stress levels and in moderating those stressors which may be affecting behavior and academic performance in BESS students.

This practicum is clearly related to the educational foundations examined in the History, Phi-

losophy, and Practice of Adult Education seminar. Humanistic educational philosophers believe that one of the goals of education is to assist people in becoming fully functioning individuals (Elias & Merrian, 1984). Clinebell (1992) has developed a humanistic, holistic philosophy of education and human growth. In his research he finds that stress prevents adults from achieving their full learning potential and growth. Other research (Draves, 1984; Lawler, 1991) has indicated that adults must be emotionally comfortable with their learning environment in order for them to gain maximum benefit from their educational experience.

#### Research Questions

There are two research questions for this evaluation study. The first research questions is: What is the average level of stress among the students sampled in this study? The second research question is: Within the limits of the survey instrument, what are the major life events causing stress with those BESS students surveyed?

## Chapter 2

### REVIEW OF THE LITERATURE

#### Introduction

A literature review was conducted to determine the nature, causes, and effects of stress. This search was conducted through ERIC and also included a review of pertinent literature and resources in the Naval Hospital Groton, Naval Submarine Medical Research Command, and the Submarine Base New London Mental Health Department libraries. Dr. Howard Clinebell provided further resources in the area of stress as an issue in developing a humanistic philosophy of Christian education. This review of literature will be limited to published, unclassified studies regarding the mental health and stress levels of submarine personnel.

This review of literature will be organized around three major topics with a concluding section. The first topic will define stress as a concern in humanistic religious education. The second topic will define stress and outline its effects on humans. The third topic will outline stressors affecting submarine personnel.

#### Philosophies of Humanistic Religious Education

Humanistic adult education is a broad philosophical position which promotes the dignity and autonomy of all humans. The main goal of humanistic education is to

promote individual growth and development. The curriculum emphasizes those learning experiences which promote human growth and development. Students center on those learning activities which focus on the learning process and group interaction (Elias and Merriam, 1984; Lawler, 1991).

Traditionally, religious education has been at odds with humanistic educational philosophy. However, recently many religious education theorists have united the insights of theology and the human potentials movement to develop religious education curriculum which attempts to teach religious doctrine and develop human potential and self-actualization.

Some of the leaders of the movement to unite religious doctrine with the human potentials movement are Clinebell (1972) and Menconi, Peace, and Coleman (1989a & 1989b). They state that the goal of humanistic religious education (HRE) and pastoral counseling is the enabling of adults to facilitate the maximum development of their potentials. They believe that the bases of all human growth and development is spiritual and that the foundation for this growth can be found in the Judeo-Christian tradition. Clinebell (1992) believes that the insights of St. Paul regarding that humans are children of God and the creation account found in Genesis provide the philosophical foundation for HRE. These

traditions indicate that all humans are created in the image of God and therefore have worth, dignity, autonomy, and possess great potential for self-actualization.

Other researchers (Menconi, Peach, & Coleman, 1989a & 1989b) believe that the ministry of Jesus focused on helping persons overcome those obstacles which prevent people from finding God. Minirth, Meier, Hawkins, Thurman, and Flournoy (1992) believe that the Christian religion address the psychosocial issues which inhibit personal growth and may prevent persons from achieving self-actualization through their religious experience.

The goal of HRE is the development of personality through providing positive religious experiences. Clinebell (1992) understands human personality to be "...dynamic, developing, changing stream, not a fixed quantity to be uncovered" (P. 39). He believes that people grow toward self-actualization when change occurs in the six interdependent areas which directly affect the development of personality. These areas are the mind, the body, in relationship with others, in relationship with the biosphere, in relationship with groups and institutions, and the spiritual life (Clinebell, 1992). These six dimensions are interdependent facets and growth, or lack of growth, in any facet leads to changes in the other five areas and a change in personality.



Positive religious experiences, salugenic religion, is a major factor in all human growth. Salugenic religion enables individuals to integrate their growth in developing a viable philosophy of life. A viable belief system helps provide a foundation of meaning and purpose for the individual. Clinebell (1979) states that the "...conviction of one's existence has a purpose, in spite of the inevitable tragedies of life [and] equips one to life more fully in the midst of those tragedies" (P. 116). This philosophy of life enables one to interpret change and decide how to apply that growth or change to his or her life.

Salugenic religion within the HRE curriculum enables persons to develop creative values. Many of the researcher-practitioners of HRE (Menconi et al., 1989a and 1989b; Clinebell, 1992) base their educational theory on the research of Abraham Maslow, that humans have a need for the values of truth, goodness, beauty, wholeness, justice, playfulness, meaningfulness, etc. These values enable individuals avoid illness and achieve their full potential. Lack of these creative values in human life can engender anomie, alienation, axiological depression, meaningless, loss of zest for life, hopelessness, and boredom.

When humans experience negative stress their potential for growth is diminished. Negative stressors can inhibit

thinking, destroy the body, alter relationships with people, things, groups, and God (Menconi et al., 1989b; Clinebell, 1992). Negative stress then prevents humans from achieving their potential and prevents growth which leads to their self-actualization. Stress also affects the way one views his or her religious beliefs, which prevents the person from developing perspective on her or his life and stressors affecting him or her.

Other researchers (Brown, 1983; Tubesing, 1981; Minirth, Hawkins, Meier, & Flournoy, 1986) have made contributions to the development of HRE. These researchers, while not writing from the HRE perspective, support the recent attempts to enable people to use their religious beliefs to understand and deal with stress. They find that positive religious values help persons moderate their stress levels, develop perspective on their problems, and use their faith to develop positive expectations during times of change or personal crisis.

The research reviewed indicates that stress is a concern in the development of HRE curriculum and programs. The philosophical goal of HRE is the development of humans through providing experiences uniting positive religious beliefs with the development of human self-actualization strategies. A person in a stressful situation may lose the ability to make sound judgements

regarding their life situation which can effect their progress toward God and their personal self-actualization. Educational experiences which would help persons develop their understanding of stress, its effects, and possible methods of reducing stress could be incorporated into programs on spiritual growth and development.

#### Definition and Effects of Stress

Stress, and stress related problems, is, and has been, a topic of research interest during the past 25 years. However, there is a lack of agreement on a definition of stress. The most general definition of stress is that it is the humans's body response to the demands made on it (Selye, 1974). The attempt to define stress is further complicated because each person may respond to a stress producing event differently. Also, a person may react to the same event differently at various stages of the life-cycle. Some researchers have reported that because of these factors, a better definition of stress is "the perception of a threat to one's physical or psychological well-being and the perception that one is unable to cope with that threat" (Stuart, Webster, & Wells-Federman, 1992, p. 180). Other researchers believe that change to life events are the major causes of stress in humans (Holmes and Rahe, 1967b).

Stress can be divided into two types: distress and eustress. Distress is the bodies response to actual or

perceived negative events. Eustress is the good, positive stress one feels at moments of fulfillment or satisfaction (Minirth, Meier, Hawkins, Thurman, & Flurnoy, 1992). Brown (1983) states that eustress was that stress which helped people develop their best qualities and therefore was desirable. Distress is stress which can produce both physical (muscle tension, pain, cancer, etc.) and/or psychological (anxiety, worry, etc.) symptoms (Simonton, Matthews-Simonton, & Creighton, 1988).

Cannon (1932), in his seminal study on stress, indicated that stress is closely connected to the fight-or-flight response. The fight-or-flight response the bodies' involuntary physiological change when confronted with a stressful or threatening situation. The purpose of this response is to prepare the body for a physical encounter (fight) or give extra, needed energy to run from a stressful or threatening situation. This response is controlled by the hypothalamus which, when confronted with a threat, causes the sympathetic nervous system to release epinephrine and norepinephrine and other hormones. These hormones cause the metabolism, heart rate, blood pressure, breathing rate and muscle tension to increase preparing the body to meet a threat (Hoblitzelle & Benson, 1992; Pelletier, 1977).

Stuart, Wesbter, and Wells-Federman (1993) find that the bodies reaction to the fight-or- flight response is responsible for many of physical, behavioral, emotional, and cognitive problems experienced by their patients and clients. Common physical manifestations of stress include headaches, indigestion, stomachaches, dizziness, restlessness, tiredness, and ringing in the ears. Behavioral symptoms of stress include excess smoking, bossiness, critical attitudes of self and others, compulsive eating, inability to get things done, etc. Emotional manifestations of stress can include crying, anxiety, boredom, edginess, powerlessness, feeling overwhelmed, anger, and loneliness. Some of the cognitive symptoms of stress include memory loss, trouble thinking clearly, forgetfulness, constant worry, and an inability to make decisions.

Rahe, Meyer, Smith, Kjaer, and Holmes (1964) and Holmes and Rahe (1967b) find that a group of social events requiring ongoing life adjustment/stress also causes the sympathetic nervous system to produce harmones to adjust to new lifestyles. These life adjustments may be both positive (marriage, promotion, outstanding personal achievement, etc.) or negative (death of a spouse, jail term, foreclosure on a mortgage or lone, etc.). In all cases the adjustments cause stress

reactions ranging from minor worry to major illness (Pelletier, 1976).

Holmes and Rahe (1967a) demonstrate that persons undergoing many life adjustments are prone to illness. In their research to determine how life adjustments affect human stress levels they developed a psychometric questionnaire to determine the amount of social change a person was experiencing. Their Social Readjustment Rating Scale has been validated (Holmes & Rahe, 1967b; Rahe, 1969; Rahe, 1973; Pelletier, 1976; Brown, 1983; Caudill-Slosberg & Friedman, 1992; Moyers, 1993) in predicting the possibility of illness of persons undergoing high degrees of change and social readjustment.

The Social Readjustment Rating Scale was developed using a double-bind experimental procedures to eliminate the possibility of error in predicting illness due to life events. Further, the events used in this scale are common to normal life and are limited to a certain period of time (Holmes & Rahe, 1967b). The underlying theory of this research is that the stress of adjusting to life events lowers bodily resistance and increases the chance of illness.

The Social Readjustment Rating Scale is designed to examine the life changing events in a person's life over a one year period. A person with a score of 150 points or higher would make one's chances of developing

an illness or health change approximately 50%. If an individual's life changing events produced a score of over 300 points changes of developing an illness increased to almost 90% (Holmes and Rahe, 1967b).

In one study, Rahe (1973) examine the stress levels of 2500 Naval officers and sailors on three vessels about to make a six month deployment. He found that the 30% of sailors with the highest life-change scores developed 90% of the reported illnesses during the first month of the cruise. Throughout the deployment, the high scoring group consistently had more illnesses than the lowest 30%.

Research indicated that stress is a major cause of disease and that stress is a problem in modern American life. The problems caused by stress affect how persons understand themselves, their health, and the world they live.

#### Stressors Affecting Submarine Personnel

The stressors affecting submariners, and those training to become submariners, can be divided into two major areas. The first area is those stressors common to military life. The second area is those stressors unique to submarine training and life. This section will review selected literature relating to stress in military life in general and to submariners life and training. Due to the security classification placed on

most psychological studies related to members of the "silent service," the literature reviewed will be limited to published, unclassified, and somewhat dated studies.

Researchers report that many of the job related stressors experienced by military members are the same as those in civilian occupations such as role conflict, ambiguity, work overload, and competition. However, military members experience additional stressors due to obligation or contractual agreements for service, frequent change of commanding officers, the military rank system, regimentation regarding courtesy and uniforms/dress, frequent moves, and prolonged absence from family and other support systems due to overseas assignments and ship deployments (Solis, 1991; Pokorski, 1992). True and Benway (1992) believe that the knowledge each military member understands she or he can be ordered into combat situations is an unspoken stressor unique to military life. Earhart (n.d.) reports that many young sailors do not have the coping skills needed to adjust to the changes required by military life which creates additional stress in stressful situations.

Researchers (Earhart, n.d.; Weybrew 1992) report that within the Navy it is commonly understood that assignment to submarines is one of the more, if not



the most, stressful duties an officer or sailor can undertake. In addition to the stressors common to military life, nuclear submariners also face other stressors. Weybrew (1992) found that submariners perceived stress in ten areas. In descending order these stressors are perceived danger of radiation and other atmospheric contaminantion, concern about seawater pressurization, space restriction, family separation, adverse effects of asynchrony of day-night cues upon sleep, excessive noise levels, work overload and underload, and environmental conditions tending to produce insomnia, boredom, and fatigue. Other research confirms these findings (Brantler, n.d.; Earhart, n.d.; Snyder, 1978; Weybrew & Noddin, 1979a and 1979b).

Earhart (n.d.) finds that submariners perception of stress was greater in comparison to the general population. He reports that submariners described stressors occurring in three areas of their lives. His subjects reports occupational stressors relating to the unique environmental factors of submarine life and related to sleep problems while deployed, atmospheric contaminantion, seawater pressuriation and confinement in submarines. He also reports that other occupational stressors included interpersonal conflicts and job dissatisfaction.

Earhart (n.d.) also reports a second areas of stressors affecting submarine personnel. Changes in life-style, frequent moves, marriage problems, newly married, major financial obligations, pregnancy of wife or girlfriend, birth of children, decisions to remain in the Navy or questions regarding Navy life, divorce, and parental problems were major life stressors of those submariners Earhart surveyed. His research indicates separation from family and the inability to solve personal problems while deployed are major stressors to submarine personnel.

Earhart (n.d.) finds that a third area contributing to stress among junior, less experienced, submarine sailors was their lack of coping skills. Their inability to find solutions to their problems contributed additional stress to already stressful situations. Brantley (n. d.) reports that this is a common problem among young military members in all branches of service and cannot be attributed only to submariners.

Literature relating to stress among sailors in training to become submariners was not found. E. M. Noddin (n.d.), a psychometrixian for BESS, reports that the majority of stress reported by students related to adjusting to military life, attempts to discover their "...personal place in life," redefining their relation-

ships with family and new friends, and academic problems. Most of the students have not considered the environmental stressors relating to submarine life reported by more experienced personnel.

Other studies (Biersner, 1987; Burr, & Palinkas, 1987; Dean, Scott, & Dembert, 1988; Weybrew and Molish, 1989) relating to the mental health of submariners report that stress is a way of life among submarine sailors. However, as a population the mental health of submariners is above average and that discharge rate of submarine personnel for psychological problems is the lowest in the Navy.

Each of the researchers use different research instruments in collecting data regarding stress relating to submarine personnel. Earhart (n.d.) uses the Global Assessment of Recent Stress Scale, the general health questionnaire, and personal interviews to collect his data. In their early studies Weybrew and Noddin (1979a and 1979b) uses the Minnesota Multiphasic Personality Inventory to gather their research data. The Subscreen Test was used by Brantley (n.d.) to determine why persons were disqualified from submarine duty. The most comprehensive use of research instruments and psychological test is used by Weybrew (1992) in his research. He uses the Personal Inventory Barometer, the Affective Response Inventory, the

Weybrew Activity Inventory, an Incomplete Sentence survey, the Submariner Frustration Test, the Submarine Tell-a- Story Test, the Submariner Stereotype Test, the Stubmariner Mirth Response Test, the Submariners Attitude Questionnaire, and the Stress Research Proposal Evaluation Form. Research reflecting the use of the Holmes-Rahe Social Readjustment Rate Scale was not found.

Research proves that stress among submarine personnel is high. This stress is engendered by environmental factors unique to submarine life, military life in general, and many of the younger sailors need to develop problems solving skills. However, the mental health of submarines is above average and as a group have the lowest discharge rate in the Navy for psychological problems.

#### Conclusion

The review of literature has examined three areas of research. The first area of research examined was the relationship between stress and adult humanistic religious education. The second area of research literature examined explored the definitions and nature of stress. The third area of literature examined was stress among submarine personnel.

Four major points emerged from this review of literature. From the literature reviewed it could be determined that stress is a concern for religious

educators teaching adults from a blending of religious insight with humanistic educational principles. A second determination from the literature reviewed is that stress affects a person's health, life-style, and world view. A third insight from the research reviewed is that submariners perceive that they are under a high degree of stress from stressors not normally encountered by other members of American society. A fourth point found from the literature reviewed there has not been a study conducted on submarine personnel using the Holmes-Rahe Social Readjustment Rating Scale.

## Chapter 3

## METHODOLOGY AND PROCEDURES

This evaluation study was conducted using the systems method of, or systems approach, to problem solving. The first phase of this approach, understanding the problem, provided the focus and limited the scope of this study. The second phase, developing a solution, provided a basis for selection of appropriate procedures and evaluation of the stress levels of BESS students. Since the purpose of this study was to make recommendations to the Director of BESS regarding the stress levels of BESS students, the third phase of the systems method, implementing solutions, was not involved. However, the information contained in the report to the BESS director would be used for program planning if a high degree of stress was found among BESS students.

This study began with an extended review of the literature in order to provide the conceptual framework for the research. Sources of literature included books, periodicals, and journals obtained from an ERIC search and the Naval Hospital Groton, Naval Submarine Medical Research Command, and the Submarine Base New London Mental Health Department libraries. Additional information was provided by mental health professionals with expertise in underwater medicine and psychopathology.

Upon completion of the review of literature, input was sought from the Director of BESS and the four instructors who believed that students were exhibiting high levels of stress. The purpose of gathering this input was to decide the exact question or problem the BESS staff was asking the researcher to answer or solve. Based upon these interviews, the researcher determined that the BESS staff wanted to know the level of stress experienced by BESS students. The second question the staff wanted to know was what were the major stressors affecting the students.

The information obtained from the review of literature and from the BESS staff members were incorporated into a non-experimental field survey research design. The purpose of this research design was to directly ask questions about the behaviors, attitudes, beliefs, and intentions of those surveyed. This design was deemed to be one of the most conducive to gather the data needed to assess BESS students stress levels.

Based on the questions the BESS staff wanted evaluated, it was determined that a Navy sponsored revised Holmes-Rahe Social Readjustment Rating Scale, the Stressors That Impact Human Health Receptivity-Rating Scale (STIHHR-RS), would be used. This scale was chosen because of its ease of administration and

scoring, its high content and construct validity, and its accurate assessment of stressors affecting Navy personnel. Permission had been previously obtained by the Religious Ministries Department from the developers of this survey to reproduce and administer this survey in pastoral counseling. Appendix A contains the permission letter from Church Growth 2000. Demographic questions were developed and tested for inclusion with the STIHHR-RS. Appendix B contains the survey instrument used for this evaluation study.

On March 1, 1993, pilot administration of the survey was conducted. The purpose of this pilot administration was to help the researcher anticipate questions or problems which may occur in the actual administration of the survey. The survey was administered in a group setting to 16 newly reported BESS students. From the student's feedback regarding the pilot survey, it was determined by the chaplains and the BESS instructors that the demographic questions, the questions on the STIHHR-RS and the administrative procedures were understandable by a majority of the students. It was determined by the BESS director to administer the STIHHR-RS to the next class.

On March 8, 1993, the survey was administered to 23 BESS students. The data was analyzed using descriptive methods. The focus of this data analysis was to



determine the range of the reported stress levels and median of the students stress levels. The data was also examined to determine the major stressors reported by those completing the survey. The information obtained from the survey was presented to the BESS director on June 28, 1993. Appendix C is the "talking paper" used during that brief.

#### Definition of Terms

Four definitions was deemed necessary for this research. Stress is defined as the body's physical and psychological response to real and perceived psycosocial change. Low stress is defined as scoring under 150 points on the STIHHR-RS. A middle stress level 151-300 points on the STIHH-RS. A high level of stress is any score above 301 on the STIHH-RS. The definitions of low, middle, and high stress were based on Brown's (1983) understanding of the Holms-Rahe scale. Church Growth 2000 concurred with these definitions for use with the STIHHR-RS (W. C. Arn, personal communication, November 2, 1992).

Five definitions was deemed necessary for the construction of the survey instrument used to gather data in this study. Rank refers to the position one holds within the military structure. Subfarer/striker refers to an enlistment program where a sailor is guaranteed orders to BESS and then assignment to a

submarine. Submarine Advanced Electronics Facilitation (SAEF) refers to an enlistment program where a sailor is guaranteed orders to BESS with additional advanced training in an occupational rating. Fleet returnee refers to a sailor who has completed one or more tours before receiving orders to BESS. "A" school graduate refers to those sailors who are not fleet returnees, but who have received their occupational training before arriving at BESS.

#### Assumptions

The following assumptions applied to this study. First, it was assumed that the STIHHR-RS would collect the data needed for this study. Second, it was assumed that the number of students surveyed would provide adequate input to form generalizations about the research questions. Thirdly, it was assumed that student stress and the factors contributing to stress can be isolated and measured. Fourthly, it was assumed the students completing the survey would answer the questions truthfully.

#### Limitations

There were four limitations of significance associated with this study. First, the findings of this would only reflect the population surveyed. Second, the students who completed the survey were Navy personnel, however, their frames of reference were not assumed to be universal. The third limitation was

that the study would be a pilot study. The fourth limitation was that only the STIHR-RS would be used to survey the students.

## Chapter 4

### RESULTS

#### Introduction

The purpose of this chapter is to present the data gathered in order to answer the research questions posed for this evaluation study. This chapter will contain the procedural components used to gather the data as well as the data itself.

#### Procedural Components

Upon being requested by the director of BESS to conduct a study of stress among BESS students, a comprehensive literature review was completed. The literature encompassed books, magazines, periodicals, and research thesis which addressed information on principles of humanistic religious education, the nature of stress, and stress in military life with an emphasis on stressors relating to submarine duty. Other information was gathered by interview a leading humanistic religious educator and a psychologist who has extensive work with submariners. The three subject areas provided the basis for the presentation of the literature review in Chapter Two and the conceptual framework for conducting an evaluative study of the levels of stress among BESS students.

The first section of the literature review had a twofold purpose. The first purpose was to determine

if a study on stress was a proper concern of the Religious Ministries Department or should a study of this nature be conducted by the Naval Hospital Groton's Mental Health Department. The second purpose of the first section was to develop the theoretical and philosophical foundation of stress as a subject for adult education.

Through the examination of the work of Howard Clinbell it was determined that stress is a concern for both adult and religious educators. He demonstrated that stress is a proper subject for humanistic religious educators due to the effects of stress inhibiting spiritual and religious growth. Because religious and spiritual growth is inhibited, individuals cannot reach their full potential. Therefore, if religious educators can help individuals understand and overcome their stress, they can enable spiritual growth to help persons on their quest for self-actualization.

Sections two and three of the literature review contained information that provided a basis for analyzing and defining stress in both the general and the military populations. The literature reviewed indicated that stress is a major problem in American society. Further, military personnel have many of the same stressors which their civilian counterparts experience. However, military life also has stressors

unique to the military environment. Submariners experience both the stressors of military life, but also stresses which are limited to the submarine community.

The review of literature also pointed out a lack of research on stress among submariners using social readjustment as the a research focus. The literature search did not produce any research where the Holmes-Rahe Social Readjustment Rating Scale was used as a research tool.

After the literature review was completed, formal and informal meetings were held with the BESS director, the lead instructor, and two of the instructors who believed that stress was a problem for BESS students. The purpose of this meetings was to determine the key elements for the study, the information required, and the reasons for this study. From these meetings it was determined by the senior chaplain for the Religious Ministries Department that the research would be beneficial for both BESS and the chaplains. The decision was based on the theoretical construct of humanistic religious education and the need of this information for pastoral counseling with BESS students. These meeting also provided the guidance which was used in the formulation of the two research questions used in this study.

Decisions limiting the scope of the study were also agree upon during these meetings. The first decision was that this study would be a pilot study. Only one class would have their stress levels evaluated. If further research was deemed necessary, a formal request would be made by the BESS director to the Naval Hospital's Mental Health Department for additional research. This decision was made due to the limited resources for research by the Religious Ministries Department and Navy policy regarding psychological research on military members and their families.

The second decision which limited the focus of this study was made regarding the research tool. The research instrument was limited to a revised Holmes-Rahe Social Readjustment Scale called the Stressors That Impact Human Health Receptivity-Rating Scale (STIHHR-RS). This scale was developed for the Navy by Church Growth 2000 and many of the items of the STIHHR-RS used Navy terminology in expressing stressors experienced by the general population. In the validation studies conducted by Church Growth 2000 there was a high correlation between the Social Readjustment Scale and the STIHHR-RS (W. C. Arn, personal communication, 2 November 1993).

Three other factors made it advantageous to use the STIHHR-RS. The first was that the Chaplains Department

was given permission to reproduce and administer the instrument by Church Growth 2000. The ease of tabulating and obtaining a level of stress was the second consideration which the chaplains and BESS staff found advantageous. The third reason for this test selection was that no other use of a scale of this type had been used with submariners.

Demographic questions were also developed. Those questions related to age, rate, enlistment program, years of education, and number of years on active duty were deemed appropriate. Questions related to race, martial status, Social Security number, and other personal data covered by the Privacy Act were not included.

Once the demographic questions were developed they were validated by a reading expert and five student of the expected age and educational level of the expected group to be surveyed. They were asked if they understood the questions and would have any trouble in answering them. The reading instructor and the students stated that they would have no difficulty in answering them. The demographic questions were then added to the STIHHR-RS.

The chaplains made the decision to administer the STIHHR-RS during their indoctrination lecture. This lecture is given by the chaplains on the first day of



each new BESS class. It covers such topics as the role of chaplains in BESS, religious services available to the students, and information on developing crisis coping skills. Permission was obtained from the BESS director for an additional 20 minutes of presentation time to administer the research tool.

Further, the senior Chaplain received permission to conduct a pilot study to determine if there were any problems or unanticipated questions in administering the STIHHR-RS. From the questions the students raised during this pilot study it was determined that more time was needed in explaining how the survey was to be completed. Also, that many items and terms used in the survey were familiar to more experienced sailors, but unfamiliar to newer sailors and therefore these items need to be explained in the introduction to the survey. The comments and questions from the pilot group were incorporated into the presentation and introduction to the survey. Information relating to the stress levels and types of stressors experienced by the pilot group were not analyzed or incorporated into this study.

The STIFFR-RS was administered to the next BESS class during the following weeks indoctrination. This class was chosen at random with no previous knowledge by the Religious Ministries Department of the class size

or composition. The survey was administered to 23 sailors and there were no problems encountered during the administration of the test. The students were told that the information gained in this survey would be used to develop stress reducing programs for future BESS classes. Each student was asked to mark the items which they had experienced during the past 12 months. Further, the students were told that if they wished not to complete the survey they were at liberty not to turn in their questionnaire. However, each of the students elected to complete and turn in their survey.

The data gathered from the students was then tabulated to determine a score on the amount of stress each student had experienced during the past year. From this data a range and average stress score was determined for the class. Then each of the items was evaluated and ranked to determine those items which most affected the students during the past year. This data was used to formulate the answers to the research questions.

#### Data

Twenty-three BESS student completed the questionnaire. Table 1 presents the demographic data of the respondents. All of the respondents were male and their ages ranged from 18 to 36 years old with a mean

of 23.1 years old. The student's time in Naval service ranged from 3 months to 15 years 8 months with a mean of 3.97 years of active duty. Those sailors with the rank of E-1 through E-3 made up the 52.1% of the respondents while those holding the rank of E-4 through E-6 made up 47.9% of those responding. Most of the respondents (65.2%) had completed "A" school before beginning BESS. Fleet returnees made up 21.7% of the class while subfarer/strickers made up 13.1%. The educational level of the respondents indicated that high school graduates made up 69.6% of those surveyed with those claiming some college (21.7) and those holding college undergraduate degrees (8.7%).

Table 2 presents the stress levels and the number in each stress category. The range of reported stress levels were 63-260 points with a mean of 152.08 points. Thirteen of the respondents (56.5%) had scores in the low stress category and ten respondents (43.5%) were in the middle stress category. There were no students who had scores in the high stress category.

The students reported that 29 of the 42 life events listed on the survey had occurred to them in the past 12 months. Only three items were listed by 50% or more of the students. These items were related to starting or completing schooling, the Christmas season, and vacations. Stressors relating to PCS orders,

Table 1

Demographic Data<sup>a</sup>

## Age

Range 18-36 years old

Mean 23.1

## Time in Service

Range 3 months - 15 years 8 months

Mean 3 years 11 months

## Rank

| <u>Rank</u> | <u>Number</u> | <u>Percentage</u> |
|-------------|---------------|-------------------|
| E-1         | 5             | 21.7              |
| E-2         | 2             | 8.7               |
| E-3         | 5             | 21.7              |
| E-4         | 2             | 8.7               |
| E-5         | 6             | 26.1              |
| E-6         | 3             | 13.1              |

## Enlisted Programs

| <u>Program</u>   | <u>Number</u> | <u>Percentage</u> |
|------------------|---------------|-------------------|
| Subfarer/striker | 3             | 13.1              |
| SAEF             | 0             | 0                 |
| Fleet returnee   | 5             | 21.7              |
| "A" Schools      | 15            | 65.2              |

## Education Completed

| <u>Education Level</u> | <u>Number</u> | <u>Percentage</u> |
|------------------------|---------------|-------------------|
| High School            | 16            | 69.6              |
| 1-3 years of Colllege  | 5             | 21.7              |
| College Degree         | 2             | 8.7               |
| Graduate Degree        | 0             | 0                 |

<sup>a</sup>N=23

Table 2

Levels of Stress Reported by BESS Students <sup>a</sup>

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Range of Stress

Range 63-260 points

Mean 152.1

## Levels of Stress

| <u>Category</u>     | <u>Number</u> | <u>Percentage</u> |
|---------------------|---------------|-------------------|
| Low stress level    | 13            | 56.6%             |
| Middle stress level | 10            | 43.4%             |
| High stress level   | 0             | 0                 |

<sup>a</sup>N=23

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changes in recreational habits, in work hours and conditions, and in living conditions were listed by eight to ten (35%-48%) of the BESS students. Only six (26%) reported that receiving a medal had been a life change. The majority of the stressors had four or less responses to each item. Table 3 presents the stressors by reported frequency.

Conclusion

The purpose of this chapter was to report procedural components and the results of an evaluative study on stress among BESS students. This information was used in making recommendations to the BESS director

Table 3

List of Stressors by Reported Frequency


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| <u>Stressors</u>                      | <u>Responses<sup>a</sup></u> |                |
|---------------------------------------|------------------------------|----------------|
|                                       | <u>Number</u>                | <u>Percent</u> |
| Starting/Finishing "A" or "C" School  | 20                           | 87             |
| Christmas season                      | 19                           | 83             |
| Vacation                              | 13                           | 56             |
| PCS orders                            | 11                           | 48             |
| Change in recreational habits         | 10                           | 43             |
| Change in work hours/conditions       | 9                            | 39             |
| Change in living conditions           | 8                            | 35             |
| Receipt of medal                      | 6                            | 26             |
| Addition to family                    | 4                            | 17             |
| Spouse started work                   | 4                            | 17             |
| Change in social activities           | 4                            | 17             |
| Death of close family member          | 3                            | 13             |
| Change in family members health       | 3                            | 13             |
| Promotion                             | 3                            | 13             |
| Financial Difficulties                | 3                            | 13             |
| Holiday separation                    | 3                            | 13             |
| Change in number of family gatherings | 3                            | 13             |
| Minor violations of the law           | 3                            | 13             |
| Passed over                           | 2                            | 9              |
| Pregnancy                             | 2                            | 9              |
| Death of a shipmate                   | 2                            | 9              |
| Amount of loan under \$50,000         | 2                            | 9              |
| Change in sleeping habits             | 2                            | 9              |
| Marital separation                    | 1                            | 4              |
| Personal injury or illness            | 1                            | 4              |
| Marital reconciliation                | 1                            | 4              |
| Sex difficulties                      | 1                            | 4              |
| Trouble with in-laws                  | 1                            | 4              |
| Captains mast                         | 1                            | 4              |

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<sup>a</sup>N=23

regarding stress levels of BESS students and the need for including stress reduction and management class in the curriculum.

## Chapter 5

### DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this chapter is to answer the two research questions in light of the data gathered and to develop conclusions based on that data regarding stress among BESS students. Implications and recommendations for applying the findings to the BESS curriculum and opportunities for further research will also be presented.

#### Discussion

The purpose of this evaluation study was to examine the beliefs of BESS instructors regarding the stress levels of BESS students. Two research questions guided this study. The literature review did demonstrate that stress is a problem in education because it interfered with the quest for self-actualization.

The educational philosophy and theology of Clinbell (1992) and Menconi, Peace, and Coleman (1989) indicates that stress is also a problem for HRE. Other research (Pokorski, 1992) indicates that stress is a problem in American society. The military shares the same stressors of society in general with stressors unique to military life. Submariners have stressful events peculiar to their community.



Many of the work stressors which military members share with their civilian counterparts include role conflict, ambiguity, work overload, and competition for positions. Military members also have stressors due to their obligations of service, frequent change of commanding officers, the military rank system, regimentation regarding courtesy and uniform regulations, frequent moves, and prolonged absence from family and other support systems (Solis, 1991; Pokorski, 1992).

Brantler (n.d.), Earhart (n.d.), Snyder (1978), and Weybrew (1992) report that submariners have additional stressors to contend with in their work environment. These stressors include perceived danger of radiation and other atmospheric contamination, concern about seawater pressurization, space restriction, family separation, adverse effects of asynchrony of day-night cues upon sleep, excessive noise levels, work overload and underload, and environmental conditions tending to produce insomnia, boredom, and fatigue.

Input from the BESS staff provide background information on BESS educational goals and objectives with insight into life aboard a submarine. This information helped focus the study and develop the research questions. Further, their input assisted in determining how the results could be applied to assist

BESS students in their studies and development as sailors.

The data gathered provided answers to the two research questions. The average level of stress found among the students sampled was 152.08 points with a range of 63-260 points. The majority of the students (56.6%) were found to have low stress levels. The rest of the students (43.4%) were found have stress levels between 151-300 points. No students were found to have high levels of stress.

The major life events causing stress among those surveyed were related to starting or finishing their schooling, the Christmas holiday season, vacations, and changes related to relocating to new duty assignments and responsibilities. The other stressors listed were of a more personal nature and could not be categorized as being germane to the group at large.

#### Conclusions

The first research question for this study was: What is the average level of stress among the students sampled in this study? The conclusion, based on this research question, is that the BESS students surveyed are not experiencing a high degree of stress. The majority reported low stress levels and the group mean was only 2.1 points above the score separating the low stress level and the middle stress level.

The second research question for this study was: Within the limits of the survey instrument, what are the major life events causing stress with those BESS students surveyed? The major life events causing stress among BESS students are those associated with the educational process, American cultural traditions, and changes related to moving to a new area and responsibilities. Other life events may be of a more personal nature and are not reflective of the majority of students attending BESS.

These conclusions demonstrate that there are stressors affecting students attending BESS. While the levels of stress may be low, the results of this research indicate that BESS students do experience stress. The stressors tend to reflect the changes associated with military training and education.

#### Implications

There are two basic implications which can be inferred from this research. The first is that, while the stress levels of the BESS students surveyed may be considered low, stress can be a problem for some BESS students. Instructors and other staff members need to know the signs and symptoms of stress in order to identify students who may be experiencing high levels of stress. With this information, staff and instructors

could assist students in making required adjustments in order to succeed both in BESS and in military life.

The second implication is that students need to be informed regarding stress symptoms and signs in order to assist their shipmates and themselves. This information would assist students in both their educational and personal lives. The focus of this training would be on helping students develop the knowledge needed to identify stress and stressors, but to develop those those behaviors, believes, and attitudes needed to cope with stress.

#### Recommendations

The following five recommendations were made as a direct result of this research:

1. That the director of BESS request the Mental Health Department of Naval Hospital Gaton to conduct further in the area of stress among BESS students. This research would enable the BESS staff to determine if the data found in this research is representative of the majority of BESS students.
2. That stress information be taught to BESS students during their first week of instruction. This instruction on the nature of stress and stress reduction could help the students adjust to the military and enhance their ability to learn.

3. That the Religious Ministries Department conduct training regarding the identification and treatment of stress and stress related problems for its professional staff. This would increase the staffs ability to provide pastoral care and counseling to BESS students and staff.
4. That further research be conducted on the revised Holmes-Rahe scale to reflect submarine life and culture. This research would help refine the revised Holmes-Rahe scale, plus gather more information regarding the stressors relating to submarine life.
5. That the BESS staff conduct training regarding the identification and treatment of stress and stress related problem for all staff members. This training would help the staff members identify students with stress problems as well as help the staff members identify stressors in their own lives.

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APPENDIXES



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Helping Churches Grow  
Into The 21st Century

Permission Letter

Tuesday, November 10, 1992

Cdr. James C. Duncan  
Chaplain's Dept.  
Naval Submarine School  
Code 01C Box 700  
Groton, CT 06349

Dear Cdr. Duncan:

Thank you for your call last week concerning the use of the revised Holmes-Rahe Stress Scale. We received permission from Dr. Rahe to use and adapt this scale for the Navy Chaplain training. I believe we are at liberty to give you permission to use this scale in your professional use in the Navy context.

Please let us know if we can be of further help in your ministry.

Sincerely,

A handwritten signature in dark ink, appearing to read "W. Charles Arn", with a long, sweeping flourish extending to the right.

W. Charles Arn,  
President

WCA:bs

Church Growth, Inc.  
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## Appendix B

## Survey Instrument

**STRESSORS THAT IMPACT HUMAN HEALTH**Receptivity - Rating Scale

We in the Religious Ministries Department are seeking ways to help you succeed at Basic Enlisted Submarine School. By your voluntarily completing the following questionnaire you will enable the chaplains to develop programs which will help you and your shipmates.

Because this information is confidential PLEASE DO NOT place your name, ethnic group, or SSN on this questionnaire.

Please complete the following questions:

AGE \_\_\_\_\_

EDUCATION  
(CHECK ONE)

RANK \_\_\_\_\_

HIGH SCHOOL \_\_\_\_\_

PROGRAM YOU ARE IN:  
(CHECK ONE)

1-3 YEARS OF \_\_\_\_\_

COLLEGE

COLLEGE DEGREE \_\_\_\_\_

\_\_\_\_\_ SUBFARER/STRIKER

GRADUATE DEGREE \_\_\_\_\_

\_\_\_\_\_ SAEF

\_\_\_\_\_ FLEET RETURNEE

\_\_\_\_\_ "A" SCHOOL GRADUATE (YN, MS, HN, ETC...)

TIME ON ACTIVE DUTY:

\_\_\_\_\_ YEARS \_\_\_\_\_ MONTHS

Place a check next to each event which occurred to you in the past 12 months.

ScaleActivity

|         |                                                      |
|---------|------------------------------------------------------|
| ___ 100 | Death of Spouse (Natural, Accidents, War Situations) |
| ___ 73  | Divorce                                              |
| ___ 65  | Marital Separation                                   |
| ___ 63  | Courts Martial, Correctional Custody                 |
| ___ 63  | Death of Close Family Member                         |
| ___ 62  | Passed Over                                          |
| ___ 60  | First Deployment                                     |
| ___ 53  | Personal Injury or Illness                           |
| ___ 50  | Marriage                                             |
| ___ 49  | Medical Discharge                                    |
| ___ 47  | Selective Early Retirement Boards                    |



|     |    |                                                              |
|-----|----|--------------------------------------------------------------|
| ___ | 46 | Deployment                                                   |
| ___ | 45 | Marital Reconciliation                                       |
| ___ | 45 | Retirement                                                   |
| ___ | 44 | Change in Family Member's Health                             |
| ___ | 40 | Pregnancy                                                    |
| ___ | 39 | Sex Difficulties                                             |
| ___ | 39 | Addition to Family                                           |
| ___ | 38 | Reduction to Lower Rank/Rate                                 |
| ___ | 37 | Promotion with Increased Responsibility                      |
| ___ | 37 | Death of Shipmate/s                                          |
| ___ | 35 | War Time Condition                                           |
| ___ | 33 | Financial Difficulties                                       |
| ___ | 31 | Mortgage or Loan over \$ 50,000                              |
| ___ | 30 | Foreclosure on Mortgage or Loan                              |
| ___ | 29 | Trouble With In-Laws                                         |
| ___ | 27 | Receipt of Medal, Letter of Commendation                     |
| ___ | 26 | Spouse Starts Work                                           |
| ___ | 26 | Starting/Finishing "A" or "C" School, OCS, Boot Camp         |
| ___ | 25 | Change in Living Conditions (Base Housing; Economy Overseas) |
| ___ | 23 | Captain's Mast/Office Hours/UCMJ Violations                  |
| ___ | 20 | Change in Work Hours/Conditions                              |
| ___ | 20 | PCS Orders                                                   |
| ___ | 19 | Change in Recreational Habits                                |
| ___ | 18 | Change in Social Activities                                  |
| ___ | 18 | Mortgage or Loan Under \$ 50,000                             |
| ___ | 17 | Holiday Separation Due to Deployment                         |
| ___ | 16 | Change in Sleeping Habits (Shipboard Duty; Deployment)       |
| ___ | 15 | Change in Number of Family Gatherings                        |
| ___ | 13 | Vacation                                                     |
| ___ | 12 | Christmas Season                                             |
| ___ | 11 | Minor Violations of the Law                                  |

\_\_\_ TOTAL SCORE

(Adapted from the Holmes-Rahe Stress Scale. Used by permission.)

