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The Significance of Dispositional Optimism and Coping in Predicting Psychological Distress, Life Satisfaction, Health Perception, and Frequency of Discharges in the Automatic Implantable Cardioverter Defibrillator (AICD) Patient

Paul B. Damin

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"The optimist proclaims that we live in the best of all possible worlds; and the pessimist fears this is true."
--James Branch Cabell.
THE SIGNIFICANCE OF DISPOSITIONAL OPTIMISM AND COPING IN PREDICTING PSYCHOLOGICAL DISTRESS, LIFE SATISFACTION, HEALTH PERCEPTION, AND FREQUENCY OF DISCHARGES IN THE AUTOMATIC IMPLANTABLE CARDIOVERTER DEFIBRILLATOR (AICD) PATIENT

by

Paul B. Damin

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1993
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Paul B. Damin
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ABSTRACT

The Significance of Dispositional Optimism and Coping in Predicting Psychological Distress, Life Satisfaction, Health Perception, and Frequency of Discharges in the Automatic Implantable Cardioverter Defibrillator (AICD) Patient

by

Paul B. Damin, Doctor of Philosophy
Utah State University, 1993

Major Professor: Dr. Elwin Nielsen
Department: Psychology

Dispositional optimism, as a stable outcome expectancy, has been shown to predict health outcomes in several contexts. Research has demonstrated that health-impaired subjects with optimistic outlooks fared better than those with a pessimistic outlook. Choice of coping strategies has been theorized as the mediating factor through which optimism operates. However, the construct of dispositional optimism has been challenged as a polar opposite of neuroticism, thus contending that optimism is not an independent notion.

The present study was designed to evaluate further the theoretical underpinnings of dispositional optimism theory.
Subjects were selected from a population of cardiac patients who received an automatic implantable cardioverter defibrillator (AICD). This device, designed to save the patient from sudden cardiac death, dispenses an electric shock to the heart should it exhibit sustained ventricular tachycardia or fibrillation. This research project examined the relationship of dispositional optimism, coping, and neuroticism to psychological distress, life satisfaction, health perception, and frequency of prior AICD discharges.

Intact data from 50 of the 60 participants were examined in multiple regression analyses. The results of the analyses were diverse. Principal findings were (a) general psychological distress was predicted solely by neuroticism but optimism predicted the majority of unique variance in the "style" with which subjects approach the assessment of distress; (b) optimism was subsumed under neuroticism in predicting health perception; (c) avoidance coping interacted with optimism in predicting a significant amount of unique variance over and above neuroticism in the number of AICD discharges experienced by the patients. In this latter finding, pessimistic patients who did not use avoidance coping received a greater number of discharges. Thus, optimism and neuroticism were not parallel constructs in all dependent variables. Also, the optimism/avoidance
coping interaction in predicting an actual medical outcome was unprecedented. Limitations and directions for future research were discussed. (186 pages)
CHAPTER I
INTRODUCTION

Statement of the Problem

Over the years, health psychology research and theory have focused on understanding the behavioral and psychological adjustments one makes when faced with life-threatening illness. Significant changes in health status are thought to produce a discrepancy between beliefs about the healthy self and the new, unhealthy self (Scheier & Carver, 1985, 1987). According to Scheier and Carver (1985, 1987, 1988), resolution of this discrepancy occurs through behavioral self-regulation, which describes the processes that underlie goal-directed activities. Most relevant to this model is the idea that self-regulated behavior is greatly affected by expectations about the potential outcome of one's actions. That is, both physical and emotional adjustment are theorized to be directly affected by whether one foresees desired outcomes as attainable. If such outcomes are viewed as within reach, the individual will continue to exert effort toward that goal, and alternatively, will disengage if the outcome is believed to be unattainable. The concept of "dispositional optimism" has been developed by Scheier and Carver (1985) to describe this generalized outcome expectancy.
Dispositional optimism is considered to be a stable generalized outcome expectancy related to, and predictive of, health behavior and outcome. Using a reliable and valid measure of dispositional optimism called the Life Orientation Test (LOT; Scheier & Carver, 1985), research studies have consistently supported theoretical predictions in diverse applications, including college students facing final exams (Scheier & Carver, 1985), depressive symptoms in post-partum women (Carver & Gaines, 1987), aftercare treatment of alcoholics (Strack, Carver, & Blaney, 1987), coronary artery bypass patients (Scheier et al., 1989; Scheier et al., cited in Scheier & Carver, 1992), myocardial infarction patients (Desharnais, Godin, Jobin, & Valois, 1990), women recovering from breast cancer (Pozo et al., cited in Scheier & Carver, 1992), and men at risk for AIDS (Taylor et al., 1992). Taken together, these studies suggest that optimism is positively related to favorable recovery and adaptation to illness.

Further, the manner in which patients cope with stress has been examined as a possible mechanism by which dispositional optimism relates to outcomes (Scheier, Weintraub, & Carver, 1986; Carver, Scheier, & Weintraub, 1989). This research has demonstrated that optimists cope differently than pessimists. Specifically, optimists are more likely to use problem-focused coping, whereas pessimists use emotion-focused coping. Problem-focused, or
active coping, which is geared towards problem solving or altering the source of threat, is considered to be a more adaptive response. Conversely, people who cope emotionally are more likely to deny, distance, and disengage from the stressor. Optimists do, however, also use emotion-focused coping, which suggests a greater flexibility in this group (Scheier & Carver, 1992; Carver, Scheier, & Pozo, 1992). Research has shown that health outcomes are related to choice and implementation of coping strategies (e.g., Moos, 1982).

There is a group of cardiac patients who would provide a worthwhile opportunity to study the relationship between dispositional optimism, coping, psychological adjustment, and physical health. These patients have developed life-threatening ventricular arrhythmias and many have been resuscitated from sudden cardiac death, the leading cause of death in middle-aged men in the United States (Hatton et al., 1989; Tchou et al., 1989). When a poor response to antiarrhythmic medications occurs in these patients, many of them receive a device called the automatic implantable cardioverter defibrillator (AICD), which they depend on for continued survival (Keren, Aarons, & Veltri, 1991). The AICD is surgically implanted to automatically provide an electric shock to the heart should an arrhythmia be detected. The first such device used clinically in humans was implanted in 1980 (Mirowski, 1985). Since that time
several thousand implants have been done in the United States (Teplitz, Egenes, & Brask, 1990).

AICD patients are faced with a unique set of circumstances. In addition to the usual psychological and social adjustments related to heart disease, the patients' lifestyles are further complicated by dependence on an implanted device that would "save" them should they experience recurrences of life threatening arrhythmias (Tchou et al., 1989). As such, there are a number of fears experienced by the AICD patient. The two most salient ones are fear of being shocked and fear of not being shocked. Other concerns are physical disfigurement, depression, anxiety, and decreased self-reliance (e.g., driving, work restrictions).

Research on the psychological ramifications of the AICD device is scant. The few published studies, equivocally designed, have focused on psychiatric morbidity (Morris, Badger, Chmielewski, Berger, & Goldberg, 1991), anxiety and depression (Keren et al., 1991), group support intervention (Badger & Morris, 1989), and reemployment following implant (Kalbfleisch et al., 1989). Other papers published to date are descriptive in nature. They are based primarily on experience rather than systematic observation (Pycha, Kadri, Gulledge, Maloney, & Hutzler, 1986; Vlay, 1986; Tchou et al., 1989). It has also been demonstrated that psychological disturbances and depression contribute to
ventricular arrhythmias through decreased parasympathetic tone (Dalack & Roose, 1990; Rainey, Pohl, & Bilolikar, 1982; Reich, Desilva, Lown, & Murawski, 1981), which has implications for shock risk in these patients.

Dispositional optimism provides a useful theoretical framework to study the health-related psychological and social adjustments found among AICD patients. Further understanding of these variables should lead to more organized and coherent treatment approaches. This study extends the theoretical concepts of Scheier and Carver (1985) to the AICD patients through study of the association between dispositional optimism, coping, life satisfaction, neuroticism, and psychological adjustment. These variables are then related to specific health-related factors of the AICD patients, such as number of shocks received, heart functioning, physical health, health habits, and health perceptions.

**Purpose and Objectives**

The purpose of this research project was two-fold. First, the theoretical concepts related to control theory and generalized outcome expectancy (dispositional optimism) are extended to a new population of health-impaired patients. Based on prior research, the relationship of dispositional optimism to several dependent variables was examined for further evidence of the validity of the theory.
In addition, challenges (i.e., neuroticism) to the dispositional optimism construct are further explored.

The second purpose of this study was to learn considerably more about the AICD patient than is known currently. This information included an investigation of psychological distress, coping, life satisfaction (or well-being), physical functioning, and, unique to this population, the resolution of ventricular arrhythmias (i.e., number of shocks). The relationship of psychological variables in predicting physical functioning was of particular interest in this study.
CHAPTER II
REVIEW OF RELATED LITERATURE

This literature review addresses first the theoretical underpinnings of behavioral self-regulation and dispositional optimism. Next, research describing the psychological and physical characteristics associated with having an automatic implantable cardioverter defibrillator (AICD) in the cardiac patient is reviewed. The rationale for investigating the role of dispositional optimism in the AICD patient is presented in the final section.

Control Theory and Behavioral Self-Regulation

The basic tenet of control theory is that behavior and self-perception have an integrated purpose to maintain a convergent and homeostatic environment (Scheier & Carver, 1988; Carver & Scheier, 1982). This regulatory process occurs via a negative feedback loop, where comparisons between goals (reference values) and present activities, states, or qualities result in behavioral adjustments. The aim of such modifications is to reduce or negate discrepant perceptions about the self as much as possible. As a lifelong, continuous process, behavioral self-regulation allows the person to progress towards behavioral standards and goals with a built-in corrective mechanism. For example, if one's goal is to live a long, healthy life, one must
perceive oneself as engaging in healthy behaviors. Since cigarette smoking is discrepant with that goal and self-perception, the obvious behavioral adjustment is to quit smoking, resulting in immediate positive health consequences and an extended life expectancy.

It is not always possible, however, to make discrepancy-reducing adjustments (Carver & Scheier, 1990; Scheier & Carver, 1988). Any number of interruptions or obstacles may impede this process, such as the development of a heart condition in the person who expects to live a long, healthy life. When behavioral attempts do not lead immediately to the desired outcome, the person pauses to evaluate the situation. This evaluation leads to a subjective judgment of the likelihood that the discrepancy will be reduced successfully—an outcome expectancy. There are two types of outcome expectancies, positive and negative. A positive expectation, the belief that one has the resources and abilities to achieve a positive end-result adequately, will lead to continued striving towards the goal. Alternatively, negative expectancies lead to disengagement, either behavioral or mental. The evaluatory process of determining outcome expectancy is called "metamonitoring," because it is essentially an assessment of the self-regulation process described above.

Additionally, Carver and Scheier (1990) and Scheier and Carver (1988) have postulated affective consequences and
concomitants of outcome expectancies. These emotional experiences are dependent upon the perceived cause of the outcome, which the authors note is similar to attribution theory (Weiner, 1982). Specifically, favorable expectancies attributed to one's own efforts will lead to feelings of pride, whereas environmentally derived expectations lead to feelings of gratitude. Similarly, negative expectancies attributable to one's own failings result in shame, whereas perceptions of environmental influence lead to feelings of anger. Also, affect can act recursively on the entire behavioral self-regulatory mechanism by interrupting the discrepancy-reducing process and influencing the outcome expectancy. This affective influence can occur when the person is aroused with fear or anger, which might change the course of his or her response. Mood states may also impact the discrepancy-reducing process by eliciting different types of thoughts. A positive mood, leading to access of positive thoughts, may actually enhance the favorable evaluation of the outcome. A negative mood state could have the opposite effect.

By definition, the self-regulatory process depends on a level of self-focus or awareness (Scheier & Carver, 1988; Carver, 1979). Self-focus is necessary to perceive a discrepancy between the reference value and present action, thereby initiating the comparison process. Without this
condition of self-awareness, discrepancy is not perceived and behavior does not change.

Research on the above theory has generally supported its propositions. Studies have demonstrated the salience of self-focus in arousing attention to inner states, including affective experiences (Carver, 1979). In the case of aggression, for example, it has been shown that subjects with increased self-awareness were more likely to match their behavior to previously stated attitudes (the reference value) than less self-aware subjects. It has also been demonstrated that the valence of outcome expectancies predicts the behavior of the subject. In a study involving subjects with previously held beliefs about and fear of approaching snakes, Carver, Blaney, and Scheier (1979a) found that those who felt they could overcome their fear persisted in the task, whereas subjects who doubted their ability withdrew. A second study (Carver, Blaney, & Scheier, 1979b) showed that subjects who were led to believe that they would fail at a reasoning task decreased their persistence at the task, whereas subjects given a positive outcome expectancy increased their persistence.

More recently, Scheier and Carver (1985) have proposed a construct called "dispositional optimism." They consider this expectancy to be a highly salient and potent predictor of outcome. The next section will provide the definition
and empirical evidence for the validity of the dispositional optimism construct.

**Generalized Outcome Expectancies--Dispositional Optimism**

Two types of expectancies have been proposed in the literature. Bandura (1977) described efficacy expectations and outcome expectations in relation to behavior response, change, and prediction. Self-efficacy expectations (SE) refer to beliefs that one can successfully perform a behavior to accomplish a desired outcome. Alternatively, outcome expectancy refers to the belief that a desired outcome will occur. Bandura (1977) believes that situation-specific efficacy expectancies predict behavioral outcome in a specific domain. In contrast, Scheier and Carver (1985) have proposed that the best predictor of behavior is generalized outcome expectancy, such as dispositional optimism. Although perceptions of self-efficacy are an important component of ultimate outcome, other external sources of expectancies, including environmental factors, religious views, and beliefs about efficacy of external assistance (Scheier & Carver, 1992) are also consequential. In this broader sense, "when the person believes that the situation favors goal attainment, and that reasonable effort will yield success, a sense of personal efficacy (as opposed to a locus-independent optimism) is less important" (Scheier & Carver, 1992, p. 220).
However, Scheier and Carver have not attempted to research the relationship between DO and SE, perhaps because the theories are inherently different in terms of specificity. SE is considered to be highly situation specific (Bandura, 1977), whereas DO is generalized. Nonetheless, Maddux, Sherer, and Rogers (1982) studied the effects of efficacy expectancies and outcome expectancies on behavioral intention. They found that increases in outcome expectations were related to increases in intentions, that self-efficacy did not have corresponding significant effects, and that outcome expectancy influenced perceptions of self-efficacy. These authors noted that the minimal risk of aversive consequences in their task may account for the reduced effect of self-efficacy. Despite this critical comment, this study suggests that outcome expectancies may be more influential than Bandura contended.

Dispositional optimism (DO), defined as "the expectation that good things will happen," was advanced by Scheier and Carver in 1985 (Scheier & Carver, 1985, p. 223). It is their contention that optimistic expectations will lead to a favorable evaluation of one's efforts and, thus, to continued striving towards one's goals. On the other hand, pessimistic expectations will lead to early disengagement. To assess DO, the researchers developed the Life Orientation Test (LOT; Scheier & Carver, 1985). In the next section, experimental evidence to support the DO
construct will be presented, followed by a review of the relationship between DO and coping.

Validity of Dispositional Optimism

In their earliest test of the model, Scheier and Carver (1985) examined DO and physical symptomatology in college students during a stressful examination period. Those subjects reporting higher levels of DO, as measured by the LOT, were expected to have fewer physical symptoms than the pessimistic subjects. Results showed that DO was negatively correlated with number of reported physical symptoms. Furthermore, DO measured 4 weeks prior to final exam (Time 1) predicted prospectively the number of physical symptoms reported immediately prior to the final exam (Time 2). When the effects of reported symptoms from Time 1 were partialled out, the correlation between DO and Time 2-reported symptoms remained statistically significant. The researchers concluded that DO was an adequate predictor of symptom self-reports. However, this study was limited by the lack of a behavioral or physiological measure. For this reason it cannot be concluded that DO can predict physical symptomatology, only self-report.

The robustness of the DO construct has been evaluated in several health-related and clinical contexts as well. Strack and colleagues (1987) studied alcoholics in a 90-day
residential aftercare program. They found that optimism was significantly associated with successful completion of the program, and that the magnitude of the relationship increased when controlling for the role of daily "hassles" and periodic "uplifts." However, in a more recent study of patients in an inpatient alcohol treatment program (Carver & Dunham, 1991), DO failed to predict return to drinking while still in the program, whereas expression of confidence in future abstinence did. This finding is explained by the more constrained nature of the inpatient setting. That is, when behavior is under a great deal of external control, as it would be in an inpatient treatment setting, actions are less likely to be influenced strongly by generalized expectancies. This study demonstrates clearly the rule of matching the specificity of the expectancy to the specificity of the desired outcome.

In a study of the impact of DO on the resistance of postpartum depression in new mothers, Carver and Gaines (1987) assessed DO and depression in the third trimester of pregnancy and depression again between the third and fourth week postpartum. Controlling for depression prior to giving birth, they found that postpartum depressive symptoms were less likely in women who were more optimistic. This result was more pronounced when the researchers analyzed a subsample of the women who were not depressed prior to giving birth (44 of the 75 women). One problem with this
study was that DO was not reassessed postpartum. Consequently, it is possible that significant relationships were the result of changes in optimism over time.

One of the more thorough studies examining DO was conducted with coronary artery bypass patients (CABS; Scheier et al., 1989). These patients were assessed the day before their scheduled surgery, 6-8 days postsurgery, and 6 months postsurgery. In addition to DO, other measures included situation-specific expectancies, recovery, quality of life, coping, mood, and medical status. Statistically significant results showed that optimists versus pessimists had less difficulty during surgery, recovered faster during the first week (e.g., became ambulatory faster, were rated by staff members more favorably), and, within 6 months, resumed exercise and work more frequently and faster, and rated a higher quality of life. Domain-specific expectancies were found to be better predictors of domain-specific outcomes than general outcomes. Further, specific expectancies and DO accounted for a certain amount of variance unique from each other. Although generally supportive of the theory, the authors acknowledged three limitations of this study. First, because optimism was assessed on the day before surgery, the effect of anxiety on responding is unknown. Second, several analyses were conducted, increasing the risk of Type I error. Finally, most of the outcome data were behavioral rather than
physiological, allowing for alternative explanations for improvement.

These same CABS patients were followed for another 5 years postsurgery. Preliminary results (Scheier et al., in Scheier & Carver, 1992) suggested that optimists reported better subjective well-being, healthier habits, less pain, and a greater likelihood of continued employment than pessimists.

Psychological distress in health-related populations has also been shown to be ameliorated by DO. In a study of gay men at risk for acquired immunodeficiency syndrome (AIDS), Taylor and colleagues (1992) examined 550 human immunodeficiency virus (HIV) seropositive and seronegative subjects. They found that DO explained 35% of the variance in predicting psychological distress, regardless of HIV status. In addition, subjects higher in optimism expressed less AIDS-related worry and concerns, saw themselves at less risk of developing AIDS, and, in HIV seropositive men, perceived greater personal control over the disease. Implications and further findings related to coping in these subjects will be discussed in the next section.

A second study of psychological distress demonstrated that DO was a powerful predictor of distress in women who failed to become pregnant following in vitro fertilization (Litt, Tennen, Affleck, & Klock, 1992). Controlling for prior psychological distress, optimism accounted for the
majority (16%) of the variance in a step-wise multiple regression equation, which also included situational appraisals and use of escape as a coping strategy. In spite of the small sample size (41 women, 5 of whom conceived), the results further illustrate the robustness of the optimism construct.

Alternative explanations of dispositional optimism as measured by the LOT have been advanced. Smith, Pope, Rhodewalt, and Poulton (1989), in a study purporting to determine convergent and discriminant validity of the LOT, found that the LOT was highly correlated with another measure of optimism, the Generalized Expectancy for Success Scale (GESS; Fibel & Hale, 1978) and that neuroticism, or negative affectivity, reduced associations between optimism and other variables. With regard to the former, Scheier and Carver (1992) argued that the GESS actually measures several specific expectancies across several life domains. Thus, although the LOT and GESS are highly correlated (rs of .63, .51, & .55 in three separate samples), the GESS is not an alternative measure.

To the latter criticism, Scheier and Carver (1992) responded by factor analyzing a data set that included items from the LOT and several measures of neuroticism and trait anxiety. They found a clear optimism factor, which correlated highly with LOT scores (rs>.80). This optimism factor also predicted several other outcome measures. The
authors, therefore, argued that optimism is a component of the more general construct of neuroticism, and adds unique variance to the prediction of outcome. Marshall, Wortman, Kusulas, Hervig, and Vickers (1992) reached a similar conclusion, but they preferred a two-factor model of optimism as measured by the LOT. That is, they replicated the finding of an optimism factor and a pessimism factor, and found them to be somewhat empirically independent. Further, they found that pessimism was associated with neuroticism and negative affectivity, whereas optimism was associated with extraversion and positive affectivity. These findings suggest that the optimism/pessimism construct is much more complex than Smith and colleagues (1989) have concluded.

Taken together, the above representative studies demonstrate that DO is a construct warranting further attention. It has been shown to be a significant predictor of health outcomes and better adjustment in most applications. Positive outcome expectancies seem to result in positive outcome. To further validate this point, consider the role of pessimism as illustrated in a 35-year follow-up study. Peterson, Seligman, and Vaillant (1988) found that pessimism measured in physically and mentally healthy men at age 25 predicted poor health at ages 45 through 60. The ramifications of optimism are compelling.
The role of possible mediating factors in this expectancy-outcome relationship will be reviewed in the next section.

**Dispositional Optimism and Coping**

According to expectancy theory, favorable expectations about outcome lead to continued striving and negative expectations about outcome lead to disengagement (Carver, 1979). Continued striving or disengagement, therefore, are considered to be coping responses through which discrepancy is reduced. Scheier and colleagues (1986) proposed that optimists and pessimists use different coping strategies to mediate the discrepancy-inducing stressor.

In their study, Scheier and colleagues (1986) found type of coping to be related to DO in college undergraduates. Optimism was associated with problem-focused coping, seeking of social support, and emphasizing positive aspects of the stressful situation. The coping strategies used by pessimists included denial and distancing, focusing on stressful feelings, and disengagement. These findings have been replicated in medical populations, including CABS patients (Scheier et al., 1989) and breast cancer patients (Pozo et al., cited in Carver, Scheier, & Pozo, 1992). Pozo and colleagues (cited in Carver, Scheier, & Pozo, 1992) found an interrelationship among level of distress, choice of coping, and optimism in
breast cancer survivors. Optimism was associated with lower distress, acceptance of the reality of the situation, positive reframing, and use of humor. Higher distress, denial, and behavioral and mental disengagement were observed in pessimists.

An interesting difference between the CABS patients and the breast cancer patients was observed (Carver et al., 1992). Pessimism and distress level were related prior to surgery but not afterwards in the CABS patients, whereas pessimistic cancer patients reported high subjective distress before surgery, just afterwards, and three months later. It was suggested that the CABS patients' extended complications and recovery are less complicated than that of the cancer patients. Breast cancer patients must endure bodily disfigurement, as well as the possible recurrence of a life-threatening illness. Perhaps a second explanation for the differences had to do with the fact that the CABS patients were all men and the breast cancer patients all women.

Using the Moos Coping Scale (Billings & Moos, 1981) to assess the relationship of DO, daily life stress, and domestic environment to coping methods in cancer patients, Friedman and colleagues (1992) found that optimists used active-behavioral coping (overt, direct attempts to deal with the stressor) and did not use avoidance coping. Optimism was not related to evidence of disease or duration
of illness. However, the heterogeneous nature of the subjects in this sample and the lack of physical data made it difficult to study the mediating effects of coping.

Returning to the aforementioned study of gay men at risk for AIDS, the researchers (Taylor et al., 1992) found mild predictive relationships between DO and type of coping strategy used. Specifically, DO was positively associated with activation of positive attitudes and personal growth/helping others. Negative associations were found with fatalism/self-blame/escape-avoidance. The researchers found stronger relationships with type of coping used when using AIDS-Specific Optimism as the predictor variable, especially when HIV status was included. For example, men who were HIV seropositive and optimistic were likely to seek social support.

The above findings suggest that the mediational influence of coping on dispositional optimism is far from definitive. Much more research needs to be conducted with varying levels of specificity of optimism and coping. Nonetheless, in most studies, optimism appears to be associated with the use of positive coping strategies and pessimism with the use of less adaptive strategies. Whether this is a mediational relationship or one without cause and effect remains to be seen.
The AICD Patient

The automatic implantable cardioverter defibrillator (AICD) was developed for use in cardiac patients who exhibit refractory, malignant ventricular arrhythmias (Mirowski, 1985). Before receiving the device, these patients usually have not responded satisfactorily to anti-arrhythmic medication and other medical interventions. Most have been revived from sudden cardiac death, and most patients have had previous heart conditions (Tchou et al., 1989; Mirowski, 1985). The battery-operated AICD device is implanted subcutaneously in the abdominal area with electric leads running to two patches attached to the heart (Tchou et al., 1989). At this stage in AICD development, surgical implant requires breaking the ribs or sternum, much like open heart surgery. When the device senses a sustained ventricular tachycardia of a preset number of beats per minute, it provides an electric shock to the heart of 25 to 30 joules (Tchou et al., 1989). The perception of the strength of the shock is different for each patient, with descriptions ranging from a "thump" to "like a hand grenade going off" (Cooper, Luceri, Thurer, & Myerburg, 1986, p. 308).

As a relatively recent development in cardiology, the AICD has been used in humans in the United States since 1980 (Tchou et al., 1989). Since that time only a few studies have been conducted on the psychological effects and
adjustment requirements of the AICD recipient. These studies are markedly bereft of careful design and analysis for a number of reasons, such as limited number of subjects (especially in the earlier years). The research does, however, provide interesting observations and descriptions. Cooper and colleagues (1986) interviewed 17 AICD patients 2-21 months post-implant. Patients were asked open-ended questions on activity level, emotional reactions, physical symptoms, and other lifestyle changes. Seventy-six percent of the patients had experienced at least one spontaneous shock. Of those 13 patients, 11 expressed persistent fear. Their fears surrounded anticipation of a shock and premature battery failure. Decreased activity and social interaction were also reported by 65% and 41% of patients, respectively, because of fear of shock, deteriorating heart conditions, and surgical recovery. Several lifestyle adjustments were described by the patients as troublesome. These adjustments were directly related to the physical changes brought about by the implant, such as size and placement in the abdomen and body image. Despite their concerns, 88% of the patients were happy with their AICD.

In another project, Pycha and colleagues (1986) interviewed and assessed 18 patients at three different periods: preimplant, early postoperative, and later postoperative. At preimplant time, patients and families were anxious and fearful about the future, and sought
substantial information and support. In the early postoperative period, surgical recovery is paramount for the patients. Initial acceptance of the device as a foreign object in the body is also a major concern of this period. During the later postoperative period, all but 1 of 15 patients considered their device a lifesaver. The one female patient who did not respond positively apparently had unrealistic expectations about her renewed health. Depression and fear were noted in many of the patients, mostly related to health status, degree of functioning, and the ability to work. Those forced into early retirement were most affected by mood changes. With regard to return to work following implant, it has been reported that 62% of those patients who had been employed prior to implant were reemployed at least part-time at a mean of 11 weeks postsurgery (Kalbfleisch et al., 1989). Patients' level of education was found to be the best predictor of return to work in this sample.

Anger and anxiety have also been studied pre- and postimplant in eight AICD recipients (Vlay, Olson, & Ricchione, 1989). The patients exhibited higher anxiety and anger than did controls. The researchers also found that state anxiety decreased considerably postimplant, whereas trait scores remained unchanged.

With the increase in the number of implants being conducted nationwide, AICD recipients have been somewhat
more carefully studied psychologically in the recent past. Piasecki, Gutmann, Axtell, and Tchou (1990) studied psychological dependency and depression in 60 AICD recipients, Pycha and Calabrese (1990) investigated psychosocial adaptation in 42 patients and 38 spouses, Morris and colleagues (1991) studied psychiatric morbidity in 20 patients and their families, Keren and colleagues (1991) studied anxiety and depression in 18 patients, and Kuper and Nyamathi (1991) researched stressors and coping in 20 AICD recipients. Although it was unclear how the researchers developed a psychological dependency composite score (Piasecki et al., 1990), they found that being married was associated with lower dependency scores and better psychological adjustment. Younger AICD recipients tended to be more dependent with higher levels of depression. Of particular interest was the researchers' finding that the more serious the cardiac illness, the more positive the patient viewed the AICD device. It was unclear as to how this conclusion relates to the level of dependency. Finally, psychological dependency was uncorrelated with frequency of shocks in this sample.

After assessing depression, anxiety, and psychosocial adaptation in 42 AICD recipients and 38 spouses, Pycha and Calabrese (1990) reported their results in percentages only. Overall, depression and anxiety were low in both spouses and patients. With regard to psychosocial adaptation the major
findings can be subsumed under concerns about personal security and safety in relation to the AICD device. Unfortunately, the researchers did not analyze possible differences or recursive impact between patients and spouses.

Through semistructured psychiatric interviews, Morris and colleagues (1991) found that 50% of the patients had developed diagnosable psychiatric disorders postimplant, including adjustment disorders, major depression, and panic disorder. Family members developed adjustment disorders in 30% of the cases. Major factors related to degree of psychiatric morbidity consisted of incidence of unplanned perioperative and delayed shocks and psychopathology in a family member. The authors commented on the similarity of rate of psychopathology in this population as compared to other patients with chronic medical conditions.

Another research study used self-report measures of anxiety and depression to assess differences between AICD patients who have received spontaneous discharges while conscious, AICD patients who have not experienced any shocks, and patients with chemically controlled life-threatening ventricular tachycardias (Keren et al., 1991). The researchers found no significant differences between any of the three matched groups, perhaps related to the small sample sizes (six subjects in each group), but a trend
towards higher anxiety in the group who had received shocks was observed.

Finally, coping and stress were studied in 20 AICD recipients (Kuiper & Nyamathi, 1991) using a semistructured interview and the Jalowiec Coping Scale (Jalowiec, 1988). The results demonstrated that the subjects used a variety of strategies across both problem-focused and emotion-focused coping. An optimistic coping style was used most often, with greatest perceived effectiveness.

Overall, the AICD population has not been adequately researched in terms of psychological adjustment or effect of their implant. Further, no study has endeavored to examine systematically the impact of psychological variables on the number of AICD discharges experienced by the patients. Nonetheless, these patients have been observed informally to have several concerns about fear, restriction of independence, and overall health. There are now over 10,000 recipients of the device in the United States, with the number growing proportionally every year. Most likely, researchers are currently conducting more intensive, prospective studies with these patients and their families, leading to increased information in the near future. A second reason for studying psychological aspects in these patients has to do with findings that psychological disturbances and depression contribute to ventricular arrhythmias through decreased parasympathetic tone (Dalack &
Roose, 1990; Rainey et al., 1982; Reich et al., 1981), which has implications for shock risk in these patients. The present study, although not prospective in design, examined several factors more thoroughly with a larger sample than most studies published currently.

The AICD Patient as Cardiac Patient

Two important areas of study in cardiac patients deserve some discussion. Those areas have to do with: (a) the effects of hostility on cardiac functioning; and (b) the role of emotional arousal and depression in eliciting cardiac arrhythmias. With regard to the latter, it has been demonstrated that psychological disturbances and depression contribute to ventricular arrhythmias through decreased parasympathetic tone (Dalack & Roose, 1990; Rainey et al., 1982; Reich et al., 1981), which has implications for shock risk in the AICD patients. Rainey and colleagues (1982) examined the QT interval in drug-free depressed patients, substance-abusing patients, and normal controls. The QT interval is measured through electrocardiographic tracings. Lengthened QT intervals are known to occur in people at risk for sudden cardiac death and in patients receiving tricyclic antidepressant medication. However, these researchers found lengthened QT intervals in the drug-free depressed patients significantly more frequently than in the substance abusing or normal controls.
In a review of the literature, Dalack and Roose (1990) further commented on the relationship between depression and cardiovascular disease. They reported that sudden cardiac death in depressed patients occurs at a rate greater than that which is expected. Explanations for this phenomenon point to certain types of decreased heart rate variability in depressed patients. The diminished variability contributes to decreased parasympathetic activity, and thus paves the way for a potentially fatal ventricular fibrillation. The importance of further understanding this relationship between affect and cardiac functioning would seem paramount in the AICD patient.

The affective trait of hostility has long been considered an important predictor of coronary heart disease (Smith, 1992). Of the few studies that have failed to find an association between hostility and health, Smith (1992) suggested that mediocre measures of hostility were perhaps to blame rather than incorrect hypotheses. Nonetheless, the overwhelming evidence demonstrates the importance of including a measure of hostility in any study of cardiac patients.

**Dispositional Optimism and the AICD Patient**

The AICD population provides a unique opportunity to investigate the effects of optimism, coping, and psychological adjustment because of their dependence on a
device to sustain life instantaneously should natural mechanisms go awry. Optimism has been shown to be related to healthy adjustment in other cardiac patients (Scheier et al., 1989) whose major concerns end with surgical recovery. Thus, optimism should be equally important in long-term adjustment to an implanted, life-saving machine. The nature of this machine requires not only reliance on its life-saving capabilities but also acceptance of its mostly unpredictable intervention—electric shock.

Summary

Increasing evidence over the years has demonstrated that recovery from a life-threatening illness or on-going serious debilitation requires consideration of behavioral and psychological constituents in addition to medical care. In this respect, behavioral self-regulation and expectancy theory have been fruitful areas of research for understanding how medical patients adjust to their illnesses and life changes. Dispositional optimism, one type of generalized outcome expectancy, has been demonstrated to be an impressive predictor of health outcomes in several different contexts.

However, the mechanisms through which dispositional optimism relates to health outcomes remain unclear. Coping has been postulated as a mediating variable, through which optimism effects such outcomes. In general, optimistic
people use active, problem-focused coping, but pessimists use avoidance coping. These relationships have not been clearly demonstrated in the current literature, but suggest that the interaction between optimism and coping is worth more in-depth study. Also, others have proposed that DO is merely the "other side of the coin" from neuroticism. Thus, DO would not be an innovative construct. Contrasting evidence suggests that further study is necessary to clarify this claim.

To research these concepts, a relatively new and unstudied population of health-impaired patients was located. Although similar in many regards to other well-studied cardiac patients, these unique cardiac patients have received a life-saving implanted device that dispenses an electrical shock to the heart should it exhibit sustained fibrillation or tachycardia. Little is known about patients with this unique set of circumstances, yet their lives depend on an unpredictable and uncontrollable internal device. Several important areas of study include psychological and behavioral adjustment to the implant and its purpose, the relation of that adjustment to on-going overall physical health, and the relation of that adjustment to the need for discharges from the AICD device.

Consequently, the AICD patients provide an interesting avenue through which to assess several variables related to heart disease and psychological functioning. Further, these
patients experience on-going adjustment to a life-saving and unpredictable implanted device, which prior research with other cardiac patients suggests may impact their physical health. Therefore, dispositional optimism, as an important part of health outcomes, is hypothesized to be predictive of that adjustment and concomitant physical health. In turn, the theoretical underpinnings and challenges to dispositional optimism can be effectively studied with this group of patients. Specific hypotheses for this research project are presented in the next section.

**Hypotheses**

1. Dispositional optimism as measured by the Life Orientation Test (LOT) will be negatively associated with the proportion of shocks discharged by the AICD device.

2. LOT scores will be positively associated with primary care nurse ratings as measured by the Cardiac Nurse Ratings Form.

3. LOT scores will be positively associated with the Physical Functioning, Health Perception Scales, and Health Habits of the Short-Form Health Survey.

4. LOT scores will be positively associated with the Problem-Focused Coping (PFC) and the Positive Emotion-Focused Coping (PEFC) scales of the COPE, but will be negatively associated with the Avoidance Coping (AVC) Scale of the COPE.
5. LOT scores will be negatively associated with general psychological distress level as measured by the Global Symptom Index (GSI) and Positive Symptom Distress Index (PSDI) global scales of the Brief Symptom Inventory.

6. LOT scores will be negatively associated with neuroticism as measured by the Trait Anxiety Scale (TAS).

7. LOT scores will be positively associated with life satisfaction, as measured by the Life Satisfaction in the Elderly Scale (LSES).

8. LOT scores will be negatively associated with hostility as measured by the Cook and Medley Ho Scale (HO).

9. Scores on the LOT, HO, TAS, Physical Functioning Scale, PFC Scale, and the interaction term between the LOT and PFC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.

10. Scores on the LOT, HO, TAS, Physical Functioning Scale, AVC Scale, and the interaction term between the LOT and AVC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.

11. Scores on the LOT, HO, TAS, Physical Functioning Scale, PEFC Scale, and the interaction term between the LOT and PEFC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.
12. Scores on the LOT, HO, TAS, Health Perceptions Scale, PFC Scale, and the interaction term between the LOT and PFC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.

13. Scores on the LOT, HO, TAS, Health Perceptions Scale, AVC Scale, and the interaction term between the LOT and AVC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.

14. Scores on the LOT, HO, TAS, Health Perceptions Scale, PEFC Scale, and the interaction term between the LOT and PEFC will predict the proportion of shocks experienced by the AICD patients, controlling for age, education, SCD, and CABG.

15. Scores on the LOT, TAS, HO, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the Physical Functioning Scale of the Short-Form Health Survey, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

16. Scores on the LOT, TAS, HO, AVC Scale, and the interaction term between the LOT and AVC will predict scores on the Physical Functioning Scale, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

17. Scores on the LOT, TAS, HO, PEFC Scale, and the interaction term between the LOT and PEFC will predict
scores on the Physical Functioning Scale, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

18. Scores on the LOT, TAS, HO, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the Health Perception Scale of the Short-Form Health Survey, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

19. Scores on the LOT, TAS, HO, AVC Scale, and the interaction term between the LOT and AVC will predict scores on the Health Perception Scale, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

20. Scores on the LOT, TAS, HO, PEFC Scale, and the interaction term between the LOT and PEFC will predict scores on the Health Perception Scale, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

21. Scores on the LOT, TAS, Physical Functioning Scale, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the Global Severity Index (GSI) of the Brief Symptom Inventory in the AICD patients, controlling for age, years of education, history of Sudden Cardiac Death (SCD), history of Coronary Artery Bypass Crafts (CABG), and proportion of AICD discharges.

22. Scores on the LOT, TAS, Physical Functioning Scale, AVC Scale of the COPE, and the interaction term between the LOT and AVC will predict scores on the GSI in
the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

23. Scores on the LOT, TAS, Physical Functioning Scale, PEFC Scale of the COPE, and the interaction term between the LOT and PEFC will predict scores on the GSI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

24. Scores on the LOT, TAS, Health Perception Scale, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the GSI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

25. Scores on the LOT, TAS, Health Perception Scale, AVC Scale, and the interaction term between the LOT and AVC will predict scores on the GSI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

26. Scores on the LOT, TAS, Health Perception Scale, PEFC Scale, and the interaction term between the LOT and PEFC will predict scores on the GSI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

27. Scores on the LOT, TAS, Physical Functioning Scale, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the Positive Symptom Distress Index (PSDI) of the Brief Symptom Inventory in the AICD
patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

28. Scores on the LOT, TAS, Physical Functioning Scale, AVC Scale, and the interaction term between the LOT and AVC will predict scores on the PSDI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

29. Scores on the LOT, TAS, Physical Functioning Scale, PEFC Scale, and the interaction term between the LOT and PEFC will predict scores on the PSDI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

30. Scores on the LOT, TAS, Health Perception Scale, PFC Scale, and the interaction term between the LOT and PFC will predict scores on the PSDI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

31. Scores on the LOT, TAS, Health Perception Scale, AVC Scale, and the interaction term between the LOT and AVC will predict scores on the PSDI in the AICD patients, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

32. Scores on the LOT, TAS, Health Perception Scale, PEFC Scale, and the interaction term between the LOT and PEFC will predict scores on the PSDI in the AICD patients,
controlling for age, education, SCD, CABG, and proportion of AICD discharges.

33. Scores on the LOT, HO, TAS, PFC Scale, and the interaction term between the LOT and PFC will predict the total score of the Life Satisfaction in the Elderly Scale (LSES), controlling for age, education, SCD, CABG, and proportion of AICD discharges.

34. Scores on the LOT, HO, TAS, AVC Scale, and the interaction term between the LOT and AVC will predict the total score of the LSES, controlling for age, education, SCD, CABG, and proportion of AICD discharges.

35. Scores on the LOT, HO, TAS, PEFC Scale, and the interaction term between the LOT and PEFC will predict the total score of the LSES, controlling for age, education, SCD, CABG, and proportion of AICD discharges.
CHAPTER III

METHOD

Subjects

Subjects in this study were patients who received an automatic implantable cardioverter defibrillator (AICD) at the Hermann Hospital, a primary-affiliated hospital of The University of Texas Medical School in Houston, Texas. To be eligible for participation, a minimum time period of 2 months postimplant was required since the majority of patients resume full-time activity within 2 months postimplant (Tchou et al., 1989). In the present sample, the median time that elapsed since implant was 14 months (ranging from 3 to 59 months). During the course of the study, there were 110 AICD recipients available for participation (19 females and 91 males), with 95 from Texas, 9 from Louisiana, and 6 from other states. Of those 110 invited to participate, 80 responded to the solicitation. Sixty-eight of the 80 responders consented to participate, of whom 60 completed the study.

The 60 completed subjects consisted of 9 women and 51 men, with a mean age of 64 years ($SD = 10.86$; range = 28-79). The sample was predominantly Caucasian (90%), 5% African-American, and 1.7% Hispanic, with 3.3% choosing not to respond. The majority of the subjects were married (85%), with 6.7% widowed, 2% single, 1.7% separated, and
1.7% divorced, with one subject choosing not to respond. The mean number of marriages per subject was 1.39 (SD = .70) with an average of 3.4 children (SD = 2.04).

Regarding employment status, 66.7% of the subjects were retired, 30% were employed full-time or part-time, and 3.3% were unemployed. Additionally, the subjects were asked to indicate their profession either at present or prior to retirement. The majority (40%) were in business or agribusiness occupations. The remainder indicated employment in technical (23.3%), professional (16.7%), and skilled labor (10%) areas. Two subjects (3.3%) indicated that they were housewives, while four subjects (6.7%) either chose not to respond or gave unclassifiable responses. The mean annual income level of the respondents was in the $20,001 to $30,000 range (see Table 1), with the mode in the $40,000+ range. The mean education level of the respondents was 13.3 years (SD = 2.9), with a minimum of 8 years and a maximum of 20 years of education.

Of the 60 respondents, the researcher was unable to obtain the history of AICD discharges on two of the patients because of physician noncompliance. Six of the 58 remaining patients had received two implants because the battery was spent or there was some mechanical problem with the device. The mean number of AICD discharges received by the 58 patients was 3.90 (SD = 6.15), ranging from 0 to 30. When the number of discharges was divided by the number of
Table 1

Frequency of Respondent's Indicated Income Level

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $5,000</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>$5,001 - $10,000</td>
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<td>5.0</td>
</tr>
<tr>
<td>$10,001 - $20,000</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>$20,001 - $30,000</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>$30,001 - $40,000</td>
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<td>$40,001+</td>
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<td>25.0</td>
</tr>
<tr>
<td>Did Not Respond</td>
<td>5</td>
<td>8.3</td>
</tr>
</tbody>
</table>

months since implant, the mean proportion of discharges was .29 (SD = .42). Twenty-two subjects (37.9%) had received no shocks since their implantation. Table 2 lists the different medical reasons for implantation of the AICD. Subjects may have experienced one or more of these life-threatening conditions.

It is apparent from Table 2 that nearly half of the subjects (42.4%) in this study experienced sudden cardiac death (SCD), a leading cause of death in men in the general population between the ages of 25 and 65 (Pycha et al., 1986). Also, the majority of the patients (68%) experienced intractable ventricular dysrhythmias. In addition to the
### Table 2

**Frequency of Life Threatening Conditions Leading to AICD Implantation for Women and Men**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Frequency</th>
<th>Women</th>
<th>Men</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden Cardiac Death (SCD)</td>
<td></td>
<td>2</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>Coronary Artery Disease (CAD)</td>
<td></td>
<td>2</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td>Ventricular Tachycardia (VT)</td>
<td></td>
<td>4</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Ventricular Fibrillation (VF)</td>
<td></td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Both VT and VF (VT/VF)</td>
<td></td>
<td>1</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Other Causes</td>
<td></td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*aSubjects may have experienced one or more of these life-threatening conditions.*

AICD device, 88% of the subjects were maintained on some form of cardiac medication.

**Description of Nonresponsive Subjects**

Among the eight subjects (6 male and 2 female; all residing in Texas) who agreed to complete the study questionnaires but did not return them, the researcher discovered that two had died and three had become seriously
ill. Two others were of Hispanic origin, at least one of whom had language difficulty as per his wife's report.

As reported above, 30 potential subjects did not respond to the invitation to participate in this study. Four of these people were known to have died (all male). Of the remaining 26, gender and address were the only information available to the investigator without participant consent. Five of the patients were women, 21 were men, and 5 had addresses outside of Texas.

Measures

Life Orientation Test

The Life Orientation Test (LOT; Scheier & Carver, 1985, 1987) is a theoretically based questionnaire (see Appendix A) designed to assess dispositional optimism. An initial factor analysis yielded two principal factors. One factor comprises four items worded in a positive or optimistic direction, and the second factor consists of four items worded in a negative or pessimistic direction. Scheier and Carver (1985) have shown the LOT to have adequate psychometric properties with an alpha coefficient of .76 and test-retest reliability of .79 over 4 weeks and .72 over 13 weeks. Convergent and discriminant validity were demonstrated (Scheier & Carver, 1985) by finding mild to moderate coefficients when the LOT was correlated with instruments assessing conceptually related constructs. The
instrument consists of 12 items with eight test items and four fillers. Of the eight test items, four are pessimistic and are scored in a reversed fashion. Total scores can range from 0 to 32. Optimism is exhibited by higher scores.

**Trait Anxiety Scale**

The Trait Anxiety Scale (T-Anxiety) consists of 10 items that were derived from the parent State-Trait Personality Inventory (STPI; Spielberger et al., 1979) Correlations between the abbreviated T-Anxiety Scale (see Appendix B) and the longer version were found to range from .94 to .96 in two separate samples of both males and females. Alpha coefficients of this scale were found to be .92 in females and .88 in males with subjects 33 years or older. In college students, the T-Anxiety Scale correlated highly \( r = .69 \) for both males and females) with the Neuroticism Scale of the Eysenck Personality Inventory, thus demonstrating excellent convergent validity. In the present study the T-Anxiety Scale was interpreted as a measure of "neuroticism."

**COPE Inventory**

The COPE (Carver, Scheier, & Weintraub, 1989) consists of 60 items scored in a 4-point Likert-type scale (see Appendix C), divided evenly into 15 scales (two of which are research scales) that measure coping styles and strategies. The factor-analyzed scales are active coping, planning,
seeking instrumental social support, seeking emotional social support, suppression of competing activities, religion, positive reinterpretation and growth, restraint coping, acceptance, focus on and venting of emotions, denial, mental disengagement, behavioral disengagement, and the two research scales (alcohol/drug use and humor). Internal consistency on the 13 clinical scales ranged from .62 to .92 (except for mental disengagement, which was .45). Test-retest reliability scores ranged from .46 to .86. Convergent and discriminant validit with several personality measures demonstrated that this is a distinct instrument with mild correlations to related characteristics. Subjects responded to this questionnaire by choosing items that described coping skills employed with the most recent stressful occurrence caused by their AICD device. Subjects chose this occurrence.

**Brief Symptom Inventory**

The Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) is a 53-item self-report inventory abbreviated from the Symptom Checklist 90-R (SCL-90R; Derogatis, 1983). This scale measures nine primary symptom dimensions of somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. In addition, three global indices of distress are measured. They are the
Global Severity Index, the Positive Symptom Distress Index, and the Positive Symptom Total. Internal consistency coefficients range from .71 to .85, and test-retest reliability coefficients range from .68 to .91. Correlations between symptom dimensions of the BSI and the parent SCL-90R yielded coefficients of .92 to .99. Convergent validation of the BSI with the MMPI was obtained by reanalyzing data from a comparison of the longer SCL-90R with the MMPI. The SCL-90R had been demonstrated to have good convergence with the MMPI. It was determined from the reanalysis that reduction in the number of items of the SCL-90R, as portrayed in the BSI, did not significantly alter the validity. The scales of interest for the present research study were the Global Severity Index and the Positive Symptom Distress Index.

Life Satisfaction in the Elderly Scale

The Life Satisfaction in the Elderly Scale (LSES; Salamon & Conte, 1984) is a 40-item, multiple choice questionnaire designed to assess the quality of life in the elderly population. It yields a total score and eight factor analytically derived subscale scores. The subscales are Taking Pleasure in Daily Activities, Desired vs. Achieved Goals, Positive Self-concept, Perceived Financial Security, Regarding Life as Meaningful, Positive Mood,
Perceived Health, and Satisfaction with Social Contacts. Two psychometric studies have shown internal consistency coefficients of .93 and .92. Test-retest reliabilities for the total score of .90 for 1 month and .67 for 6 months were also reported. Coefficient alphas for the subscales ranged from .60 to .79 in one study and .47 to .78 in another, the lower scores having been found for the Goals and Self-concept subscales. Test-retest reliability for the subscales were all above .88 at 1 month. Validity for the LSES has been assessed through construct and concurrent methods. As mentioned above the eight subscales were derived from factor analysis. Two of the subscales, Health and Finance, demonstrated clear and distinct factor loadings, although the other six were not as coherent. Concurrent validity was demonstrated through comparison with data about health background, psychosocial information, and physical assessments. Overall, the total score and subscales of Daily Activities, Meaning, and Health best differentiated among the groups. There is some question about the validity of this instrument, particularly within some of the subscales. The LSES is, however, reported as an adequate and most psychometrically sound measurement of life satisfaction and well-being (Busch-Rossnagel, 1985; Dixon, 1985).
The Cook and Medley Hostility Scale (Ho; Cook & Medley, 1954) was derived from the Minnesota Multiphasic Personality Inventory. Smith (1992) has summarized the psychometric properties of this 50-item scale (see Appendix D). He reported Cronbach alpha's averaging about .80 and test-retest reliabilities with samples of medical students and middle-aged adults, in 1- and 4-year correlations, greater than $r = .80$. With regard to homogeneity of the Ho Scale, one factor analytic study (Costa, Zonderman, McCrae, & Williams, 1986) found the presence of two factors: Cynicism and Paranoid Alienation. Other researchers have suggested several conceptually based factors among the Ho items (Barefoot, Dodge, Peterson, Dahlstrom, & Williams, 1989). Ho has been found to have good convergent validity with self-reports of anger and hostility, resentment, potential for hostility, antagonism, overt hostile behavior, and enhanced recall of hostile-trait adjectives. Discriminant validity studies (Smith, 1992) have found that Ho is less correlated with depression and anxiety, neuroticism (although there is conflicting evidence for this variable), openness to experience, extraversion or conscientiousness. Several prospective studies have also examined the association between Ho and health outcomes. It was found that Ho scores predict increased risk of major coronary events and reduced survival rate from coronary events.
Despite the psychometric difficulties with this scale, Smith (1992) stated that "its (inconsistent) association with objective health outcomes in prospective studies makes this scale more immediately relevant to psychosomatic research than more psychometrically sound instruments that are as of yet untested in prospective studies" (p. 141).

**Short-form Health Survey and Health Habits**

The Short-form Health Survey (Stewart, Hays, & Ware, 1988) is a 20-item questionnaire that was developed to assess health functioning in a more time efficient fashion than pre-existing surveys. This survey (see Appendix E) measures physical functioning, role functioning, social functioning, mental health, health perceptions, and pain. For the purposes of the present research project, the measures of physical functioning (PF) and health perceptions (HP) were used. Internal consistency findings of those two scales were alphas of .86 and .87, respectively. When compared with longer versions of the same measures, PF and HP yielded nonsignificantly different coefficient alphas, indicating that the shorter scales are as consistent as longer ones. The two scales were also moderately intercorrelated (r = .53). These health measures also differentiated significantly between respondents with poor health and those from a general population.
In addition to the 20 items, eight questions (see Appendix E, Numbers 13-20) about health habits were added for the purposes of this study. These questions were designed to assess the respondents' exercise, smoking, and dietary habits.

**AICD Questionnaire**

This questionnaire (Keren, Aarons, & Veltri, 1991), for which there are no psychometric data, is a modified version of an assessment of concerns and problems of well-being and emotional adjustment to the AICD device (see Appendix F).

**Demographic Questionnaire**

Patients were asked to report a variety of demographic information, such as age, sex, race, marital status, occupation, and socioeconomic status (see Appendix G).

**Nurse Ratings**

Patients were usually followed by a primary care nurse from the time of their implant initially on a monthly, and then a bimonthly, basis. These nurses were asked to rate physical health, treatment compliance, and overall progress for each patient (see Appendix H). Each item was rated on a 3-point scale from low to high.

Each subject's primary cardiac nurse was also asked to rate the extent of cardiac medication the subject was taking. This rating was assessed with a 4-point scale from
0 (none) to 4 (a lot) and was based on number and type of medication. Such a rating was obtained because a list of actual medications for each subject was not available. Consequently, the nurses were asked, when medications were unknown, to make a best estimate given their knowledge of the patient.

Medical Chart Information

The AICD device collects and stores the number of discharges received by the implant recipient. This information was accessed for this study. Other information from patient medical charts included date of implant, number of implants, reason for implant, ejection fraction, number of prior myocardial infarctions (MI's), number of bypass surgeries, implantation of a pacemaker, and number of cardiac arrests. Ejection fraction is a measure of impaired cardiac performance (Braunwald, 1991). More specifically, it is a ratio of stroke volume to end-diastolic volume in the left ventricle of the heart. In the normally functioning heart, left ventricular volumes range from 50 to 80% (Grossman, 1991).

Procedure

Patients were mailed a letter inviting them to participate in the research study. This letter (see Appendix I) was signed by the physician in charge of their
treatment. Potential subjects were instructed to indicate their willingness to participate by signing and returning a self-addressed stamped card. Upon receipt of an affirmatively signed card, questionnaires were mailed, with a self-addressed stamped envelope for returning them to the principal examiner. Those subjects who did not return the packet of questionnaires within one month were contacted up to five times either by telephone or letter. Patients were identified on all research forms by number only.

The letter also asked for permission to gather other information from the patients' medical records and primary cardiac nurse. These data were gathered after the completed questionnaire packet was returned. Eight of the subjects received follow-up care by physicians other than those at Hermann Hospital. These patients signed a release of information, which was sent to their cardiologist with a request for pertinent information.

For those patients who did not respond to the first mailing of the invitation to participate, a second and, if needed, third solicitation were sent. Twenty subjects responded to the second request (5 declining), and none responded to the third.
CHAPTER IV
RESULTS

The purpose of this study was twofold. First, the predictive relationship of the theoretical construct of dispositional optimism (hereafter referred to as optimism) was examined in conjunction with several other subjective constructs (life satisfaction, neuroticism, hostility, psychological distress, coping, health perception, and physical functioning) and objective medical variables. Second, this study undertook a fine-grained analysis of the psychological and physical ramifications of the AICD patient.

Data analysis occurred in three steps. First, the major instruments were inspected psychometrically to determine their internal consistency and relation to normative data where available. Additional health-related and medical variables were examined in the first step. Second, zero-order Pearson's correlations between major variables were examined for significant relationships. Finally, multiple regression analyses were conducted with hypothesized sets of variables to determine predictive relationships accounting for important variable combinations.
Instrumentation

The initial step in the data analytic process was to examine each of the major instruments used in this study. First, t-tests were done to determine differences in scores on all psychological variables for men and women, although there were only nine women in the sample. None of the mean comparisons yielded statistically significant results for gender. Consequently, scores were combined for men and women. Means, standard deviations, ranges, and measures of internal consistency were inspected for psychometric properties for all of the psychological measures (see Table 3). Where appropriate, all of the instruments or scales of interest had satisfactory internal consistency.

The overall mean and standard deviation of the Life Orientation Test (LOT) in this sample are comparable to those found in a normative sample of college students reported by Scheier and Carver (1985). They reported a mean for males of 21.03 (SD = 4.56) and for women of 21.41 (SD = 5.22). In the present sample, the mean for the males was 20.60 (SD = 4.92). The nine women had a mean of 21.67 (SD = 6.19).

For the Trait Anxiety Scale, the closest normative sample was working adults aged 33 or older (Spielberger et al., 1979). Mean scores for women were 17.98 (SD = 5.45) and for males 16.27 (SD = 4.70). In the present sample, the
### Table 3

**Descriptive Statistics and Cronbach's Alpha For Each of the Major Psychological Instruments**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Life Orientation Test</td>
<td>20.77</td>
</tr>
<tr>
<td>Trait Anxiety Scale</td>
<td>16.48</td>
</tr>
<tr>
<td>Life Satisfaction in the Elderly Scale</td>
<td>136.75</td>
</tr>
<tr>
<td>Ho Scale</td>
<td>16.73</td>
</tr>
<tr>
<td>Short-Form Health Survey</td>
<td></td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>56.27</td>
</tr>
<tr>
<td>Health Perceptions</td>
<td>45.16</td>
</tr>
<tr>
<td>COPE Scale</td>
<td></td>
</tr>
<tr>
<td>Problem-Focused</td>
<td>39.98</td>
</tr>
<tr>
<td>Avoidance</td>
<td>29.24</td>
</tr>
<tr>
<td>Positive Emotion</td>
<td>24.13</td>
</tr>
<tr>
<td>Brief Symptom Inventory</td>
<td></td>
</tr>
<tr>
<td>Global Symptom Index</td>
<td>59.55</td>
</tr>
<tr>
<td>Positive Symptom Distress Index</td>
<td>54.98</td>
</tr>
</tbody>
</table>
mean for women was 16.89 (SD = 5.16) and for males 16.41 (SD = 4.34). These scores measuring neuroticism appear to be comparable to the normative sample.

The Life Satisfaction in the Elderly Scale (LSES) was standardized on people aged 55 or older (Salamon & Conte, 1984), but the present sample included 13 subjects aged 54 or below. An ANOVA determined statistically nonsignificant differences in scores between those subjects aged 54 or below (M = 136.77) and those aged 55 or older (M = 136.74), F(1,58) = .000, p = .996. Therefore, scores were combined for all age groups. The total LSES mean score of 136.75 is comparable to approximately the 50th percentile of the normative sample.

Scores on the Cook and Medley Ho Scale were compared to a sample of medical outpatients (Colligan & Offord, 1988). The researchers found mean scores of 14.3 (SD = 7.5) and 16.7 (SD = 7.8) for women and men, respectively. In the present sample, the mean scores were 15.11 (SD = 6.51) and 17.02 (SD = 6.95) for women and men, respectively. The scores in the two samples were comparable. Also of interest is the utility of Ho scores in predicting heart disease. Barefoot, Dahlstrom, and Williams (1983) used a cutoff of \geq 14 to accurately predict coronary heart disease. In the present sample, 65% of the subjects (5 women and 34 men) met the cutoff criteria.
The two Short-form Health Survey scales demonstrated poorer physical functioning and health perceptions in the present sample, as compared to a normative sample (Stewart, Hays, & Ware, 1988). In the normative sample, based on a possible score from 0 to 100, the mean for physical functioning was 78.5 (SD = 30.8) and health perception was 63.0 (SD = 26.8). For physical functioning and health perception, the means in the present sample were 22.23 and 17.84 points less than the normative sample, respectively.

The COPE Scale, which comprises 15 independent subscales, was submitted to an exploratory factor analysis to determine the most salient coping factors for this sample. A Varimax rotation indicated 15 factors, with 6 meeting the criteria for an eigenvalue of 1.00 or greater. A Scree test (see Figure 1) was done on those factors to distinguish the strongest, resulting in three prominent factors. Table 4 lists the factor loadings for each subscale on the three factors.

Using a cutoff criteria of .50 or greater, Factor 1 consists of Active Coping, Planning, Seeking of Social Support/Instrumental Reasons, and Suppression of Competing Activities. These four scales represent problem-focused coping. Factor 2 includes Mental Disengagement, Behavioral Disengagement, Denial, and Restraint Coping. These four scales represent avoidance coping. Finally, Factor 3 is made up of Religion and Positive Reinterpretation and
Figure 1. Scree plot of eigenvalues for the 15 factors of the COPE scale.

Growth. These two scales represent positive emotion-focused coping. Scores for each of the three factors were then obtained by summing the items comprising each scale. As shown in Table 3, these three factors have satisfactory internal consistency.

Although there are no norms to compare with the mean scores of these coping scales, it appears that subjects in this sample are more likely to use positive emotion-focused coping and problem-focused coping more often than avoidance coping. In addition, before responding to this questionnaire, subjects were asked to indicate their most recent
**Table 4**

*Rotated Factor Loadings for COPE Three Factor Solution*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Reinterpretation &amp; Growth</td>
<td>.40</td>
<td>.08</td>
<td>.54&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Active Coping</td>
<td>.83&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.14</td>
<td>-.07</td>
</tr>
<tr>
<td>Planning</td>
<td>.83&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.14</td>
<td>-.00</td>
</tr>
<tr>
<td>Seeking Social Support (SSS)/Emotional</td>
<td>.31</td>
<td>-.06</td>
<td>.27</td>
</tr>
<tr>
<td>SSS/Instrumental</td>
<td>.69&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.26</td>
<td>.21</td>
</tr>
<tr>
<td>Suppression of Competing Activities</td>
<td>.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21</td>
<td>-.00</td>
</tr>
<tr>
<td>Religion</td>
<td>-.09</td>
<td>.08</td>
<td>.87&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Acceptance</td>
<td>-.05</td>
<td>.32</td>
<td>.27</td>
</tr>
<tr>
<td>Mental Disengagement</td>
<td>.21</td>
<td>.71&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.41</td>
</tr>
<tr>
<td>Venting Emotions</td>
<td>.18</td>
<td>.41</td>
<td>.08</td>
</tr>
<tr>
<td>Behav. Disengagement</td>
<td>-.39</td>
<td>.56&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.07</td>
</tr>
<tr>
<td>Denial</td>
<td>-.03</td>
<td>.81&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.08</td>
</tr>
<tr>
<td>Restraint Coping</td>
<td>.23</td>
<td>.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.19</td>
</tr>
<tr>
<td>Alcohol/Drug Use</td>
<td>-.10</td>
<td>.19</td>
<td>-.14</td>
</tr>
<tr>
<td>Humor</td>
<td>.25</td>
<td>-.06</td>
<td>.25</td>
</tr>
</tbody>
</table>

<sup>a</sup>Scales meeting cutoff criteria in each factor.
stressful event related to their AICD device. Table 5 presents these data in categorical form.

Finally, in contrast to area T-score norms (M = 50, SD = 10) based on Nonpatients (Derogatis, 1983), the present sample was almost a standard deviation higher on the Global Symptom Index and half a standard deviation higher on the Positive Symptom Distress Index. These scores indicate that

Table 5
Categorization and Frequency of Stressful Events Indicated by Subjects on the COPE

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Percentage⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Implantation/Recovery</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>2. AICD Discharge</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>3. Lifestyle Changes</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>4. Faulty AICD</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>5. Cost/Hospital Bill</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Follow-up Care</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. External Accident/Stressor</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>8. Other/No Indication</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>9. No Stressful Event</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

⁴Does not add up to 100% because of rounding.
the present sample was experiencing somewhat greater psychological distress than the normative sample.

Additional Health-Related and Medical Variables

Gender differences were analyzed by t test. Two health habits and ejection fraction were statistically different for men and women. It was found that women (M = 4.89, SD = 1.76) were more likely to engage in exercise activity than men (M = 3.18, SD = .80), t(58) = -2.81, p < .01. Women (M = 3.44, SD = 1.33) were also more likely to eat low-fat snacks than men (M = 2.53, SD = 1.03), t(58) = -2.36, p < .05. Finally, of the 46 subjects (41 males and 5 women) for whom ejection fraction values were available, women had higher levels (M = 51.60, SD = 19.91) than men (M = 37.39, SD = 14.16), t(44) = -2.03, p < .05, indicating less cardiac performance impairment in women.

Health habits. The subjects were asked to respond to several questions about their health habits (see Appendix E, items 13-20). With regard to exercise, the majority (61.7%) indicated that they exercise three times a week or more, whereas 25% of the subjects do not exercise at all. Similarly, a majority of the subjects (82%) indicated that they do not use any tobacco products, whereas 13% smoke cigarettes and 5% use other tobacco products. Sixty-two percent of the subjects rated themselves as being the
"right" weight, 15% were 10-15 pounds overweight, 13% were 16-25 pounds overweight, and 8% were 26-50 pounds overweight. Two subjects reported being underweight. To assess eating habits, the subjects were asked how often they consume low-fat meals and low-fat snacks. Most subjects (68%) reported eating low-fat meals at least once a day. Slightly less than half of the subjects (47%) snacked on low-fat foods most of the time, while another 37% indicated that some of their snacks were low-fat. Six subjects (10%) reported not eating any snacks.

Nurse ratings and medical variables. Descriptive statistics for nurse ratings and salient medical variables are shown in Table 6. Scores for individual cardiac nurse ratings (see Appendix H) were based on a 3-point Likert-type scale, with three being most positive. In addition, internal consistency across the five items was assessed, resulting in a Cronbach's coefficient alpha of .63.

The proportion of discharges, a major variable in this study, was obtained by dividing the number of spontaneous shocks received by each subject by the number of months since initial AICD implant. The ratio ranged from 0 to 1.75. As previously noted, 22 subjects had not experienced any shocks.

Psychological adjustment to the AICD device. Table 7 presents descriptive statistics for subjects' reported psychological adjustment to the AICD device, as measured by
Table 6

Descriptive Statistics for Cardiac Nurse Ratings and Medical Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Nurse Ratings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Health</td>
<td>2.14</td>
<td>.61</td>
<td>57</td>
</tr>
<tr>
<td>Patient Coping</td>
<td>2.21</td>
<td>.53</td>
<td>57</td>
</tr>
<tr>
<td>Patient Compliance</td>
<td>2.53</td>
<td>.50</td>
<td>57</td>
</tr>
<tr>
<td>Patient Mental Status</td>
<td>2.09</td>
<td>.47</td>
<td>57</td>
</tr>
<tr>
<td>Nurse Reaction</td>
<td>2.75</td>
<td>.43</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>11.72</td>
<td>1.63</td>
<td>57</td>
</tr>
<tr>
<td>Ejection Fraction</td>
<td>38.94</td>
<td>15.28</td>
<td>46a</td>
</tr>
<tr>
<td>Extent of Cardiac Meds.</td>
<td>1.95</td>
<td>.62</td>
<td>58</td>
</tr>
<tr>
<td>Proportion of AICD Discharges</td>
<td>.29</td>
<td>.42</td>
<td>58</td>
</tr>
</tbody>
</table>

*aInformation not available for all patients.

the AICD Questionnaire (see Appendix F). Individual items were measured on a 5-point Likert-type scale, with higher numbers representing greater adjustment (e.g., less fear, fewer concerns, and greater well-being). For each of the individual concerns, the lowest mean score was sexual activity, indicating that subjects were somewhat less likely to engage in sexual behavior because of fears about their
Table 7

Descriptive Statistics for Subjects' Responses to the AICD Questionnaire

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Sense of Well-Being</td>
<td>3.63</td>
<td>1.12</td>
<td>60</td>
</tr>
<tr>
<td>Feelings About Life Expectancy</td>
<td>3.45</td>
<td>1.29</td>
<td>60</td>
</tr>
<tr>
<td>Anxiety Perceptions</td>
<td>3.12</td>
<td>1.25</td>
<td>59</td>
</tr>
<tr>
<td>Anger Perceptions</td>
<td>3.38</td>
<td>.94</td>
<td>60</td>
</tr>
<tr>
<td>Mood Perceptions</td>
<td>3.10</td>
<td>.95</td>
<td>60</td>
</tr>
<tr>
<td>Physical Appearance Concerns</td>
<td>3.20</td>
<td>1.05</td>
<td>60</td>
</tr>
<tr>
<td>Sexual Activity</td>
<td>2.55</td>
<td>.96</td>
<td>58</td>
</tr>
<tr>
<td>Fear of Being Shocked</td>
<td>3.58</td>
<td>1.15</td>
<td>60</td>
</tr>
<tr>
<td>Fear of Not Being Shocked</td>
<td>3.95</td>
<td>1.14</td>
<td>59</td>
</tr>
<tr>
<td>Total AICD Adjustmenta</td>
<td>29.84</td>
<td>6.18</td>
<td>56</td>
</tr>
</tbody>
</table>

aTotal AICD Adjustment consists of sum of nine items.

implant. A Total AICD Adjustment Score was obtained by summing the nine items listed in Table 7 (Cronbach's alpha = .80). The total score ranged from 14 to 43, with both median and mode at 30. There were no previous data with which to compare these means.

In addition to the nine items listed in Table 7, subjects were asked whether they would have the AICD
implanted today and whether they would advise another patient to have it implanted. A large majority (77%) reported being in favor of the implant, whereas 20% were not sure. Two subjects were against the implant. Similarly, 78% would advise another person to have the implant, 20% were unsure, and one subject would advise against the implant.

**Zero-Order Correlations**

The next step examined the relationship between variables using zero-order correlational analyses. Relevant psychological, health-related, and medical variables were submitted to Pearson's correlational analyses. Table 8 presents a correlational matrix of the major psychological variables in this study. The statistical significance and direction of the relationships were mostly as expected. The correlation between neuroticism and life satisfaction was more substantial than anticipated ($r = -.73$), accounting for 53% of the variance between the two variables. The coping variables, however, did not yield expected results, having few statistically significant correlations. Possible explanations and implications are discussed in Chapter V.

To understand further the psychological profile of the AICD patient, individual items and the total adjustment score from the AICD Questionnaire were correlated with the major psychological variables (see Table 9). Higher scores
Table 8
Correlations Among Optimism, Neuroticism, Life Satisfaction, Distress, Hostility, Health, and Coping

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Optimism</td>
<td>--</td>
<td>-.57**</td>
<td>.57***</td>
<td>-.42***</td>
<td>-.59***</td>
<td>-.27*</td>
<td>.19</td>
<td>.52***</td>
<td>.19</td>
<td>.01</td>
<td>.26*</td>
</tr>
<tr>
<td>2. Neuroticism</td>
<td>--</td>
<td>-.73***</td>
<td>.63***</td>
<td>.55***</td>
<td>.33*</td>
<td>-.22*</td>
<td>-.38**</td>
<td>-.05</td>
<td>.22</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>3. Life Satisfaction</td>
<td>--</td>
<td>-.68***</td>
<td>-.64***</td>
<td>-.32**</td>
<td>.34**</td>
<td>.62***</td>
<td>.05</td>
<td>-.16</td>
<td>.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Global Sev. Index</td>
<td>--</td>
<td>.83***</td>
<td>.36**</td>
<td>-.23*</td>
<td>-.50***</td>
<td>.07</td>
<td>.25*</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Positive Symptom Distress Index</td>
<td>--</td>
<td>.18</td>
<td>-.27*</td>
<td>-.53***</td>
<td>-.11</td>
<td>.10</td>
<td>-.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Hostility</td>
<td>--</td>
<td>-.01</td>
<td>-.19</td>
<td>.16</td>
<td>.13</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Physical Functioning</td>
<td>--</td>
<td>.57***</td>
<td>.03</td>
<td>-.06</td>
<td>-.26*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Health Perceptionb</td>
<td>--</td>
<td>.08</td>
<td>-.09</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Problem-Focused Copingb</td>
<td>--</td>
<td>.09</td>
<td>.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Avoidance Copingb</td>
<td>--</td>
<td>.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Positive Emotion-Focused Copingb</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aN = 57.
bN = 55.
*p < .05.
**p < .01.
***p < .001.
Table 9

Correlations Between Major Psychological Variables And AICD Questionnaire Items

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>AICD Questionnaire Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well-Being</td>
</tr>
<tr>
<td>Optimism</td>
<td>.21</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.35**</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>.42***</td>
</tr>
<tr>
<td>Global Sev. Ind.</td>
<td>-.25*</td>
</tr>
<tr>
<td>Pos. Distress Index</td>
<td>-.42***</td>
</tr>
<tr>
<td>Hostility</td>
<td>.03</td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>.23*</td>
</tr>
<tr>
<td>Health Perception</td>
<td>.21</td>
</tr>
<tr>
<td>Problem-Focused Coping</td>
<td>.24*</td>
</tr>
<tr>
<td>Avoidance Coping</td>
<td>-.15</td>
</tr>
<tr>
<td>Positive Emotion-Focused Coping</td>
<td>.12</td>
</tr>
</tbody>
</table>

aN: ns range from 54 to 60 due to missing data.

*P < .05.

**P < .01.

***P < .001.
on the AICD Questionnaire represent better adjustment. Neuroticism and life satisfaction were related more consistently and significantly to the AICD Questionnaire items and total adjustment score than were the other psychological variables. The total adjustment score, however, appears to be a more prominent variable in relation to these psychological variables than any single item score.

Table 10 presents correlations between the major psychological variables and cardiac nurse ratings, cardiac medication rating, and the health habits. Although the correlations were moderate to mild, the relationships with the cardiac nurse ratings were in the expected direction, except, surprisingly, for the nurses' ratings of patient compliance. For this variable, higher compliance was associated with lower optimism and life satisfaction scores, and, although not statistically significant, neuroticism increased. This phenomenon was also observed in relation to important medical variables, discussed below.

Table 10 also shows relationships with the nurses' ratings of the patients' cardiac medications. An inverse correlation was found between medication and optimism, life satisfaction, physical functioning, and health perceptions, whereas the association between medication and neuroticism and psychological distress was positive. The subjects' self-reported health habits were substantially unrelated to any of the psychological variables.
Table 10

Correlations Between Major Psychological Variables and Cardiac Nurse Ratings, Medication Ratings, and Health Habits

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Cardiac Nurse Ratings</th>
<th>Health Habits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health</td>
<td>Coping</td>
</tr>
<tr>
<td>Optimism</td>
<td>.32**</td>
<td>.32**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.23*</td>
<td>-.20</td>
</tr>
<tr>
<td>Life Sat.</td>
<td>.28*</td>
<td>.15</td>
</tr>
<tr>
<td>Global Sev. Index</td>
<td>-.27*</td>
<td>-.32**</td>
</tr>
<tr>
<td>Pos. Symptom Distress Index</td>
<td>-.31**</td>
<td>-.27*</td>
</tr>
<tr>
<td>Hostility</td>
<td>-.05</td>
<td>.02</td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>.10</td>
<td>.14</td>
</tr>
<tr>
<td>Health Perception</td>
<td>.37**</td>
<td>.27*</td>
</tr>
<tr>
<td>Problem-Focused Coping</td>
<td>.03</td>
<td>-.02</td>
</tr>
<tr>
<td>Avoid. Coping</td>
<td>.19</td>
<td>.05</td>
</tr>
<tr>
<td>Positive Emot. Foc. Coping</td>
<td>.09</td>
<td>.02</td>
</tr>
</tbody>
</table>

*Ps range from 52 to 60 due to missing data.

*P < .05.

**P < .01.

***P < .001.
Table 11 presents correlations between the psychological variables and the major medical variables of interest. This table shows several important correlations. For example, optimism was inversely related to the proportion of discharges, as were health perception and avoidance coping, whereas neuroticism, or its correlate, life satisfaction, was not significantly related. Overall, health perception, rather than physical functioning, showed the most consistent relationships with the medical variables. Ejection fraction was negatively related to psychological distress.

Interestingly, Table 11 shows that those subjects who experienced sudden cardiac death were more likely to have used problem-focused coping than other coping skills. Similarly, Table 12 shows that those subjects who experienced SCD had better adjustment to their AICD device. Other than a decrease in anxiety and anger as time from implant increased, none of the other medical variables were related in any substantial way with the AICD Questionnaire.

Correlations between major medical variables and cardiac nurse ratings, cardiac medication rating, and health habits are presented in Table 13. The most prominent variables, proportion of discharges (number of discharges divided by number of months since implant) and number of myocardial infarctions, were inversely related to nurses' ratings of patients' health and coping, as expected.
However, as ratings of patient compliance increased both proportion of discharges and number of MIs increased. Additionally, the proportion of discharges was positively

Table 11

Correlations Between Major Psychological Variables and Major Medical Variables

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Months Since Implant</th>
<th>Ejection Fraction</th>
<th>Sudden Cardiac Death</th>
<th>Coronary Artery Disease</th>
<th># of MIs</th>
<th># of CABGs</th>
<th># of Cardiac Arrests</th>
<th>Proportion of Discharges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimism</td>
<td>-.03</td>
<td>.20</td>
<td>.24*</td>
<td>-.07</td>
<td>-.15</td>
<td>-.07</td>
<td>.02</td>
<td>-.28*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.06</td>
<td>-.19</td>
<td>-.15</td>
<td>.02</td>
<td>.09</td>
<td>-.06</td>
<td>-.13</td>
<td>-.09</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>.06</td>
<td>.23</td>
<td>.11</td>
<td>-.08</td>
<td>-.24*</td>
<td>.05</td>
<td>.11</td>
<td>-.13</td>
</tr>
<tr>
<td>Global Severity Index</td>
<td>-.09</td>
<td>-.37**</td>
<td>-.05</td>
<td>.09</td>
<td>.22*</td>
<td>.08</td>
<td>-.10</td>
<td>.08</td>
</tr>
<tr>
<td>Positive Symptom Distress Index</td>
<td>-.13</td>
<td>-.36**</td>
<td>-.26*</td>
<td>.13</td>
<td>.10</td>
<td>-.00</td>
<td>-.03</td>
<td>.17</td>
</tr>
<tr>
<td>Hostility</td>
<td>-.03</td>
<td>.06</td>
<td>.07</td>
<td>.11</td>
<td>.12</td>
<td>.09</td>
<td>-.17</td>
<td>-.07</td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>.13</td>
<td>.20</td>
<td>.19</td>
<td>-.14</td>
<td>-.18</td>
<td>.09</td>
<td>.07</td>
<td>-.15</td>
</tr>
<tr>
<td>Health Perception</td>
<td>-.01</td>
<td>.49***</td>
<td>.11</td>
<td>-.30*</td>
<td>-.29*</td>
<td>-.10</td>
<td>.03</td>
<td>-.33**</td>
</tr>
<tr>
<td>Problem-Focused Coping</td>
<td>-.02</td>
<td>.02</td>
<td>.37**</td>
<td>.03</td>
<td>.17</td>
<td>-.04</td>
<td>.06</td>
<td>-.07</td>
</tr>
<tr>
<td>Avoidance Coping</td>
<td>.05</td>
<td>.03</td>
<td>.04</td>
<td>-.12</td>
<td>.27*</td>
<td>-.14</td>
<td>-.22</td>
<td>-.28*</td>
</tr>
<tr>
<td>Positive Emotion-Focused Coping</td>
<td>-.07</td>
<td>.04</td>
<td>.11</td>
<td>-.22</td>
<td>-.08</td>
<td>.05</td>
<td>.07</td>
<td>-.01</td>
</tr>
</tbody>
</table>

Note: Ns range from 53 to 60 due to missing data, except for Ejection Fraction (n = 46).

* p < .05.
** p < .01.
*** p < .001.
Table 12

Correlations Between Major Medical Variables And
AICD Questionnaire Items

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Well-Being</th>
<th>Life Expectancy</th>
<th>Anxiety</th>
<th>Anger</th>
<th>Mood</th>
<th>Appearance</th>
<th>Sex Life</th>
<th>Fear of Being Shocked</th>
<th>Fear of Not Being Shocked</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months Since Implant</td>
<td>.14</td>
<td>-.02</td>
<td>.36**</td>
<td>.24*</td>
<td>.18</td>
<td>.08</td>
<td>-.13</td>
<td>-.15</td>
<td>.01</td>
<td>.02</td>
</tr>
<tr>
<td>Ejection Fraction</td>
<td>-.04</td>
<td>-.12</td>
<td>-.19</td>
<td>.03</td>
<td>.08</td>
<td>-.16</td>
<td>.12</td>
<td>.21</td>
<td>.08</td>
<td>.00</td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.32**</td>
<td>.24*</td>
<td>.27*</td>
<td>.12</td>
<td>.36**</td>
<td>.23*</td>
<td>.13</td>
<td>-.02</td>
<td>.01</td>
<td>.26*</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>-.09</td>
<td>-.12</td>
<td>-.14</td>
<td>-.10</td>
<td>.03</td>
<td>.16</td>
<td>-.14</td>
<td>-.02</td>
<td>-.04</td>
<td>-.06</td>
</tr>
<tr>
<td># of Myocardial Infarctions</td>
<td>.00</td>
<td>.12</td>
<td>-.21</td>
<td>.06</td>
<td>-.07</td>
<td>.00</td>
<td>.06</td>
<td>-.10</td>
<td>-.03</td>
<td>-.03</td>
</tr>
<tr>
<td># of Coronary Artery Bypass Grafts</td>
<td>.18</td>
<td>.00</td>
<td>.03</td>
<td>.03</td>
<td>.15</td>
<td>.22*</td>
<td>-.08</td>
<td>.21</td>
<td>.01</td>
<td>.15</td>
</tr>
<tr>
<td># of Arrests</td>
<td>.04</td>
<td>-.09</td>
<td>-.04</td>
<td>-.16</td>
<td>-.03</td>
<td>.03</td>
<td>.07</td>
<td>-.07</td>
<td>-.04</td>
<td>-.02</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>.07</td>
<td>-.06</td>
<td>-.16</td>
<td>.11</td>
<td>-.07</td>
<td>.02</td>
<td>-.01</td>
<td>-.15</td>
<td>-.02</td>
<td>-.03</td>
</tr>
</tbody>
</table>

*Ma range from 54 to 59 due to missing data, except for Ejection Fraction (n = 46).

*p < .05.

**p < .01.
Table 13

Correlations Between Major Medical Variables and Cardiac Nurse Ratings, Medication Ratings, and Health Habits\(^a\)

<table>
<thead>
<tr>
<th>Medical Variables</th>
<th>Cardiac Nurse Ratings</th>
<th>Health Habits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health</td>
<td>Compliance</td>
</tr>
<tr>
<td></td>
<td>Mental Status</td>
<td>Reaction</td>
</tr>
<tr>
<td></td>
<td>Extent of Cardiac</td>
<td>Amt. of Exercise</td>
</tr>
<tr>
<td></td>
<td>Meds.</td>
<td># of Over Fat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lbs. Low Fat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meal Snack</td>
</tr>
<tr>
<td>Months Since</td>
<td>0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Implant</td>
<td></td>
<td>-0.28*</td>
</tr>
<tr>
<td>Ejection Fraction</td>
<td>0.22</td>
<td>0.32*</td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>0.03</td>
<td>-0.09</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>-0.03</td>
<td>-0.11</td>
</tr>
<tr>
<td># of Myocard. Infarctions</td>
<td>-0.48***</td>
<td>-0.31**</td>
</tr>
<tr>
<td># of Art. Bypass Grafts</td>
<td>-0.13</td>
<td>0.02</td>
</tr>
<tr>
<td># of Arrests</td>
<td>0.15</td>
<td>0.04</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>-0.40***</td>
<td>-0.30*</td>
</tr>
</tbody>
</table>

\(^a\)Ns range from 57 to 59 due to missing data, except for Ejection Fraction (n = 46).

* \(p < .05\).

** \(p < .01\).

*** \(p < .001\).
correlated with the cardiac medications rating and the amount of exercise reported by subjects. Health habits were generally unrelated to the medical variables.

The final correlation matrix (see Table 14) includes all of the medical variables. Scattered relationships among these variables were apparent. Incidence of ventricular tachycardia as a reason for AICD implant was most consistently related to other variables. Additionally, proportion of discharges was positively correlated with VT, number of MIs, and number of CABGs. This finding is perhaps a reflection of the unhealthy status of the heart in the AICD patient.

Multiple Regression Analyses

The final stage in the data analysis was to examine the predictive relationships between selected variables by submitting them to multiple regression analyses. Variables were entered into the equations in sets, or blocks. In this fashion, the researcher can determine the amount of variance accounted for by psychological and behavioral factors over and above that of demographic and medical variables (Cohen & Cohen, 1983). Within the first two blocks, the order of entry of the variables was determined by the magnitude of variance accounted for. The first block in each equation consisted of demographic variables of age and years of education in order to control for covariation. For the same
into the equation was determined in a forward stepwise fashion. The variables had to meet the criteria of accounting for a significant increment in variance ($R^2 > .5$). Thus, the analyses were hierarchical between sets and stepwise within the third set. (See Thompson, Gil, Abrams, & Phillips, 1992, for an example of this technique.)

For each dependent variable the statistical significance of the overall $R$, the individual standardized Beta weights, and the squared semipartial correlations (signified by $sr^2$) were examined. In addition, because the number of subjects was below 60, the adjusted $R^2$ (signified by $R^2_{adj}$) was examined (Tabachnik & Fidell, 1989). Squared semipartial coefficients refer to the "unique contribution of the independent variable to the total variance of dependent variable" (Tabachnik & Fidell, 1989, p. 151). The sum of the squared semipartial coefficients will approach the overall $R^2$.

Further, the assumptions of multiple regression procedure were tested for each equation. Normality, linearity, and homoscedasticity were tested through residuals scatterplots and normal probability plots. The assumption of normality is that errors of prediction are normally distributed around each predicted dependent variable score. Normality is assumed when the expected values correspond to actual values and the points fall along a straight line on the normal probability plot. The
assumptions of linearity and homoscedasticity (equality of variance) are met when the pattern in the scatterplot of residuals holds no observable pattern and the observations fall equally about a straight horizontal line through the center.

**Dependent Variable: GSI**

Six regression equations were conducted for the dependent variable of global severity index. Three analyses used the predictor variable of physical functioning, while the other three used health perception. In each set of three, one analysis for each of the three coping variables and its cross-product with optimism was submitted. Table 15 presents the results of the analyses. For all six of these sets of analyses, neuroticism was the only variable that accounted for a significant amount of unique variance (41%) in the global severity index.

Figures 2 and 3 present representative normal probability plots and standardized scatterplots for this group of analyses. Examination of these figures suggests that the data for these equations met the assumptions of linearity, normality, and homoscedasticity.

**Dependent Variable: PSDI**

Six regression equations were conducted for the dependent variable of positive symptom distress index, three including the predictor variable physical functioning and
### Table 15

**Multiple Regression Analysis Results for Dependent Variable Global Severity Index (GSI)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>sr$^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-.16</td>
<td>.03</td>
<td>1.18</td>
</tr>
<tr>
<td>Age</td>
<td>.04</td>
<td>.00</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>Medical Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>-.07</td>
<td>.00</td>
<td>0.22</td>
</tr>
<tr>
<td># of Coronary Artery Bypass Grafts</td>
<td>.07</td>
<td>.00</td>
<td>0.18</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>-.02</td>
<td>.00</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Psych./Behav. Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.65</td>
<td>.41</td>
<td>32.06*</td>
</tr>
</tbody>
</table>

$R^2 = .45$

$R^2_{adj} = .37$

$R = .67^*$

$^*P < .001$. 

Figure 2. Normal probability plot of standardized values for global severity index regression equations.

Figure 3. Scatterplot of residuals against predicted values for global severity index equations.
three including health perception. In each set of three, one analysis for each of the three coping variables and its cross-product with optimism was submitted. Table 16 presents the results of the analyses. For all six of these sets of analyses, optimism added 31% and neuroticism an additional 6% of the unique variance accounted for in the positive symptom distress index. No other psychological/behavioral variable added statistically significant variance in any of the equations.

Figures 4 and 5 present representative normal probability plots and standardized scatterplots for this group of analyses (dependent variable PSDI). Examination of these figures suggests that the data for these equations met the assumptions of linearity, normality, and homoscedasticity.

**Dependent Variable: Life Satisfaction**

Three regression equations were conducted for the dependent variable of life satisfaction (LSES). One analysis for each of the three coping variables and its cross-product with optimism was submitted. Table 17 presents the results of the analyses. For all three of these sets of analyses, neuroticism added 56% of the unique variance accounted for in life satisfaction. No other
Table 16

Multiple Regression Analysis Results for Dependent Variable
Positive Symptom Distress Index (PSDI)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>$\text{sr}^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Variables</td>
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</tr>
<tr>
<td>Education</td>
<td>-.15</td>
<td>.02</td>
<td>1.17</td>
</tr>
<tr>
<td>Age</td>
<td>.21</td>
<td>.04</td>
<td>2.10</td>
</tr>
<tr>
<td>Medical Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>-.23</td>
<td>.05</td>
<td>2.57</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>-.04</td>
<td>.00</td>
<td>0.68</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>.08</td>
<td>.00</td>
<td>0.27</td>
</tr>
<tr>
<td>Psych./Behav. Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimism</td>
<td>-.61</td>
<td>.31</td>
<td>23.81**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.32</td>
<td>.06</td>
<td>4.66*</td>
</tr>
</tbody>
</table>

$R^2 = .50$

$R^2_{adj} = .42$

$R = .71^{**}$

* $p < .05$.

** $p < .001$. 
Figure 4. Normal probability plot of standardized values for positive symptom distress index regression equations.

Figure 5. Scatterplot of residuals against predicted values for positive symptom distress index equations.
Table 17
Multiple Regression Analysis Results for Dependent Variable
Life Satisfaction (LSES)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>$sr^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.08</td>
<td>.01</td>
<td>0.29</td>
</tr>
<tr>
<td>Age</td>
<td>-.03</td>
<td>.00</td>
<td>0.04</td>
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<tr>
<td><strong>Medical Variables</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.08</td>
<td>.01</td>
<td>0.27</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.06</td>
<td>.00</td>
<td>0.14</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>-.11</td>
<td>.01</td>
<td>0.49</td>
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<td><strong>Psych./Behav. Variables</strong></td>
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<tr>
<td>Neuroticism</td>
<td>-.77</td>
<td>.56</td>
<td>59.56*</td>
</tr>
</tbody>
</table>

$R^2 = .59$
$R^2_{adj} = .54$
$R = .77^*$

$p < .001.$
psychological/behavioral variable added statistically significant variance in any of the equations.

Figures 6 and 7 present representative normal probability plots and standardized scatterplots for this group of analyses. Examination of these figures suggests that the data for these equations met the assumptions of linearity, normality, and homoscedasticity.

**Dependent Variable: Health Perception**

Three regression equations were conducted for the dependent variable of health perception. One analysis for each of the three coping variables and its cross-product with optimism was submitted. Table 18 presents the results of the analyses. For all three of these sets of analyses, age accounted for a statistically significant amount of the unique variance (14%) with neuroticism adding 17% of the unique variance accounted for in health perception. No other psychological/behavioral variable added significant variance in any of the equations.

Figures 8 and 9 present representative normal probability plots and standardized scatterplots for this group of analyses. Examination of these figures suggests that the data for these equations met the assumptions of linearity, normality, and homoscedasticity.
Figure 6. Normal probability plot of standardized values for life satisfaction regression equations.

Figure 7. Scatterplot of residuals against predicted values for life satisfaction equations.
Table 18

Multiple Regression Analysis Results for Dependent Variable
Health Perception

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>$\beta^2$</th>
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<tr>
<td>Education</td>
<td>.13</td>
<td>.02</td>
<td>1.00</td>
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<tr>
<td>Age</td>
<td>-.38</td>
<td>.14</td>
<td>8.00*</td>
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<tr>
<td><strong>Medical Variables</strong></td>
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<tr>
<td>Sudden Cardiac Death</td>
<td>.04</td>
<td>.00</td>
<td>0.11</td>
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<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.00</td>
<td>.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Proportion of Discharges</td>
<td>-.20</td>
<td>.04</td>
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<td><strong>Psych./Behav. Variables</strong></td>
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<tr>
<td>Neuroticism</td>
<td>-.42</td>
<td>.17</td>
<td>11.70*</td>
</tr>
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</table>

$R^2 = .39$

$R^2_{adj} = .30$

$R = .62^*$

*p < .01.
**Figure 8.** Normal probability plot of standardized values for health perception regression equations.

**Figure 9.** Scatterplot of residuals against predicted values for health perception equations.
Dependent Variable: Physical Functioning

Three regression equations were conducted for the dependent variable of physical functioning. One analysis for each of the three coping variables and its cross-product with optimism was submitted. Table 19 presents the results of the analyses. For all three of these sets of analyses, none of the psychological/behavioral variables added statistically significant variance.

Figures 10 and 11 present representative normal probability plots and standardized scatterplots for this group of analyses. Examination of these figures suggests that the data for these equations met the assumptions of linearity, normality, and homoscedasticity.

Dependent Variable: Proportion of Discharges

Six regression equations were conducted for the dependent variable of proportion of discharges, three including the predictor variable physical functioning and three including health perception. In each set of three, one analysis for each of the three coping variables and its cross-product with optimism was submitted. After the six sets of analyses were run, examination of the normal probability plots and standardized scatterplots indicated that the assumptions of normality and linearity had been
Table 19

Multiple Regression Analysis Results for Dependent Variable
Physical Functioning

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
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<th>F</th>
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<td><strong>Demographic Variables</strong></td>
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<td>.12</td>
<td>.01</td>
<td>0.64</td>
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<tr>
<td>Age</td>
<td>-.14</td>
<td>.02</td>
<td>0.92</td>
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<tr>
<td><strong>Medical Variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.21</td>
<td>.04</td>
<td>2.02</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.11</td>
<td>.01</td>
<td>0.59</td>
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<tr>
<td>Proportion of Discharges</td>
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<td>.01</td>
<td>0.63</td>
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</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

\[ R^2 = .11 \]
\[ R^2_{adj} = .01 \]
\[ R = .33 \]

*Note. Neither \( R \) nor any individual variable was significant.*
Figure 10. Normal probability plot of standardized values for physical functioning regression equations.

Figure 11. Scatterplot of residuals against predicted values for physical functioning equations.
violated. Figures 12 and 13 show representative plots for these analyses with a curved line and clustered points. Because the linear regression line is not a good fit for this group of variables, the results of the analyses will not represent the actual relationship.

To correct for the violation of assumptions, the individual variables were inspected for skewness. The dependent variable (proportion of discharges) was found to be positively skewed ($\text{skewness} = 1.72$). Therefore, a transformation was done to correct for this problem, as recommended by Tabachnik and Fidell (1989). The square root of the proportion of discharges was computed, resulting in a reduced skew ($\text{skewness} = .70$). Although not perfect, this correction improved normality and linearity above any other possible transformations (see Figures 14 & 15). Therefore, the six analyses were recalculated with the transformed dependent variable, with the results reported below.

The results for this set of analyses are presented in three tables. Of the six analyses, four were not statistically significant and had no significant psychological/behavioral predictors. Age, however, accounted for a significant amount of unique variance (13%). Consequently, the results are the same for all four equations (see Table 20). The four nonsignificant analyses included Problem-Focused Coping and Positive Emotion-Focused Coping with both health perception and physical functioning.
Figure 12. Untransformed normal probability plot of standardized values for proportion of discharges regression equations.

Figure 13. Untransformed scatterplot for proportion of discharges regression equations.
Figure 14. Transformed normal probability plot of standardized values for proportion of discharges equations.

Figure 15. Transformed scatterplot of residuals against predicted values for proportion of discharges.
Table 20

**Multiple Regression Analysis Results of Four Nonsignificant Equations for Dependent Variable Proportion of Discharges**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
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<td><strong>Demographic Variables</strong></td>
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<tr>
<td>Education</td>
<td>-.03</td>
<td>.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Age</td>
<td>.36</td>
<td>.13</td>
<td>6.78*</td>
</tr>
<tr>
<td><strong>Medical Variables</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.01</td>
<td>.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.19</td>
<td>.04</td>
<td>1.88</td>
</tr>
<tr>
<td><strong>Psych./Behav. Variables</strong></td>
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</tr>
<tr>
<td>(None)</td>
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</tr>
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</table>

$R^2 = .17$
$R^2_{adj} = .09$
$R = .41$

*P < .05.

With the inclusion of physical functioning and avoidance coping as predictor variables, the overall R became statistically significant (see Table 21). In addition to the 13% of unique variance accounted for by age, the optimism/avoidance coping interaction term and neuroticism added statistically significant increments (10% and 7%, respectively). Similarly, when physical functioning
was replaced by health perception as a predictor, health perception accounted for an additional 6% of the explained variance in proportion of discharges (see Table 22).

Table 21
Multiple Regression Analysis Results with Inclusion of Predictors Physical Functioning and Avoidance Coping for Dependent Variable Proportion of Discharges

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
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<tr>
<td>Demographic Variables</td>
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<tr>
<td>Education</td>
<td>-.03</td>
<td>.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Age</td>
<td>.36</td>
<td>.13</td>
<td>6.78*</td>
</tr>
<tr>
<td>Medical Variables</td>
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<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.01</td>
<td>.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.19</td>
<td>.04</td>
<td>1.88</td>
</tr>
<tr>
<td>Psych./Behav. Variables</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Optimism/Avoidance Coping Interaction Term</td>
<td>-.33</td>
<td>.10</td>
<td>5.80*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.29</td>
<td>.07</td>
<td>4.68*</td>
</tr>
</tbody>
</table>

$R^2 = .34$
$R^2_{adj} = .25$
$R = .58^{**}$

* $P < .05$
** $P < .01$
Table 22

Multiple Regression Analysis Results with Inclusion of Predictors Health Perception and Avoidance Coping for Dependent Variable Proportion of Discharges

<table>
<thead>
<tr>
<th>Variable</th>
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</thead>
<tbody>
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<tr>
<td>Education</td>
<td>-.03</td>
<td>.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Age</td>
<td>.36</td>
<td>.13</td>
<td>6.78*</td>
</tr>
<tr>
<td><strong>Medical Variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>.01</td>
<td>.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Number of Coronary Artery Bypass Grafts</td>
<td>.19</td>
<td>.04</td>
<td>1.88</td>
</tr>
<tr>
<td><strong>Psych./Behav. Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimism/Avoidance Coping Interaction Term</td>
<td>-.33</td>
<td>.10</td>
<td>5.80*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.29</td>
<td>.07</td>
<td>4.68*</td>
</tr>
<tr>
<td>Health Perception</td>
<td>-.30</td>
<td>.06</td>
<td>4.13*</td>
</tr>
</tbody>
</table>

R² = .40
R² adj = .30
R = .63**

*p < .05.
**p < .01.
CHAPTER V
DISCUSSION

This study was conducted to evaluate and extend the theoretical underpinnings of dispositional optimism and to further ascertain the psychological and behavioral make-up of the AICD patient. The following section will summarize and discuss the findings of the study and present suggestions for future research.

**Summary of Results**

Data analysis was conducted in three stages. First, each of the major instruments was evaluated for psychometric properties with Cronbach's alpha and comparison to norm groups where appropriate. Also in this initial step, differences in mean scores between males and females were analyzed with \( t \) tests. Next, Pearson product-moment correlations were performed between the major psychological, behavioral, health-related, and medical variables. Finally, predictive relationships among groupings of variables were analyzed with hierarchical multiple regression analyses between blocks and stepwise within blocks.

Statistically significant differences in mean scores for men and women were found with three variables. Women were more likely to engage in exercise activity, to eat low-fat snacks, and to have better cardiac pump performance.
(Ejection Fraction) than men in the study. Because these variables are of less importance to the major analyses of this study, data for men and women were combined.

Overall, the major instruments of this study (LOT, TAS, LSES, BSI, Ho, and Short-form Health Survey) were found to have satisfactory internal consistency. Comparable scores with appropriate norm groups were found except for the following instruments. Psychological distress (BSI) was found to be somewhat greater in this group of subjects than in the normative sample. Also, subjects in the present sample were less physically active and perceived themselves as less healthy than those in the normative sample for the Short-form Health Survey.

The COPE instrument, a theoretically derived 15-scale questionnaire, was submitted to an exploratory factor analysis to determine salient coping skills used by the present sample. Three factors were isolated: problem-focused coping, avoidance coping, and positive emotion-focused coping. These three scales also exhibited satisfactory internal consistency.

The subjects' psychological adjustment to their AICD device (as measured by the AICD Questionnaire) was fairly positive overall, with some reticence to engage in sexual activity postimplant. Most subjects found their implant acceptable and would both decide in favor of the implant today and advise another to have the implant. Similarly,
most subjects reported positive health habits in terms of exercise activity, cigarette smoking, weight, and diet.

The cardiac nurses generally rated their patients positively in physical health, coping, compliance, mental status, and nurse reaction. The subjects' extent of cardiac medications, as rated by the nurses, was in the moderate range.

With regard to medical variables, the majority of the subjects had serious heart conditions and histories of multiple cardiac problems. This severity was assessed through incidence of sudden cardiac death, coronary artery disease, number of coronary artery bypass graft surgeries, number of myocardial infarctions, and ejection fraction. However, the mean proportion of AICD discharges was fairly low. Over one-third of the subjects had never experienced a discharge.

Among the hypothesized relationships between dispositional optimism and salient variables, several were not statistically significant. Optimism was not significantly related to problem-focused coping, avoidance coping, physical functioning, any health habits, and cardiac nurse ratings of mental status and nurse reaction. Thus, for these correlations the null hypotheses were not rejected. In addition, a significant inverse correlation was found between optimism and cardiac nurse rating of
patient compliance where a positive correlation was expected.

This rating of patient treatment compliance tended to be correlated in the opposite direction from the other nurse ratings. For example, compliance was inversely correlated with life satisfaction, positively correlated with number of MIs, and positively correlated with proportion of discharges. Correlations of these variables with nurse ratings of health and coping were in the opposite direction. Thus, higher ratings of patient compliance were related to less optimism, less life satisfaction, more MIs, and more frequent discharges.

Other important observed correlations include that between neuroticism and life satisfaction ($r = -0.73$). This substantial relationship was much higher than anticipated. Additionally, the variable hostility, as measured by the Ho Scale, was significantly correlated with only one variable (AICDQ appearance; $r = -0.23$). The AICD Questionnaire also provided some interesting information. The total score of the questionnaire was correlated much more consistently with other variables than were the individual items, although there were few significant correlations with the medical variables.

As a group of variables, health habits did not significantly correlate with many variables. Also, among themselves, the medical variables had scattered significant
relationships. Most important to this study, the proportion of discharges was positively related to ventricular tachycardia as a reason for implantation, number of past MIs, and number of CABG surgeries.

The relationships between several predictor variables and six dependent variables (global severity index, positive symptom distress index, life satisfaction, health perception, physical functioning, and the proportion of AICD discharges) were conducted with multiple regression analyses. Each equation included three hierarchical blocks. Demographic variables were entered in the first block. Then, medical variables were entered in the second block. In the third block, the psychological/behavioral variables were entered in a stepwise fashion. This format was used to determine the contribution of each set of variables above those in the previous blocks. For this reason the increment in explained variance between variables, in addition to the overall $R^2$, was of interest.

Further, for each dependent variable a separate analysis was done for each of the three coping scales to determine their individual impact on the overall $R$ when all other variables were held constant. In addition, for dependent variables GSI, PSDI, and proportion of discharges, six sets of analyses were conducted. Three included the predictor variable health perception (with each of the three coping scales) and three included the predictor variable
physical functioning (with each of the three coping scales). These two variables were separately analyzed to determine the contribution of subjects' perceptions about their health versus their self-reported activity limitations.

For dependent variable GSI, none of the demographic or medical variables explained a statistically significant amount of unique variance (a total of 4%) in any of the six analyses. In the third block of variables, computed stepwise, neuroticism accounted for 41% of the variance in GSI. Neither physical functioning nor health perception, nor any of the coping variables provided additional explained variance. The overall variance accounted for in GSI by these variables was 45%.

Similarly, none of the demographic or medical variables was significant (a total of 13% of explained variance) when PSDI was the dependent variable. In the third step, optimism explained 31% of the variance, with an additional 6% provided by neuroticism. No other variable accounted for a significant increment in any of the six equations. The overall explained variance in PSDI was 50%.

With life satisfaction as the dependent variable, the findings for demographic and medical variables were again not statistically significant (total of 3% of the variance). Neuroticism, however, accounted for 56% of the variance in life satisfaction, for a total of 59% of the variance.
explained. No other variables provided significant increments of unique variance in the three equations.

For dependent variable health perception, age accounted for a statistically significant 14% of the unique variance, with other demographic and medical variables adding a nonsignificant 8%. The only psychological variable in the three equations adding significant variance was neuroticism (17%), for a total of 39% of explained variance in health perception.

No variables accounted for a significant portion of unique variance in any of the three equations for dependent variable physical functioning. The demographic and medical variables accounted for a total of 11% of the variance, with no additional variance provided by any of the psychological variables.

Of the six equations computed for dependent variable proportion of discharges, statistically significant variance in four of them was explained solely by age (13%), for a total of 17%. These four equations included problem-focused coping and positive emotion-focused coping, with both physical functioning and health perception. However, additional variance was accounted for in the two equations with avoidance coping. In these analyses, the cross-product between optimism and avoidance coping accounted for 10% of the unique variance, with neuroticism providing an additional 7% (for an overall total of 34%). Further, when
physical functioning was replaced with health perception, the latter accounted for an additional 6% of the unique variance in proportion of discharges, for an overall total of 40% of explained variance.

Discussion of Findings

This study was concerned primarily with the theoretical concepts of behavioral self-regulation and generalized outcome expectancy as they related to psychological adjustment and physical well-being. As a generalized outcome expectancy, dispositional optimism was hypothesized to predict decreased psychological distress, greater life satisfaction, better overall health, and fewer AICD discharges. Further, dispositional optimism was expected to be mediated by the type of coping used by the subjects. In addition, the contention that dispositional optimism is the "other side of the coin" from neuroticism was examined. Therefore, from a theoretical perspective, the major variables of interest were dispositional optimism, coping, the interaction between optimism and coping, and neuroticism (or negative affectivity).

As predictor variables, several other constructs were examined in relation to the outcome variables. These constructs are hypothesized to be associated with health outcomes, and include demographics (age and education level), medical variables indicative of cardiac health
The findings of this study were diverse. It was clear that, although optimism was important in the prediction of outcome, the input of neuroticism was substantial. With regard to psychological adjustment of the AICD patients, two dependent variables were analyzed, global severity index and positive symptom distress index. According to Derogatis (1983), the GSI and PSDI differ in the kind of psychopathology they measure. The former is a combined measure of numbers of symptoms and intensity of distress, whereas the latter is a pure measure of intensity of distress corrected for numbers of symptoms. The GSI is the more general and global score, whereas the PSDI is a measure of style or approach to the test ("augmenter" vs. "repressor").

The distinction between the GSI and the PSDI is important because of the contrasting results of the regression analyses with these two dependent variables. In the GSI, neuroticism alone accounted for a significant amount of the variance. This finding makes good intuitive sense in that those people with greater neuroticism, or negative affectivity, are very likely to be in psychological distress. However, with a more specific measure of
distress, the PSDI, optimism explained the majority of the variance, with a much smaller amount contributed by neuroticism. It can be concluded that, in this sample, the trait of neuroticism is associated with overall psychological distress, whereas optimistic expectations have a greater impact on the "style" of responding to the Brief Symptom Inventory. In other words, optimists are not likely to "amplify" their psychological symptoms, an important finding as these subjects as a whole tend to "amplify" their distress.

As a measure of well-being, the Life Satisfaction in the Elderly Scale provides another appraisal of adjustment in the AICD patient. With life satisfaction as a dependent variable, neuroticism accounted for the overriding amount of variance. To understand this result, one has to consider the quite substantial zero-order correlation between the scores on the Trait Anxiety Scale and the scores on the Life Satisfaction in the Elderly Scale (r = -.73). This large overlap of shared variance (53%) suggests that these instruments are measuring closely related constructs in this study. Thus, the results of the regression analyses for this dependent variable are not surprising.

Two self-reported measures of health functioning were also used as outcome variables. The first, health perception, refers to perceived physical health in general. As might be expected, age explained a significant portion of
the variance in health perception, where older subjects considered themselves to be less healthy. Over and above age, neuroticism added a moderate amount of significant variance, suggesting that more neurotic subjects tend to somatize to a large extent. Thus, these subjects perceive themselves as less physically healthy.

The second health functioning measure, physical functioning, measures the subjects' level of self-reported limitations in several domains of physical activity. Surprisingly, neither demographics, heart functioning, nor psychological makeup contributed statistically significant variance in the activity level of the subjects. For this sample, it appears that physical functioning was not affected by age, heart disease, or psychological traits. This finding runs counter to a survey study in which subjects reported decreased activity because of fear of shock, deteriorating heart conditions, and surgical recovery (Cooper et al., 1986). Surgical recovery was generally irrelevant in the present study because of time lapse after implantation. However, physical functioning was not related to fear of shock, but was mildly related to fear of not being shocked. It was also moderately correlated to overall adjustment to the AICD device, meaning that greater adjustment was associated with increased activity.

AICD discharges were considered to be the most objective measure of cardiac functioning and the essential
concern of interest in these subjects. This retrospective measure, collected by the battery-operated implanted control box, was corrected for number of months since the patients' initial AICD implantation. Over and above the age of the subjects, the interaction between optimism and avoidance coping predicted a significant amount of variance (10%) in the proportion of discharges, with additional small amounts accounted for by neuroticism (7%) and health perception (6%). Neither optimism nor any coping variable alone was significant.

This interaction is an important finding. None of the studies reviewed found a direct linkage between optimism and a coping strategy in predicting an actual medical outcome. To understand the interaction further, the two variables involved were split at their medians into high and low levels. A 2 x 2 matrix was then formed with the means of the dependent variable proportion of discharges. Figure 16 presents the mean scores with low and high avoidance coping plotted onto low and high optimism. The figure shows that the effect of optimism in the proportion of discharges is dependent on the level of avoidant coping. Thus, when optimism is low and avoidance coping is low, these subjects experience a greater number of AICD discharges. When avoidance coping is high, optimism does not make a difference. Similarly, when optimism is high, the level of avoidance coping makes little difference.
Figure 16. Interaction between low and high optimism and low and high avoidance coping for transformed dependent variable proportion of discharges.

Several studies have found that dispositional optimism in medical populations is associated with the type of coping subjects implemented to alleviate stressors (Scheier & Carver, 1992), which led to better psychological adjustment. In this vein, avoidance coping tended to be used by pessimists and was associated with psychological distress. However, in the present study, pessimists who do not use avoidance coping have experienced a significantly greater incidence of shocks. This interaction between optimism and coping had no significant impact on psychological distress.
What does this interaction between pessimists and nonavoidant coping mean? In a meta-analysis comparing the relative efficacy of avoidant and nonavoidant coping strategies, Suls and Fletcher (1985) found that avoidant strategies led to better adaption in the short term when the stressor was seen as threatening. Conversely, accommodation to long-term stressors involved greater use of attentional coping strategies. For the present study, two elements are important. First, there is no point of recovery for AICD patients; the device is a prophylaxis against sudden cardiac death. Second, coping was measured with a specific stressor in mind; thus, short-term coping was measured.

With the findings of Suls and Fletcher (1985) in mind, the second element suggests that those patients, whether pessimistic or optimistic, who use avoidance coping do so effectively in specific and short-term situations. The effect of long-term, or dispositional, coping on adjustment or incidence of shock was not assessed. With regard to the first element, Carver and colleagues (1992) pointed out that their research with cardiac patients has been with people who ostensibly recover. However, they found that pessimistic women who have had breast cancer, though perhaps successfully treated, continued to use avoidant strategies. They speculated that the continued fear of recurrence and its concomitant threat of death leaves its impression on pessimistic women. Although their findings are divergent
with those of the present study, the similarity resides in the fact that people with long-term medical concerns, like the AICD patients, seem to cope differently, in relation to their level of optimism, than do those who recover physically and emotionally.

Overall, coping strategies did not have anticipated effects in this study. As noted above, many studies have found optimism to have positive correlations with active (or problem-focused) coping and negative associations with avoidance coping (Scheier & Carver, 1992). Zero-order correlations in the present study showed only a mild relationship between optimism and positive emotion-focused coping. Further, none of the three types of coping predicted psychological or physical adjustment in these subjects. Several explanations for this lack of effect are possible. First, problems may lie within the COPE as a measurement tool. It is a theoretically derived instrument developed to assess many specific types of coping styles and strategies (Carver et al., 1989). The instrument remains relatively untested as to whether these coping strategies are valid in predicting outcomes. For the present study, an exploratory factor analysis on the 15 coping scale scores was conducted in an attempt to differentiate meaningful coping strategies. Perhaps, factor analyzing items would have provided better construct validity, but the number of subjects in this study precluded this approach.
Second, the COPE instrument can be administered in two formats, as a situational measure of coping or a dispositional measure. As demonstrated in Carver and colleagues (1989), endorsed coping strategies depend on the administration format. For the present study, the situational approach was used to assess specific coping to the subjects' AICD device. One can speculate that the use of the dispositional procedure, which would have been similar to the specificity level of the other measures (i.e., optimism, neuroticism), might have had a very different outcome.

In relation to the specificity contention, several subjects in this study indicated difficulty in designating a truly stressful situation with their AICD. Some subjects failed to respond, whereas others were vague in their descriptions. Thus, the COPE in this study may have measured a combination of situational and dispositional coping, resulting in poor consistency across subjects.

Although none of the coping variables or their interaction terms with optimism contributed unique variance to the equations with GSI or PSDI as dependent variables, the fact that neuroticism and optimism yielded conflicting results may be related to mediation by coping. Given that repressing or augmenting distress is a form of coping and that optimists are less likely to augment their distress, it is possible that optimism through some unmeasured form of
coping leads to less psychological distress. Perhaps optimists repress, deny, or actively cope with psychological problems, which leads to improved adjustment. The GSI, however, as a more global measure of distress without any specific implications for coping, may be most sensitive to negative affectivity.

Another variable that did not contribute anticipated results was hostility. As measured by the Ho Scale, this construct was mildly to moderately correlated to most of the other dispositional psychological variables. Hostility was, however, substantially unrelated to any health-related or specific cardiac-functioning variables. Such findings run counter to the well-founded claim that hostility predicts cardiac health. The problem may not lie with the construct but with the instrument, which is, unfortunately, the best instrument to measure hostility at this time (Smith, 1992). As reviewed by Smith, the Ho Scale has been inconsistent in its association with health outcomes. One reason is that it is not a homogeneous instrument, but is made up of at least two factors, cynicism and paranoid ideation. Barefoot and colleagues (1989) found six subsets of hostility, with a portion of those subsets predicting better than the total Ho score. Such refined analysis may yield different results in the current study. However, because of the large number of variables of interest and the common usage of the total Ho score, the scale was not divided into these components.
Optimism vs. Neuroticism

Past research has contended that optimism and neuroticism are virtually indistinguishable, as measured by the LOT and Trait Anxiety Scale, respectively (Smith et al., 1989). It was further argued by Scheier and Carver (1992) that optimism is a component of the more general concept of neuroticism and adds its own unique variance to the prediction of outcome. The results of the present study continue the controversy because of inconsistency across the outcome variables.

First, consider the zero-order correlation between optimism and neuroticism. Smith and colleagues (1989) found correlations of -.61 and -.66 in two samples of college students. In the present study of unhealthy subjects, this correlation was -.57. Although slightly lower, these correlations are fairly similar, and suggest that the two constructs share a large amount of variance in common but say little about which one might be the overriding or superordinate construct.

The stepwise multiple regression technique helps to make this hierarchical determination by distinguishing the amount of significant unique variance accounted for by the variables in question. In the present study, neuroticism was clearly a potent variable. Disregarding the findings with life satisfaction as a dependent variable, because of measurement overlap, neuroticism subsumed optimism.
completely in predicting global psychological distress and health perception. In contrast, optimism was a more prominent contributor of unique variance in a more specific measure of psychological distress and, in conjunction with avoidance coping, the proportion of discharges. Neuroticism added a smaller significant amount of variance over and above that of optimism. Together, these findings suggest that optimism and neuroticism, although having an extensive amount of variance in common, are not entirely the same variable and depend markedly on the outcome variable. Recent research may assist in explaining these conclusions.

In a study of optimism, neuroticism, and extraversion, Marshall and colleagues (1992) found that the Life Orientation Test (LOT) is a better measure of two related but distinct factors, optimism and pessimism, than a single optimism construct. Further, the two factors correlated differently with neuroticism and extraversion, where optimism was related to extraversion and pessimism to neuroticism. In this regard, LOT data in the current study were split into an optimism factor and a pessimism factor (which intercorrelated at $r = -.55$). Neuroticism correlated more highly with pessimism ($r = .56$) than optimism ($r = -.44$), consistent with the findings of Marshall and colleagues. There was no measure of extraversion in the present study.
Thus, the divergent results in this study might in fact be attributable to unassessed latent factors. With only part of such factors manifested, it is difficult to conclude whether optimism and neuroticism are a unipolar construct. It seems more likely that a multidimensional and multiscale system would yield more precise explanatory power in health outcomes. Indeed, the need for multidimensional research strategies was further substantiated by the fact that multiple variables and variable interactions significantly predicted the objective health measurement of proportion of discharges.

Characteristics of the AICD Patient

Two considerations will be discussed in this section: adjustment to the AICD device and the health outcomes of the subjects. First, although formal validity studies of the AICD Questionnaire have not been conducted, significant moderate correlations of the total score with established measures of psychological adjustment, physical functioning, and health perception suggest concurrent validity. The total score was also highly correlated with neuroticism and life satisfaction. The magnitudes of these correlations were similar to those of the two latter variables with other measures of psychological adjustment. Thus, preliminary
results suggest that the AICD Questionnaire is a viable measure of specific adjustment to the implant.

Accordingly, as a group, subjects appeared to be adjusting well to their implants. The single area of some concern was in relation to sexual activity. The patients admitted reluctance to engage in sexual behavior since their implantation, perhaps related to fears of triggering a shock. However, most subjects did not admit to fear of being shocked or fear of not being shocked. This finding runs counter to other research, where fear of being shocked was of major concern (Cooper et al., 1986; Pycha & Calabrese, 1990). As an incidental analysis in the present study, whether or not the subjects had received a shock did not differentiate between any of the item scores or total score on the AICD Questionnaire. Additionally, positive adjustment may be a reflection of the presurgery preparation and post-implant attention of the medical staff involved in these patients' care.

Analysis of the cardiac nurse ratings revealed an interesting pattern of results. The compliance rating tended to be correlated with many variables in the opposite direction from the other rating items (e.g., health, coping, mental status). Thus, compliance increased as optimism decreased, life satisfaction decreased, number of MIs increased, and proportion of discharges increased. Perhaps as a means to reduce further incidence of AICD shocks these
patients followed treatment regimens more compliantly. Although pessimism leads to greater compliance, this increased compliance associated with proportion of discharges does not appear to be a direct result of optimistic expectations. Further analysis demonstrated that optimism was not different between those who have and have not experienced a spontaneous discharge, nor did optimism covary with compliance in the two groups. Consequently, health deterioration itself appears to be related to more reliance on medical assistance in this sample.

Finally, prior research (Dalack & Roose, 1990) has suggested that the impact of affectivity on cardiac functioning in these subjects is of paramount importance. Because sudden cardiac death occurs more frequently among depressed patients, the researchers suggested that depression leads to decreased parasympathetic activity, resulting in greater incidence of ventricular fibrillation. This concern is supported in the current study by the finding that the interaction of optimism and avoidance coping, neuroticism, and health perception predicted significant amounts of variance in the proportion of discharges. Such a finding has direct implications for intervention with these patients. Perhaps interventions geared toward increasing positive expectations, cultivating more adaptive coping skills, and alleviating negative
The second major design flaw was the retrospective nature of the study. Attempts to predict outcome retrospectively may limit the potency of the predictor variables. Thus, the conclusions may be "watered down," resulting in Type II error. Further, the psychological traits may not be stable over time when health is changing.
or shocks have been experienced. However, stability in trait anxiety post-implant was observed in one study with AICD patients (Vlay et al., 1989).

Another source of bias may have occurred because the questionnaires were mailed to subjects to complete. Some missing data and immediate clarifications could have been rectified with supervised completion of the questionnaires. Also, uncontrolled assistance by spouses or other family members might have influenced subject responses, in spite of directions to complete them on their own. This problem, however, was unavoidable because of the geographic spread of the subjects. Similarly, subjects' responses to these questionnaires could potentially be biased by the fact that they were aware that their AICD adjustment was under study. Because of ethical concerns, this information must be provided to subjects. However, the researcher must take into account the possibility that subjects may either limit or accentuate the severity of their ratings.

Because many of the subjects in this study were elderly, they were likely to have several severe medical conditions. These ailments were unavailable to the researcher, but may have contributed to poorer health in addition to their cardiac disease.

Finally, two important pieces of data were unavailable for a number of subjects. These were ejection fraction and cardiac medications. In the case of ejection fractions, it
was either not assessed or not recorded for some subjects. Although presumed to be normal for the majority of subjects for which it was missing, without actual data this measure of cardiac performance could not be used. Similarly, a list of cardiac medications was not available for all subjects because several physicians in different facilities may have been involved in the case. Thus, patient records were not up-to-date with these data. To rectify this problem, each subject's primary care nurse was asked to assess the extent of cardiac medication to the best of her knowledge. Whether this assessment is a valid estimate is unknown; therefore, the measure was not used. Without the ability to evaluate the impact of these two important measures of cardiac functioning, this study is limited. Medication, in particular, may have explained a large portion of the proportion of discharges. In addition to numerous cardiac and other medications, several of the subjects were prescribed anti-arrythmia medication to assist in the control of irregular cardiac performance. Such medication is likely to reduce the number of discharges rendered by the AICD.
Recommendations for Future Research

To most effectively measure health outcomes in this patient population, a prospective design with assessment prior to implant and follow-up at several stages post-implant is recommended. This design would be similar to that used by Scheier and colleagues (1989) in their study of CABG patients. The prospective approach has several advantages. The researcher would be able to predict health outcomes, number of shocks, and psychological adjustment, while controlling for stability of psychological traits. Also, the researcher can more effectively obtain all necessary data by assuring that examinations are completed and records are up-to-date.

In addition, the recommendations of Marshall and colleagues (1992) should be followed. They recommended that to best way to determine overlap and distinction between optimism, pessimism, neuroticism, and extraversion (along with other possible latent variables) is to use multidimensional scales. Several measures of different aspects of the constructs should be used. Combining a prospective approach with actual medical patients (rather than college students' lists of physical complaints) and the multidimensional/multiscale method ought to augment the understanding of control theory and behavioral self-regulation tremendously.
The multidimensional/multiscale method might help to deal with the problems of instrumentation. Anastasi (1982) has recommended a multitrait-multimethod approach to determine convergent and discriminant validity of theoretical concepts. Such an approach is befitting the research questions involving optimism, pessimism, neuroticism, and extraversion. Marshall and colleagues (1992) listed several available measures of these constructs. The issues with measurement of hostility described in Smith (1992) also may be resolved with this method.

One goal of research with AICD patients is to assist them in adjusting to life changes brought about by the implant. With that in mind, family response to the implant is in need of further understanding. Family support plays a major role in recovering from and adjusting to chronic health problems (Morris et al., 1991). Thus, research toward understanding where family members can and do impact the patient ought to be conducted.

Finally, another area of research should focus on comparing this unique population of patients to other more established similar populations, such as pacemaker patients or heart transplant patients. Questions of differences in adjustment, recovery, and outcome would help to refine psychological intervention requirements of the AICD patients. Additionally, control theory and behavioral self-
regulation differences between types of patients should be examined, especially if such differences have implications for coping.

Conclusions

In summary, the findings of this study were diverse. Although the results did not simplify the dissension about optimism and neuroticism, the study demonstrated that both variables were meaningful in predicting outcome in this medical population. Their meaning appears to be dependent on the outcome variable measured. Thus, neuroticism was more predictive of general psychological distress, whereas optimism predicted the majority of variance in the "style" with which subjects approach the assessment of distress. Similarly, neuroticism predicted health perception, but optimism, interacting with avoidance coping, predicted the majority of unique variance in the proportion of discharges. From a theoretical perspective, therefore, optimism is clearly a distinct and influential construct.

Further, coping does appear to mediate optimism in predicting outcome, in some instances. In this study, those subjects who were pessimistic and did not use avoidance coping were significantly more likely to have received a greater number of AICD discharges. This type of interaction has not been demonstrated in previous studies.
The other purpose of this study was to examine more thoroughly the psychological and behavioral profile of the AICD patients. The voluntary subjects in this study were found to be in greater psychological distress and to perceive themselves as less physically healthy than respective normative groups. The majority were adjusting well to their implants, but were concerned about engaging in sexual activity. Further, subjects who were more troubled by psychological or physical problems tended to be more compliant with treatment, as rated by the nursing staff. The findings also suggested that interventions geared toward increasing positive expectations, adaptive coping strategies, and psychological health will lead to decreased incidence of AICD discharge.

Finally, recommendations for future research with this population include emphasis on prospective investigation using the multidimensional/multiscale method to incorporate several important aspects of optimism. Additionally, the importance of family support in recovery and adjustment to chronic health problems suggests that further study of family response to the implant would be worthwhile to continue to understand these patients' adjustment.
REFERENCES


APPENDICES
APPENDIX A

LIFE ORIENTATION TEST
LIFE ORIENTATION TEST

Subject # ____________________________

INSTRUCTIONS: Please indicate the extent to which you agree with each of the following statements by marking the number that best describes your attitude. Be as accurate and honest as you can throughout the items, and try not to let your answers to one question influence your answers to others. Answer according to your own feelings, rather than how you think "most people" would answer. There are no correct or incorrect answers.

MARK:

0 - STRONGLY DISAGREE
1 - DISAGREE
2 - NEUTRAL
3 - AGREE
4 - STRONGLY AGREE

____ 1. In uncertain times, I usually expect the best.
____ 2. It's easy for me to relax.
____ 3. If something can go wrong for me, it will.
____ 4. I always look on the bright side of things.
____ 5. I'm always optimistic about my future.
____ 6. I enjoy my friends a lot.
____ 7. It's important for me to keep busy.
____ 8. I hardly ever expect things to go my way.
____ 9. Things never work out the way I want them to.
____ 10. I don't get upset too easily.
____ 11. I'm a believer in the idea that "every cloud has a silver lining."
____ 12. I rarely count on good things happening to me.
APPENDIX B

TRAIT ANXIETY SCALE
TRAIT ANXIETY SCALE

Subject #: ________________________

DIRECTIONS: A number of statements that people have used to describe themselves are given below. Read each statement and then circle the appropriate number to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

<table>
<thead>
<tr>
<th></th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am a steady person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel satisfied with myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I feel nervous and restless.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I wish I could be as happy as others seem to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I feel like a failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I get in a state of tension or turmoil as I think over my recent concerns and interests.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I feel secure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I lack self-confidence.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I feel inadequate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I worry too much over something that really does not matter.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX C

COPE
COPE

INSTRUCTIONS: We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you did and felt, when you experienced a recent stressful event. Obviously, different events bring out somewhat different responses, but think about what you did when you were under a lot of stress.

Please write on the lines below the most recent stressful event that has occurred in relation to your AICD implant.

Now, respond to each of the following items by writing one number next to each statement using the response choices listed just below. Remember to choose your response based on the extent to which you used that item in the situation you have just described. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true for you as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for you—not what you think "most people" would say or do. Indicate what you did when you experienced this stressful event.

1 = I didn't do this at all.
2 = I did this a little bit.
3 = I did this a medium amount.
4 = I did this a lot.

1. I tried to grow as a person as a result of the experience.
2. I turned to work or other substitute activities to take my mind off things.
3. I got upset and let my emotions out.
4. I tried to get advice from someone about what to do.
5. I concentrated my efforts on doing something about it.
1 = I didn't do this at all.
2 = I did this a little bit.
3 = I did this a medium amount.
4 = I did this a lot.

6. I said to myself "this isn't real."
7. I put my trust in God.
8. I laughed about the situation.
9. I admitted to myself that I couldn't deal with it, and quit trying.
10. I restrained myself from doing anything too quickly.
11. I discussed my feelings with someone.
12. I used alcohol or drugs to make myself feel better.
13. I got used to the idea that it happened.
14. I talked to someone to find out more about the situation.
15. I kept myself from getting distracted by other thoughts or activities.
16. I daydreamed about things other than this.
17. I got upset, and was really aware of it.
18. I sought God's help.
19. I made a plan of action.
20. I made jokes about it.
21. I accepted that this had happened and that it couldn't be changed.
22. I held off doing anything about it until the situation permitted.
23. I tried to get emotional support from friends and relatives.
24. I just gave up trying to reach my goal.
1 = I didn't do this at all.
2 = I did this a little bit.
3 = I did this a medium amount.
4 = I did this a lot.

25. I took additional action to try to get rid of the problem.
26. I tried to lose myself for a while by drinking alcohol or taking drugs.
27. I refused to believe that it had happened.
28. I let my feelings out.
29. I tried to see it in a different light, to make it seem more positive.
30. I talked to someone who could do something concrete about the problem.
31. I slept more than usual.
32. I tried to come up with a strategy about what to do.
33. I focussed on dealing with this problem, and let other things slide a little.
34. I got sympathy and understanding from someone.
35. I drank alcohol or took drugs, in order to think about it less.
36. I kidded around about it.
37. I gave up the attempt to get what I wanted.
38. I looked for something good in what was happening.
39. I thought about how I might best handle the problem.
40. I pretended that it hadn't really happened.
41. I made sure not to make matters worse by acting too soon.
42. I tried hard to prevent other things from interfering with my efforts at dealing with this.
43. I went to movies or watched TV, to think less about it.

44. I accepted the reality of the fact that it happened.

45. I asked people who have had similar experiences what they did.

46. I felt a lot of emotional distress and I found myself expressing those feelings a lot.

47. I took direct action to get around the problem.

48. I tried to find comfort in my religion.

49. I forced myself to wait for the right time to do something.

50. I made fun of the situation.

51. I reduced the amount of effort I put into solving the problem.

52. I talked to someone about how I felt.

53. I used alcohol or drugs to help me get through it.

54. I learned to live with it.

55. I put aside other activities in order to concentrate on the problem.

56. I thought hard about what steps to take.

57. I acted as though it hadn't even happened.

58. I did what had to be done, one step at a time.

59. I learned something from the experience.

60. I prayed more than usual.
APPENDIX D

HO SCALE
HO SCALE

Subject #: ________________________________

INSTRUCTIONS: Read each statement below and decide whether it is true as applied to you or false as applied to you. If a statement is true or mostly true, as applied to you, circle the T. If a statement is false or not usually true, as applied to you, circle the F. Remember to give your own opinion of yourself.

T  F  1. When I take a new job, I like to be tipped off on who should be gotten next to.

T  F  2. When someone does me a wrong I feel I should pay him back if I can, just for the principle of the thing.

T  F  3. I prefer to pass by school friends, or people I know but have not seen for a long time, unless they speak to me first.

T  F  4. I have often had to take orders from someone who did not know as much as I did.

T  F  5. I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.

T  F  6. It takes a lot of argument to convince most people of the truth.

T  F  7. I think most people would lie to get ahead.

T  F  8. Someone has it in for me.

T  F  9. Most people are honest chiefly through fear of being caught.

T  F  10. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.

T  F  11. I commonly wonder what hidden reason another person may have for doing something nice for me.

T  F  12. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.

T  F  13. I feel that I have often been punished without cause.

T  F  14. I am against giving money to beggars.

T  F  15. Some of my family have habits that bother and annoy me very much.
T  F  16. My relatives are nearly all in sympathy with me.
T  F  17. My way of doing things is apt to be misunderstood by others.
T  F  18. I don't blame anyone for trying to grab everything he can get in this world.
T  F  19. No one cares much what happens to you.
T  F  20. I can be friendly with people who do things which I consider wrong.
T  F  21. It is safer to trust nobody.
T  F  22. I do not blame a person for taking advantage of someone who lays himself open to it.
T  F  23. I have often felt that strangers were looking at me critically.
T  F  24. Most people make friends because friends are likely to be useful to them.
T  F  25. I am sure I am being talked about.
T  F  26. I am likely not to speak to people until they speak to me.
T  F  27. Most people inwardly dislike putting themselves out to help other people.
T  F  28. I tend to be on my guard with people who are somewhat more friendly than I had expected.
T  F  29. I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards.
T  F  30. People often disappoint me.
T  F  31. I like to keep people guessing what I'm going to do next.
T  F  32. I frequently ask people for advice.
T  F  33. I am not easily angered.
T  F  34. I have often met people who were supposed to be experts who were no better than I.
T  F  35. I would certainly enjoy beating a crook at his own game.
T  F  36. I makes me feel like a failure when I hear of the success of someone I know well.
T F 37. I have at times had to be rough with people who were rude or annoying.

T F 38. People generally demand more respect for their own rights than they are willing to allow for others.

T F 39. There are certain people whom I dislike so much that I am inwardly pleased when they are catching it for something they have done.

T F 40. I am often inclined to go out of my way to win a point with someone who has opposed me.

T F 41. I am quite often not in on the gossip and talk of the group I belong to.

T F 42. The man who had most to do with me when I was a child (such as my father, step-father, etc.) was very strict with me.

T F 43. I have often found people jealous of my good ideas, just because they had not thought of them first.

T F 44. When a man is with a woman he is usually thinking about things related to her sex.

T F 45. I do not try to cover up my poor opinion or pity of a person so that he won't know how I feel.

T F 46. I have frequently worked under people who seem to have things arranged so that they get credit for good work but are able to pass off mistakes onto those under them.

T F 47. I strongly defend my own opinions as a rule.

T F 48. People can pretty easily change me even though I thought that my mind was already made up on a subject.

T F 49. Sometimes I am sure that other people can tell what I am thinking.

T F 50. A large number of people are guilty of bad sexual conduct.
APPENDIX E

SHORT-FORM HEALTH SURVEY
SHORT-FORM HEALTH SURVEY

Subject #: _________________________

1. In general, would you say your health is:
   a. Excellent
   b. Very Good
   c. Good
   d. Fair
   e. Poor

2. How much bodily pain have you had during the past 4 weeks?
   a. None
   b. Very Mild
   c. Mild
   d. Moderate
   e. Severe

3. For how long (if at all) has your health limited you in each of the following activities? (Circle one number on each line.)

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Not limited</th>
<th>Limited for 1 month</th>
<th>Limited for 2 months</th>
<th>Limited for 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>b. The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>c. Walking uphill or climbing a few flights of stairs</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>d. Bending, lifting, or stooping</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>e. Walking one block</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>f. Eating, dressing, bathing or using the toilet</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
For each of the following questions, please circle the number for the one answer that comes closest to the way you have been feeling during the past month.

<table>
<thead>
<tr>
<th>A Good</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the Time</td>
<td>Most of the Time</td>
<td>Bit of the Time</td>
<td>Some of the Time</td>
<td>Little None of the Time</td>
<td>None of the Time</td>
</tr>
</tbody>
</table>

4. How much of the time, during the past month, has your health limited your social activities (like visiting with friends or close relatives)? ......... 1 2 3 4 5 6

5. How much of the time, during the past month, have you been a very nervous person? ......... 1 2 3 4 5 6

6. During the past month, how much of the time have you felt calm and peaceful? ......... 1 2 3 4 5 6

7. How much of the time, during the past month, have you felt down-hearted and blue? ......... 1 2 3 4 5 6

8. During the past month, how much of the time have you been a happy person? ......... 1 2 3 4 5 6

9. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up? ......... 1 2 3 4 5 6

10. Does your health keep you from working at a job, doing work around the house or going to school?

   a. Yes, for more than 3 months
   b. Yes, for 3 months or less
   c. No
11. Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health?
   a. Yes, for more than 3 months
   b. Yes, for 3 months or less
   c. No

12. Please circle the number that best describes whether each of the following statements is true or false for you.

<table>
<thead>
<tr>
<th></th>
<th>Definitely True</th>
<th>Mostly True</th>
<th>Not Sure</th>
<th>Mostly False</th>
<th>Definitely False</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I am somewhat ill</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. I am as healthy as anybody I know</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. My health is excellent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. I have been feeling bad lately</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13. How often do you exercise on a regular basis?
   a. More than once a day
   b. Once a day
   c. Three times a week
   d. One time a week
   e. Less than twice a month
   f. I do not exercise.

14. If you do exercise, what do you do and for how long each time?

15. How many cigarettes do you smoke?
   a. None
   b. Less than one cigarette a week
   c. One or two cigarettes a day
   d. A pack a day
   e. Two packs or more a day
16. Please indicate if you use any of the following tobacco products and how much of each per day.

   a. Pipe tobacco ________
   b. Cigars ________
   c. Chew ________
   d. Snuff ________

17. Please indicate the extent to which you feel you are or have been told by a doctor that you are overweight.

   a. I am just about the right weight
   b. I am 10 to 15 pounds overweight
   c. I am 16 to 25 pounds overweight
   d. I am 26 to 50 pounds overweight
   e. I am 51 to 100 pounds overweight
   f. I am greater than 100 pounds overweight

18. How often do you try to eat a low fat meal?

   a. Three or more times per day
   b. Once or twice per day
   c. Five or six times per week
   d. Once or twice per week
   e. Less than once per week

19. How often do you try to eat low fat snacks?

   a. All of my snacks are low fat
   b. Most of my snacks are low fat
   c. Some of my snacks are low fat
   d. Very few of my snacks are low fat
   e. I do not usually eat snacks

20. Do you follow your doctor's recommendations for a well-balanced, low-fat diet?

   a. Yes
   b. No
APPENDIX F

AICD QUESTIONNAIRE
AICD QUESTIONNAIRE

Subject # __________________________

INSTRUCTIONS: For each question below circle which response you most agree with.

1. Since the implantation of your automatic implantable cardioverter defibrillator (AICD), has your general sense of well-being:
   a. significantly worsened
   b. somewhat worsened
   c. remained the same
   d. somewhat improved
   e. significantly improved

2. If confronted today with the decision of implanting an AICD, how would you decide?
   a. I would decide in favor of having the AICD implanted.
   b. I would decide against having the AICD implanted.
   c. I am not sure what I would do.

3. Would you advise another patient to undergo AICD implantation?
   a. Yes
   b. No
   c. I am not sure

4. How have your feelings about your life expectancy been affected as a direct result of your AICD?
   a. I feel significantly more concerned about my life expectancy.
   b. I feel somewhat more concerned about my life expectancy.
   c. I feel the same about my life expectancy.
   d. I feel somewhat more optimistic about my life expectancy.
   e. I feel significantly more optimistic about my life expectancy.
5. To what extent do you feel anxious as a direct result of your experiences with your AICD?
   a. I feel significantly more anxious.
   b. I feel somewhat more anxious.
   c. I feel as anxious as before I had the AICD implanted.
   d. I feel somewhat less anxious.
   e. I feel significantly less anxious.

6. To what extent do you feel angry as a direct result of your experiences with your AICD?
   a. I feel significantly more angry.
   b. I feel somewhat more angry.
   c. I feel neither more or less angry than I did before I had the AICD implanted.
   d. I feel somewhat less angry.
   e. I feel significantly less angry.

7. To what extent do you feel that your mood has been affected as a result of your experiences with your AICD?
   a. I feel significantly more depressed.
   b. I feel somewhat more depressed.
   c. I feel that I am no more or less depressed.
   d. I feel somewhat less depressed.
   e. I feel significantly less depressed.

8. To what extent are you concerned about changes in your physical appearance caused by your AICD?
   a. I am significantly more concerned.
   b. I am somewhat more concerned.
   c. I am neither more or less concerned.
   d. I am somewhat less concerned.
   e. I am significantly less concerned.

9. To what extent has your fears about your AICD affected your sex life?
   a. I am significantly less likely to engage in sexual behavior.
   b. I am somewhat less likely to engage in sexual behavior.
   c. My sex life has not changed.
   d. I am somewhat more likely to engage in sexual behavior.
   e. I am significantly more likely to engage in sexual behavior.
10. Have you ever been shocked by your AICD outside of the hospital?

   a. No
   b. Yes (about how many times? ________)

11. To what extent do you feel fearful of being shocked in the future?

   a. I am extremely fearful.
   b. I am quite fearful.
   c. I am somewhat fearful.
   d. I am slightly fearful.
   e. I am not fearful at all.

12. To what extent do you feel fearful that your AICD will NOT work when it is needed?

   a. I am extremely fearful.
   b. I am quite fearful.
   c. I am somewhat fearful.
   d. I am slightly fearful.
   e. I am not fearful at all.

13. Prior to the implantation of your AICD were you ever treated with medication to calm your nerves or treat depression?

   a. Yes
   b. No

   If you answered YES to this question, please state the name(s) of the medication(s) and how long you had been using the medication(s).

<table>
<thead>
<tr>
<th>NAMES OF MEDICATION(S)</th>
<th>LENGTH OF TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
14. Have you taken any medications to calm your nerves or treat depression since receiving your AICD?

a. Yes
b. No

If you answered YES to this question, please state the name(s) of the medication(s) and how long you had been using the medication(s).

<table>
<thead>
<tr>
<th>NAMES OF MEDICATION(S)</th>
<th>LENGTH OF TIME</th>
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<tr>
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</tbody>
</table>

15. In the space below and on the back of this page, we would appreciate any other comments you may have about your experience with your AICD.
DEMOGRAPHIC QUESTIONNAIRE

Subject # ______________________

Please answer each of the following questions by either circling or filling in the blanks as appropriate. All of this information will remain confidential, and all questions are optional. If you choose not to respond to any of the questions it will not affect the rest of the study.

1. What is your age? _____  Sex? ________  Race? ________

2. What would you consider to be the current socioeconomic status of your family?
   Lower  Lower Middle  Middle  Upper Middle  Upper

3. Are you retired or employed? ______________________

4. What do you do for a living (if you are retired what did you used to do)?
   ______________________

5. What is your current marital status?
   ______________________

6. If you are currently married or have been married before, how many times have you been married total? ______________________

7. How many children do you have? ______________________

8. What type of community do you live in?
   a. urban  b. suburban  c. rural

9. What is your current yearly family income?
   a. $  0 - $ 5,000  
   b. $ 5,001 - $10,000  
   c. $10,001 - $20,000  
   d. $20,001 - $30,000  
   e. $30,001 - $40,000  
   f. $40,000+

10. What was your last year completed in school?
    6 7 8 9 10 11 12  Technical/Trade School: ______________________
        College: Freshman  Sophomore  Junior  Senior
        Graduate School: Masters  Doctorate  MD  Other________
APPENDIX H

CARDIAC NURSE RATINGS
CARDIAC NURSE RATINGS

Subject # _______________________
Rater: _______________________
Date: _______________________

INSTRUCTIONS: Please rate the above named patient in each of the following categories by circling the letter you believe best fits.

1. How would you rate this patient's overall physical health?
   a. Excellent.
   b. Good.
   c. Poor.

2. Please rate the patient's adaptation or coping to his or her AICD.
   a. Excellent.
   b. Good.
   c. Poor.

3. Please rate the patient's compliance with treatment recommendations.
   a. Very compliant.
   b. Generally compliant; could be better.
   c. Not very compliant; somewhat of a problem.

4. What would you consider to be this patient's overall mental status?
   a. Poor.
   b. Good.
   c. Excellent.

5. What is your general reaction towards this patient when he or she contacts you?
   a. Generally positive; my interactions with this person are quite enjoyable.
   b. Generally neutral; my interactions with this person are okay.
   c. Generally negative; my interactions with this person are quite unpleasant.
APPENDIX I

INFORMED CONSENT LETTER
INFORMED CONSENT LETTER

Dear AICD Patient:

You are invited to participate in a research study examining several psychological and behavioral aspects surrounding your implant. This study is supported by the staff of the AICD project. Your participation in this study is voluntary. You may refuse to participate or withdraw from the study at any time without any effect on your present or future treatment at Hermann Hospital. This research study, HSC-MS-92-052, has been reviewed and approved by the Committee for the Protection of Human Subjects, University of Texas Health Science Center at Houston.

The purpose of this study is to examine the impact that the AICD device has on your physical, mental and social well-being. As we learn more about how your implant affects your life, we can offer more specific assistance to you as you adjust to the device. All of the patients who have received the device from Hermann Hospital will be invited to take part in the research study. If you agree to participate, several questionnaires will be mailed to you. The questionnaires will ask you to respond to questions about attitudes, physical and emotional distress, and coping styles. It is expected that the questionnaires will take a total of about two hours to complete. After you have completed them, you will mail them back to the researcher in a self-addressed, stamped envelope provided for you. Also, information about your physical progress and difficulty will be collected from your medical records, including when you received your implant and the number of times it has discharged.

Part of the benefits of this study will be to indicate what types of topics might be presented at the AICD support group at Hermann Hospital. Additionally, this study will provide us with information about how to assist future patients in adjusting to the implant. Please keep in mind that the information that you provide will be kept in strict confidence. Your research records will be identified by a study code number, without your name or other identifying information. Also, some people find that answering questions about feelings or personal information may cause them to feel slightly uncomfortable. If you should feel this way about any question, you may skip that question or call the researcher.
Enclosed with this letter you will find an addressed, stamped card. If you agree to participate in this study please sign and print your name on this card. When the signed card is received by the researcher, Paul Damin, you will be sent a packet of questionnaires. Upon completion of the questionnaires you will return them to the researcher by mail. When the study is concluded, a summary of the research findings will be sent to you. Any questions about the study that arise during your participation can be answered by Paul Damin at (713) 794-4020.

Thank you for considering to participate in this research study. We hope to receive the return card from you soon.

Sincerely yours,

Paul B. Damin, MS
Principal Investigator

Gerald Naccarelli, MD
Professor of Medicine
Director, Clinical Electrophysiology
Division of Cardiology Vice-Chairman, Hermann Hospital
CURRICULUM VITAE

PAUL B. DAMIN

3131 Timmons Lane
Apt. #140
Houston, TX 77027
(713) 840-7957

EDUCATION

Ph.D. Candidate: Utah State University, Logan, UT. Dual Major in APA Accredited Combined Professional-Scientific Psychology (Clinical Emphasis) and Research and Evaluation Methodology. Expected graduation date: December, 1993.


DISSERTATION

The Significance of Dispositional Optimism and Coping in Predicting Psychological Distress, Life Satisfaction, Health Perception and Frequency of Discharges in the Automatic Implantable Cardioverter Defibrillator (AICD) Patient.

CURRENT EMPLOYMENT

PSYCHOTHERAPIST AND PSYCHOLOGICAL EXAMINER
Nicholas Edd, PsyD
11767 Katy Freeway, Suite 370
Houston, TX 77079

9/92 to Present

Responsibilities: Conducting inpatient and outpatient individual and family psychotherapy and psychological assessments with children, adolescents and adults.

GROUP PSYCHOTHERAPIST
Joseph Peraino, PhD
3555 Timmons Lane, Suite 1280
Houston, TX 77027

4/93 to Present

Responsibilities: Conducting sex offender psychotherapy groups with adult parolees.
POST-DOCTORAL FELLOWSHIP

CLINICAL PSYCHOLOGY FELLOW
University of Texas Health Science Center - Houston
Mental Sciences Institute
1300 Moursund St.
Houston, TX 77030

9/91 to 8/92

Responsibilities: Three days devoted to General Adult Outpatient Clinic providing psychotherapy, as well as consultation for weekly intake team. Remainder of time devoted to research and specialty area experience. Research topics include continuation of data collection for doctoral dissertation, relapse prevention treatment for substance abusers, frustration tolerance in recovering alcoholics and substance abusers, and replacement drug treatment for cocaine abusers. Specialty area is in the domain of substance abuse treatment and investigation.

PRE-DOCTORAL INTERNSHIP

PSYCHOLOGY INTERN
Perry Point Veterans Administration Medical Center
Perry Point, MD 21902

9/90 to 8/91

APA accredited pre-doctoral internship program.
Rotation 1: 28-day Inpatient Alcoholism Rehabilitation Program
Rotation 2: Acute Inpatient Psychiatry
Rotation 3: 2 days/week Terry Children's Psychiatric Center
            3 days/week Inpatient Chemical Dependency Rehabilitation Program

Responsibilities: Group, individual, family, marital, and play psychotherapy, individual case management, patient education groups, psychological assessments, and general involvement as a treatment team member. VAMC patient population treated were primarily male veterans and their families, with some female veterans in long-term group psychotherapy. The Terry Children's Psychiatric Center served both an inpatient and outpatient population of children aged 12 years and under, with family outpatient treatment.
CLINICAL EXPERIENCE

GRADUATE ASSISTANT THERAPIST
Bear River Mental Health Services, Inc.
Logan, UT 84321

7/88 to 6/89

Responsibilities: Provided individual, group, couple, and family therapy, as well as crisis intervention. Involved outpatient and inpatient therapeutic experiences and psychological evaluations. Presented cases for staffing. Psychotherapy with children, adolescents, families, couples and adults with a wide variety of presenting problems and DSM III-R diagnoses. Co-lead adolescent social skills therapy group. Used theoretical orientations of psychodynamic, cognitive, Gestalt, and behavioral.

CLINICAL PRACTICUM THERAPIST
Utah State University Community Psychology Clinic
Department of Psychology
Logan, UT

9/86 to 8/90

Responsibilities: Provided outpatient individual and couples therapy, with acute inpatient therapy for patients in crisis. Co-lead short-term (20 weeks) outpatient adult therapy group. Conducted intake interviews and psychological assessments for adults, adolescents and children. Psychotherapy with adults with a wide variety of presenting problems and DSM III-R diagnoses. Used theoretical orientations of psychodynamic, Gestalt, transactional analysis, cognitive, behavioral. Presented cases to practicum group and individual supervisor, including videotape samples of work and explanations of theoretical orientation used.

COUNSELING PRACTICUM THERAPIST
Parents United
Child and Family Support Center
Logan, UT

1/87 to 6/87

Responsibilities: Co-facilitated group counseling for female adolescent sexual abuse victims involved in a supportive network for child, adolescent, and adult victims and perpetrators. Completed psychological assessment battery on one group member.
CLINICAL EXPERIENCE (CONT'D)

SCHOOL PRACTICUM THERAPIST/DIAGNOSTICIAN
Cache County School District
River Heights, UT

1/88 to 6/88

Responsibilities: Conducted psycho-educational assessment batteries, including interviewing, intellectual and achievement tests, classroom observations, report writing, and presentation of findings at IEP meetings. Provided group counseling for early adolescence communication training and individual therapy for behavior disorders.

RESEARCH AND PROGRAM EVALUATION EXPERIENCE

PROGRAM EVALUATION INTERN
Utah State University
Department of Psychology
Logan, UT

1/88 to 8/90

Responsibilities: Assisted in planning, development and implementation of program evaluation project for undergraduate elementary education teacher training program. Included tasks such as instrument designing and validation, data collection through objective measures and interviewing, and data analyses.

DATA COLLECTOR
The Psychological Corporation
Dallas, TX

1/88 to 8/88

Responsibilities: Tested children for standardization of the Wechsler Primary Preschool Scale of Intelligence-Revised. Ten children tested with WPPSI-R and either a second WPPSI-R or WPPSI. Also administered WPPSI-R Ability Screener.

GRADUATE RESEARCH ASSISTANT
Utah State University
Department of Psychology
Logan, UT

10/86 to 9/87

Responsibilities: Collected, managed and analyzed data for research project involving measurement of asymmetry in brain structure. Supervised undergraduate research assistants in clerical duties related to data management and analysis.
TEACHING EXPERIENCE

GRADUATE TEACHING ASSISTANT
Utah State University
Department of Psychology
Logan, UT

6/89 to 8/90

Responsibilities: Assistant for class in general human development (Psychology 110). Prepared lectures and taught classes, graded tests and papers, consulted with students, and calculated item analyses for tests. Responsible for teaching entire class for three quarters (Winter 1990, Spring 1990, Summer 1990).

INSTRUCTOR
Utah State University
Logan, UT

1/88 to 3/88

Responsibilities: Instructor for Introduction to Counseling and Guidance (Psychology 520). Class was broadcast on university communications network to several off-campus sites.

GRADUATE TEACHING ASSISTANT
University of Bridgeport
Department of Psychology
Bridgeport, CT

9/84 to 5/85

Responsibilities: Assisted psychology professors in test construction and classroom management, and conducted group discussions for introductory psychology students.

RELATED WORK EXPERIENCE

CLINIC ASSISTANT
Utah State University
Community Psychology Clinic
Department of Psychology
Logan, UT

6/87 to 6/88 (Part-time graduate assistantship)

Responsibilities: On-call for crisis work 24 hours daily; responsible for clinic testing materials and audio-video equipment; management of clinic files and computerized databases; and supervised undergraduate research students.
RELATED WORK EXPERIENCE (CONT'D)

SYSTEMS MANAGER
University of Bridgeport
Center for Individualized Instruction
Bridgeport, CT

6/85 to 8/86

Tasks included: Running computer operations of a centralized testing facility utilizing computer-managed instruction, supervising several graduate assistants, conducting discussion groups for introductory psychology students, tutoring undergraduate psychology students, assisting faculty of several departments in using the center.

PUBLICATIONS


PROFESSIONAL PRESENTATIONS


PROFESSIONAL AFFILIATIONS

Student Affiliate, American Psychological Association, December, 1986 to Present.

Membership in Psi Chi National Honor Society, 1982. Inducted while a student at Marist College, Poughkeepsie, NY.