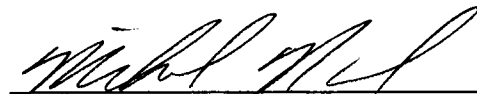
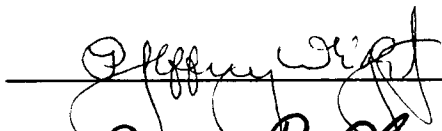


To the Graduate Council:

I am submitting herewith a dissertation written by Jane Guion Tillman entitled "The Relationship Between Alexithymia, Stress, and Coping in Cancer Patients." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Clinical Psychology.


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We have read this dissertation
and recommend its acceptance:


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Accepted for the Council:


Associate Vice Chancellor
and Dean of the Graduate School

THE RELATIONSHIP BETWEEN
ALEXITHYMIA, STRESS, AND COPING IN
CANCER PATIENTS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee,
Knoxville

Jane Guion Tillman

August, 1995

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ABSTRACT

The current study sought to explore the affective sequelae of having a life-threatening illness. The Toronto Alexithymia Scale (Taylor, Ryan, & Bagby, 1985) was used to measure the experience and expression of affect. The Impact of Events Scale (Horowitz, Wilner, & Alvarez, 1979) was used to measure stress related to the event of having cancer. Coping was measured by using the 'fighting spirit' subscale of the Mental Adjustment to Cancer Scale (Watson, Greer, & Bliss, 1989).

Hypotheses about the potential sequelae of having cancer were tested. Findings suggest that patients with advanced cancer do indeed experience a high degree of stress consistent with other populations seeking treatment for stress related syndromes. Other findings suggest that anxiety and depression are significantly related to experienced stress.

The construct of alexithymia was examined and found to be related to stress as well as anxiety. Alexithymia was not significantly related to depression in this study, a finding which differs from previous studies. The variable which best predicts alexithymia was noted to be vigor, which was inversely related to the

construct of alexithymia. Coping as measured by
'fighting spirit' was not found to be significantly
related to alexithymia.

TABLE OF CONTENTS

	PAGE
I. INTRODUCTION	1
Alexithymia	1
The Assessment of Alexithymia:	
History	4
Secondary and Primary Alexithymia ..	14
Stress and Coping	19
Objectives of the Present Study	22
II. METHOD	25
Subjects	25
Materials	27
Procedure	32
Data Analysis	34
III. RESULTS	36
Patient Demographics	36
Characteristics of Measures	41
Tests of Hypotheses	45
Post-Hoc Analysis of Data	53
IV. DISCUSSION	56
Methodological Issues	56
Lack of Significant Change Scores ..	58
Discussion of Hypotheses	61
Implications of the Present Research	70

Summary	74
REFERENCES	77
APPENDICES	
Appendix A Stanford Oncology Questionnaire ..	89
Appendix B Toronto Alexithymia Scale	95
Appendix C Impact of Events Scale	100
Appendix D Mental Adjustment to Cancer Scale	102
Appendix E Hospital Anxiety and Depression Scale	110
Appendix F Medical Information Form	111
Appendix G Abbreviations Used for Variables .	112
VITA	114

LIST OF TABLES

TABLE	PAGE
1. Characteristics of Study Sample	37
2. Current Stage of Disease at Baseline Entry Into Study	38
3. Distribution and Frequency of Type of Cancer by Patient for the Entire Sample of 48 Subjects	39
4. Descriptive Statistics for the TAS, IES, MAC-FS, HADS, BPOMFAT, and BPOMVIG at Baseline and Follow-up	42
5. Correlation Matrix for Alexithymia, Fatigue, vigor, and the Interaction Variable of Fatigue X Vigor	49
6. Correlation Matrix for Alexithymia, Anxiety, Depression, and Stress	51
7. Standardized Multiple Regression Analysis Predicting Alexithymia From Subscale Scores of the HADS, POMS, MAC, and IES	55

CHAPTER I

INTRODUCTION

In the past twenty years, researchers have attempted to examine the relationship between emotions and cancer. In another area, investigators have been interested in examining effects of psychological and physical trauma on psychological functioning. In the current study, cancer has been construed as a potentially stressful life event with emotional sequelae. The present study examines the experience of having cancer on affective expression, stress, and coping. The specific affective construct being examined is alexithymia, a term indicating difficulties with the experience and expression of affect. The relationship between alexithymia and stress is examined to understand more about the concept of secondary alexithymia, a newly developed and poorly understood phenomenon.

Alexithymia

In 1973, Sifneos used the term alexithymia to describe an affective/cognitive personality trait that:

- a) causes a disturbance in the way individuals

experience and express emotion, and b) results in the display of 'la pensee operateire'. This latter term was borrowed from the work of French psychoanalysts Marty and de M'Uzan (1963), who described patients with physical illness who were unable to produce fantasies (Taylor, 1987). Indeed, the term 'la pensee operateire' translated means operative thinking. This type of thinking has variously been described as pragmatic, unimaginative, mundane, and restricted to a narrow interpretation of reality. It is from this early descriptive clinical work and experience with psychosomatic patients that Sifneos coined the term alexithymia as a definition for this collection of symptoms.

The etymology of the word alexithymia is Greek. Simply broken down the word roots mean: a=lack, lexis=word, and thymos = emotions (Hendryx, Haviland, and Shaw, 1991). Theorists expanded and refined the definition of alexithymia to include four features (Nemiah, Freyberger, & Sifneos, 1976). Briefly these are: 1) difficulty identifying and describing feelings; 2) difficulty distinguishing feelings from bodily sensations; 3) reduction or absence of symbolic thinking (or a lack of imaginative ability); and 4) an external,

operative cognitive style. Another hypothesized alexithymic process is that constricted emotional awareness and cognitive processing of affective states leads to a heightening of somatic experience, with affects being experienced somatically (Bagby, Parker, Taylor, 1991a).

Since Sifneos defined the term in the early 1970's the concept has been expanded and redefined in ways that have often complicated and hidden the syndrome. Because of the expansion of what alexithymia includes symptomatically, the attempts to operationalize a changing definition have been extraordinarily difficult. Without a clear construct from which to work, researchers have attempted to measure this wide variety of experience in a host of unsound ways. The early attempts yielded what were supposed to be measures of alexithymia but which failed to meet basic psychometric principles on several fronts: most notably construct validity and internal reliability. Despite these major shortcomings, these invalid instruments were used for over a decade in research seeking to locate the alexithymic characteristic within a number of well circumscribed populations (Taylor & Bagby, 1988).

The Toronto Alexithymia Scale (TAS) (Taylor, Ryan, and Bagby, 1985) was developed to correct the psychometric shortcomings of previous instruments. This instrument was developed using a construct-oriented, factor analytic approach and standard item-selection procedures (Parker, Taylor, Bagby, & Thomas, 1991). Currently, the TAS is considered the "gold standard" of measurement for the construct of alexithymia.

The Assessment of Alexithymia: History

As noted above the assessment of alexithymia has presented several challenges to researchers in this area. Perhaps the most salient difficulty has been the construct itself. Clinicians have long recognized the symptom cluster which defines alexithymia. The etiology of this symptom cluster remains a mystery. Scientists have proposed models for the development of alexithymia out of widely differing perspectives.

The question remains: is alexithymia a pathology of affect or a character neurosis; is it genetic or developmental; is it learned and can it be unlearned; is it neuropsychological? Further questions as to the nature of this dysfunction must be examined, such as state/trait characteristics, relationship to social

class and intelligence, and the connection between alexithymia and somatic illness (Warnes, 1986). In the past twenty years, researchers have examined many of these questions and the answers are not clear for any of them.

This fundamental confusion as to the origins and outcome of alexithymic characteristics renders the assessment procedure enormously difficult. A further confound is that the early research was based on clinical observation of alexithymic styles and the jump to measurement was not carefully planned. The early instruments and interview schedules used to assess alexithymia were psychometrically unsound and neither reliable nor valid (Taylor, Bagby, & Parker, 1991). Despite this egregious error, these instruments were used, and continue to be used in assessing alexithymia. The data resulting from the experiments which utilized invalid instruments is now spurious and ten years of research on alexithymia must be questioned in terms of accuracy.

The three types of assessment procedures that have been used are: 1) observer-rated questionnaires, 2) projective techniques, and 3) self-report measures. The

instruments used are briefly described and potential limitations are reported.

The first instruments used to measure alexithymia were the Beth Israel Hospital Psychosomatic Questionnaire (BIQ), and the Alexithymia Provoked Response Questionnaire (APRQ). Both of these questionnaires are interviewer-rated questionnaires. The BIQ was developed by Sifneos in 1973. This instrument relies on a skilled interviewer to administer and score a structured interview with the patient. The questionnaire is a seventeen item, forced-choice format instrument. The BIQ has been reported to have satisfactory internal consistency as well as a factor structure that is theoretically in line with the construct (Apfel & Sifneos, 1979). Other researchers have noted that the BIQ has poor interrater reliability and is highly dependent on the experience, bias, and style of the interviewer (Bagby, Taylor, Atkinson, 1988). Of the seventeen questions, only eight "key" questions are used to obtain the alexithymia score. Although alexithymia is generally thought to present along a continuum, this scale is dichotomous, utilizing a cutoff score of six to diagnose alexithymia.

Gardos, Schniebolk, and Mirin (1984) performed a factor analytic study on the BIQ and found factorial validity of this instrument. However, Taylor and Bagby (1988) severely criticized the methodology employed by Gardos et al. Some of the procedural criticisms of the Gardos study are that the investigators failed to report their extraction criteria and statistical criterion for the factors that were analyzed. There were also criticisms regarding the procedural details of varimax rotation. Perhaps the largest flaw in the BIQ is that it is a dichotomous scale and dichotomous scales are quite unstable when subjected to factor analysis. Thus, there have not been any methodologically sound studies reported to date which establish the validity and reliability of the BIQ. Nevertheless, this instrument has been widely used in alexithymia research for the past fifteen years.

Krystal, Giller, and Chichetti (1986) recognized the flaws in the BIQ and developed the Alexithymia Provoked Response Questionnaire (APRQ). This instrument uses a standardized interview designed to minimize interviewer bias and the problems associated with interrater reliability found in BIQ. The questionnaire is administered as a structured interview. In this

procedure, the interviewer deliberately avoids the introduction of affect laden terms. The questions to be answered by the interviewee closely follow the format of the BIQ. There are seventeen items which are in the form of specific questions designed to assess the patient's capacity for using symbolic and affective language. The patient is asked to imagine her/himself in a variety of potentially stressful situations and to elaborate how they might respond given such a situation. Ambiguous responses are further explored by the interviewer in an attempt to elicit the affective nature of the responses.

Krystal et al. (1986) reports excellent interrater reliability for the total scores (intraclass correlation, $R_1=0.84$). He also reports a high correlation between the BIQ and the APRQ ($r=0.72$, $p=0.0001$) which suggests that this instrument has concurrent validity. However, other types of validity were not assessed in this study and so the overall validity of this instrument cannot be addressed from Krystal's paper.

Psychologists have used projective techniques to assess the imaginal life of patients for over fifty years. These techniques seem particularly well suited

for assessing the fantasy life and emotional status of patients presenting with alexithymic characteristics. Much of the research has centered around the TAT and the Rorschach. In most cases alexithymia was not the sole subject of the studies, rather inferences about alexithymia have been made from Rorschach and Thematic Apperception Test (TAT) (Murray, 1938) data collected on patients identified as having "infantile personalities," (Ruesch cited in Taylor and Bagby, 1988), or psychosomatic patients.

Acklin and Alexander (1988) devised and cross-validated a set of Rorschach response characteristics that they hypothesized to be associated with alexithymia. They used Exner's Comprehensive Scoring System to administer, score, and interpret the Rorschachs of four groups of medical patients and a group of nonpatients. In this study Acklin and Alexander found significantly higher scores for all of the somatically ill patients on all of the Rorschach alexithymia indices (Taylor et al., 1991).

Another projective technique that has demonstrated promise for becoming a valid measure of imagination is the Scored Archetypal Test with 9 elements (SAT9) (Demers-Derosiers, Cohen, & Catchlove, 1983). This test

measures one of the four factors prominent in alexithymia: the absence of symbolic activity demonstrated by impoverished dreams, fantasies, and other imaginative tasks. In this test subjects are asked to draw a picture that will link nine symbols and then to write a short story to explain the drawing. When symbolic function is impaired, the patient produces a drawing that is concrete, without imaginal elaboration or a story theme. The concept is that the symbols produce anxiety but also provide a means of containing that anxiety. Alexithymic patients were noted to produce drawings and stories that were markedly deficient on the anxiety resolution axis. The research presented by Demers-Desrosiers et al. (1983) demonstrated good interrater reliability for the scoring of the SAT9 as well as correlation of the SAT9 with the BIQ. However, the SAT9 did not correlate with the Minnesota Multiphasic Personality Inventory- Alexithymia scale (MMPI-A). The Toronto group reports that they are currently undertaking a study to examine the relationship between the SAT9 and the TAS.

Projective techniques would seem to be the most revealing method of assessing the four factors of the alexithymia construct. The Toronto group, the most

widely published group in the area of alexithymia, is devoted to psychometric methodology which is quantitatively complicated and rigorous. Thus, projective scoring methods will have to be devised to fit into such a mathematical system if this group is to undertake the study of projective techniques seriously.

There are three self-report scales used to assess alexithymia. These are the Schalling-Sifneos Personality Scale (SSPS) (Apfel and Sifneos, 1979) the MMPI-A (Kleiger and Kinsman, 1980), and the Toronto Alexithymia Scale (TAS) (Taylor et al., 1985).

The SSPS was developed in response to criticisms of the interview method of assessing alexithymia. This is a self-report measure which obviates the difficulty of interrater reliability. The SSPS is a 20-item questionnaire with each item rated on a 4-point Likert scale. Scores range from 20 to 80 with the lower scores indicating increased levels of alexithymia. Although a cut-off score was never empirically derived, Sifneos suggested that a score of 50 or below indicates alexithymia (Taylor & Bagby, 1988).

While the SSPS appeared to have good face validity, once again sound psychometric methodology was not employed. The researchers failed to complete an item

analysis on the scale during its construction. Apfel and Sifneos (1979) recognized this and recommended that the scale be treated as a draft in need of psychometric revision. However, the scale was used in its draft form for several research studies on alexithymia.

As more researchers began to use this scale a more rigorous evaluation procedure of the SSPS took place. The findings were disappointing. The SSPS does not correlate with the BIQ. Parker et al. (1991) report the numerous flaws of the SSPS. These serious shortcomings include: poor item-total correlations, poor internal consistency, and an unstable factor structure. The conclusion is that there were many items which were not contributing mathematically to the factor structure of the questionnaire. A revised scale was developed by Martin (1984), and again by Sifneos (1986).

In the Schalling and Sifneos revised version, seven of the original items were rewritten slightly; nine items were replaced by new items; and four items were left unchanged. Also of note is that the 4-point Likert Scale was replaced by a dichotomous scoring system. Parker et al. (1991) studied the adequacy of the SSPS-R utilizing sophisticated psychometric methods of factor analysis, varimax rotation, examination of internal

reliability, and homogeneity. They concluded the the SSPS-R is not a psychometrically sound measure of the alexithymia construct. The conclusion is that the SSPS-R offers no substantial improvement over the SSPS, and in some instances is an even poorer instrument.

The MMPI alexithymia scale (MMPI-A) was developed by Kleiger and Kinsman (1980). This scale selects 22 items from the MMPI which are stable over time and are accurate 82 percent of the time when predicting alexithymia from the BIQ (Kleiger & Kinsman, 1980). Bagby, Parker, and Taylor (1991a) studied the psychometric properties of this scale, also utilizing a factor analytic technique. They concluded that, while the MMPI-A may be empirically valid in discriminating the alexithymics from the non-alexithymics, the items may not represent adequately the full range of the disorder. What is absent from this scale are items that evaluate the capacity to "identify and communicate feelings and to distinguish between feelings and the bodily sensations of emotional arousal--central components of the alexithymia construct" (Bagby, Parker, and Taylor, 1991b, p. 224). These researchers feel that the MMPI is designed to assess neurotic and psychotic

functioning and that alexithymia is different from either of these two constructs.

The Toronto Alexithymia Scale was developed in response to concerns about the psychometric principles of construction of the previous instruments. The TAS has since become the most widely used instrument in assessing alexithymia in the past nine years. Although problems exist with the factor structure of the TAS, this instrument best meets the standards of reliability and validity.

Secondary and Primary Alexithymia

Early theorists examining the alexithymia construct contended that alexithymia is a trait (Marty & de M'Uzan, 1963/1987, Nemiah & Sifneos, 1970). Recently, theorists have examined the possibility that there may be a type of alexithymia which is more state related than trait-like (Freyberger, 1977; Krystal, 1978, 1991a, 1991b, Zeitlin, McNally, & Cassiday, 1993). This recent research, though limited, will be reviewed. Finally, the contribution to the secondary alexithymia literature that this project addresses will be discussed.

In further questioning the construct of alexithymia, Warnes (1986) suggests:

It is quite possible that alexithymia is one of several mediating processes between stress and disease along with genetic susceptibility, developmental variables, context and reaction to untoward life events, coping dispositions, psychosocial support and sociocultural factors.....A differential diagnosis is essential since self-numbing following psychic trauma or pathological grief, masked and atypical depression are treatable (p. 96).

Warnes asserts that differential diagnosis is essential so that clinicians will know if they are dealing with a "primary affectless" condition or a secondary one. In this vein, Warnes suggests that alexithymic traits ought to be distinguished via empirical research from the hysterical 'belle indifference', from schizoid, depressive, and obsessional character styles. This diagnostic dilemma points to the necessity for further research elucidating the alexithymia construct, and differentiating characterological alexithymia from state alexithymia.

Some researchers have suggested that a process of secondary alexithymia may be present in some patients as a response to state changes, particularly those

involving the after effects of traumatic incidents (Freyberger, 1977; Krystal, 1978, 1991a, 1991b; Zeitlin, McNally, & Cassiday, 1993). These investigators posit that secondary alexithymia may be a defensive maneuver which protects individuals against depression or other painful affect. However, empirical research into this phenomenon has produced conflicting results. Taylor et al. (1991) briefly examined the research on secondary alexithymia and concluded that the distinction between the alexithymic reactions to traumatic events needs to be further studied and refined in an effort to make state versus trait distinctions.

Alexithymia has been studied in several medically ill populations (Todarello, La Pesa, Zaka, Martino, & Lattanzio, 1989; Wise, Jani, Kass, Sonnenschein, & Mann, 1988; Wise, Mann, Mitchell, Hryvniak, & Hill, 1990). In several studies a positive relationship between alexithymia and self-reports of anxiety and depression have been observed (Hendryx et al., 1991). In a sample of medical students given the Toronto Alexithymia Scale (TAS), scores on the dimensions pertaining to difficulties identifying and communicating feelings were positively correlated with state anxiety and depression. These authors concluded that based on this correlation,

certain dimensions of the alexithymia construct are indeed state dependent.

The relationship between stress and alexithymia has been tentatively addressed in theory, and recently in preliminary empirical research. Hendryx, et al. (1991) examined the relationship between anxiety, depression, and alexithymia in first year medical students, just prior to end-of-the-year examinations. The justification for selecting this population is that this is a non-clinical sample in which a substantial percentage are expected to be experiencing stress because of end-of-the-year examinations. This implies that stress may be a contributing factor to the development of secondary alexithymia, but no measure of stress was used to confirm this hypothesis.

Alexithymia has been positively related to depression in newly abstinent alcoholics (Haviland, MacMurray, & Cummings, 1988; Haviland, Shaw, MacMurray, & Cummings, 1988). Wise et al. (1988) and Keltikangas-Jarvinen (1987) also concluded that at times alexithymia is a state reaction to adverse events in the environment which also contribute to the development of anxiety and depression.

In a study of medically ill patients, depression and living alone both predicted alexithymia, but alexithymia was unrelated to the severity of the disease (Wise et al., 1988). A weakness of this study is that the Schalling-Sifneos Personality Scale (SSPS) was used as a measure of alexithymia. The current consensus is that the SSPS has serious problems with reliability and validity, and does not yield a four factor solution for the different dimensions of alexithymia (Parker et al., 1991). Also, the subjects in the study were drawn from a sample of medical patients referred for a psychiatric evaluation, suggesting the presence of a pre-existing psychiatric disorder with an affective component.

In a follow-up study (Wise et al., 1990) the TAS was used and essentially the same results obtained. Alexithymia was not significantly related to the severity of illness but was related to quality of life variables and positively to depression. In this later study the authors concluded:

...the nature of alexithymia as an enduring personality trait versus a state reaction in a setting of physical illness, depression, or other psychopathologic conditions (e.g.

alcoholism) remains to be fully elucidated (p. 286).

Other researchers have found that alexithymia is related to the severity of the illness. Keltikangas-Jarvinen (1987) studied a series of patients with gastroenterological disorders and found that as the medical condition of the subjects improved, alexithymic characteristics declined. He hypothesized from this finding that individuals use alexithymic defenses to ward off painful affect. This theory is in line with Krystal's (1978) theory of affective constriction and numbing in the face of traumatic experiences.

Stress and Coping

The way in which stress is conceptualized has a great impact on the way coping is understood and investigated (Singer, 1984). Currently, two major lines of thinking about stress have emerged. One line, proposed by Hans Selye (1976) is regarded as the classic formulation of stress as a physiologic and endocrinological process. Selye and his followers suggest that a stressor is akin to a pathogen, or harmful external agent that stimulates a series of reactions in the brain and endocrine system. In this

view, coping is thought to be a moderator of the neuro/endocrinologic changes associated with stress.

A second line of thought comes from Lazarus and Folkman (1984), who do not focus so much on physiological processes in stress as on the psychological mechanisms of perceiving, appraising, and dealing with threats. Research in this vein may include physiologic or physical threats, but the process studied is psychological and focuses on the individual's management of the threat and the appraisals made about the situation. In Cohen and Lazarus's (1979) thinking, the internal appraisals of stressful events determine the coping mechanisms mobilized. In other words: stress is in the eye of the beholder.

These two lines of research have produced different methodologies, each having different strengths and weaknesses. In examining the mind/body connection, researchers such as Selye use physiological measures to determine the amount of stress experienced. Researchers in the Lazarus camp use cognitive appraisals to determine the amount of stress attributed to situations.

Shelley Taylor (1984) notes that each position has its inherent methodological strengths and weaknesses. She notes that the research in the area of coping is in

desperate need of methodological sophistication. In defining a stressed population, such as one with cancer, researchers have been able to provide insightful information from small samples. For Taylor (1984), the weakness here is that detailed statistical analysis is limited which inhibits accurate interpretations of research findings. Taylor (1984) laments the failure of investigators of coping to control statistically for demographic characteristics of subjects such as financial situation, education, social support, and disease variables, all of which may have a confounding effect on the findings. The present study seeks to capitalize on that advice by gathering extensive demographic and medical information.

In the present study the instrument used to measure coping is the 'fighting spirit' subscale of the Mental Adjustment to Cancer scale. Fighting spirit is thought to combine hope, assertiveness, emotional expression, and a strong sense of purpose (Temoshok, 1992). Since emotional expressiveness is a component of a fighting spirit, it stands to reason that alexithymia as an affective impairment will be associated with a decrease in fighting spirit. Temoshok (1992) believes that fighting spirit is not synonymous with the expression of

anger. She emphasizes that persons with a fighting spirit may express anger or may suppress anger. However, those with a fighting spirit tend to be able to acknowledge their anger and to be assertive. Greer, Pettingale, Morris, and Haybittle, (1985) found that patients whose response to cancer was one of either denial or fighting spirit were significantly more likely to be alive and without a recurrence at a ten year follow up than were patients who responded with what was termed helplessness/hopelessness and passive acceptance.

Objectives of the Present Study

One objective of the study is to examine changes in alexithymia, stress, and coping over time in cancer patients. The current research utilizes a within-subjects design with repeated measures of alexithymia, experienced stress, and coping as related to the experience of cancer, mood, and demographic information. The intervening time period between measurements is approximately three months, which is presumed in most cases to allow for changes in level of stress, disease progression, coping skills, and mood states. A second objective of the study is to determine test-retest reliability. Additionally, the stability of alexithymia

across time will be examined. The measurement of alexithymia and stress and coping at two points in time will allow for a cross-lag analysis (Campbell, 1970; Rozelle and Campbell, 1969).

The present study will attempt to follow up on some hypotheses generated from the very few prior studies on secondary alexithymia, disease, and stress. Hypotheses to be tested include:

1. Subjects reporting a higher total score on the Impact of Events Scale (IES) will also demonstrate a higher score on the Toronto Alexithymia Scale (TAS). The theoretical assumption underlying this hypothesis is that extremely high levels of stress which exceed coping mechanisms will result in a defensive strategy which includes alexithymia.
2. Secondary alexithymia as a reaction to a state change will not be stable over time but will fluctuate with the amount of experienced stress. Whereas primary alexithymia has been assumed to be a trait and supposedly stable over time, the current research will attempt to demonstrate the presence of alexithymia as a defensive state reaction related to the impact of the event of having cancer. A cross-lag analysis (Rozelle &

Campbell, 1969; Campbell, 1970) will be used to test this hypothesis.

3. As alexithymia increases, higher level coping responses as measured by the Mental Adjustment to Cancer (MAC) 'fighting spirit' subscale scale will decrease. In accordance with the first hypothesis, as coping resources are exceeded, reactive defensive measures which seek to limit the emotional response will take the form of alexithymia.

4. Subjects in the higher range of alexithymia will report decreased vigor and increased fatigue (psychosomatic symptoms) as measured by the Profile of Mood States (POMS). This hypothesis is in line with the traditional primary alexithymia research which associates constricted emotional experience as being displaced in the somatic realm of psychosomatic symptomatology.

5. In line with previous research, an increase in depression and anxiety as measured by the Hospital Anxiety and Depression Scale (HADS) will correlate with an increase in alexithymia as measured by the TAS, and stress as measured by the IES.

CHAPTER II

METHOD

Subjects

Forty-eight patients were recruited through referral of oncologists in the Knoxville area to participate in the current study. Approximately 21 patients were recruited as a part of a study to examine the effects of supportive-expressive group psychotherapy in women with cancer. The other patients were recruited from an outpatient oncology center. Oncologists were asked to select patients with advanced cancer and/or with a predicted five year survival rate of less than 40%. Subjects did not receive any compensation for their participation. Of the 48 patients completing the first set of questionnaires, 40 also completed the second questionnaire. Although referring oncologists were asked to refer only patients with advanced cancer, some women with Stage II breast cancer were included in the sample.

In a within-subjects design, patients were asked to fill out a battery of psychological instruments on two separate occasions. The mean length of time between

baseline and follow-up assessment was 98 days ($sd=48.8$). Each subject completed the Impact of Events Scale (IES), the Mental Adjustment to Cancer (MAC) scale, the Toronto Alexithymia Scale (TAS), and the Stanford Oncology Psychosocial Scale. Four patients were severely ill at the time of the second measure and required the assistance of a researcher to complete the questionnaires. In these cases, the questionnaires were read to the subject and the subject's responses were recorded by the investigator. Abbreviated demographic information was collected in these cases.

Cancer is staged according to the National Cancer Institute standards on a scale of I to IV with I being localized cancers and IV being widely disseminated cancers. A general rule of thumb is the higher the stage, the poorer the prognosis for the subject. However, the prognosis of the patient is also largely dependent on the type of tumor. An example of this is that Stage II melanoma has a much worse prognosis than Stage II breast cancer. Despite these differences in morbidity and mortality, an effort was made to recruit patients who were in a high risk category for five-year mortality. In the current study, oncologists and nurses were requested to refer patients with Stage III or Stage

IV cancer. Actually, subjects referred spanned Stage I through Stage IV with the overwhelming majority having Stage IV cancer.

Materials

The following measures were obtained for each subject:

1. Stanford Oncology Psychosocial Questionnaire. The Stanford Oncology Psychosocial Questionnaire is a new instrument developed by Spiegel and Spira (1991). The questionnaire measures socio-demographic variables, as well as social support, health status, sleep, adjustment to cancer, life events, and health problems. This questionnaire includes items known to be useful in predicting both psychosocial and health outcomes. The questions allow researchers to compare the extent to which socio-demographic factors account for disease progression in relation to other psychosocial and medical factors. Psychometric data for this particular questionnaire is not available at the present time.
2. Profile of Mood States. (POMS) (McNair, Lorr & Droppleman, 1971) is specifically designed to assess changes in mood, and has been used extensively. It is a validated screening instrument which has been used in assessing the efficacy of a variety of interventions

(Bloom, 1982; Fawzy, Cousins, Fawzy, Kemeny, Elashoff & Morton, 1990; Spiegel, Bloom, & Yalom 1981; Weismann & Worden, 1975). The POMS yields a score for total mood disturbance as well as anxiety, depression, hostility, confusion, vigor, and fatigue. It contains 65 Likert-type items. Internal consistency and reliability scores are .90 or better. Test-retest reliabilities for the six factors range from .61-.69 (McNair et al., 1971). Validity studies of short-term psychotherapy and controlled outpatient drug trials indicate that the POMS is sensitive to change associated with treatment. It takes 5 minutes to complete. Hand scoring templates are provided with the instrument package.

3. Toronto Alexithymia Scale. (TAS) (Taylor, Ryan, & Bagby, 1985): The TAS is a 26-item instrument with a 5-point Likert scale which was normed on samples of college students and normal adults. The TAS has demonstrated internal consistency (Cronbach's $\alpha = .82$, $p < 0.0001$), good test-retest reliability ($r=0.77$, $p < 0.0001$), and convergent and divergent validity (Bagby, Taylor, Parker, Loiselles, 1990). The TAS has been subjected to factor analysis which has yielded a four-factor solution that matches the four identifying characteristics of alexithymia: 1) difficulty

identifying and describing feelings; 2) difficulty distinguishing feelings from bodily sensations; 3) reduction or absence of symbolic thinking (or a lack of imaginative ability); and 4) an external, operative cognitive style. The scale is continuous where alexithymia varies in degree. However, researchers suggest that a score of 74 or above indicates the presence of alexithymia and a score of 54 and below indicates no alexithymia. The twenty points in between represent an ambiguous area.

4. Mental Adjustment to Cancer (MAC) (Watson, Greer & Bliss, 1989) was designed in order to provide a method of assessing specific responses to having cancer. The coping dimensions measured by the scale are: 'fighting spirit,' 'helpless/hopeless,' 'anxious preoccupation,' 'fatalism' and 'avoidance'. The MAC scale assesses the extent to which patients utilize these responses in their adjustment to the diagnosis and treatment of cancer. The validity of the MAC scale was established by comparing patients' to spouses' ratings of adjustment. In a separate study (Greer, Moorey, & Watson, 1989) clinical ratings were compared with MAC scale scores. This comparison yielded high agreement ($Kappa = .72$). The internal consistency of the subscales

was measured by examining item-total correlations. The results indicated that each subscale was clearly homogeneous with significant correlations between items. Alpha coefficients ranged from 0.65 to 0.84 (Watson, Greer, Young, Inayat, Burges, & Robertson, 1988). Scoring of the scale is detailed in the manual provided by Watson et al., (1989).

5. Impact of Events Scale (IES) (Horowitz, Wilner, & Alvarez, 1979) measures current subjective distress, related to a specific event. The IES is a 15 item scale which measures intrusion, avoidance, and mean total stress score. Intrusion is defined as the experience of unwanted thoughts and images, traumatic dreams, strong feelings, or repetitive behaviors. The authors define avoidance as ideational constriction, denial of the meanings and consequences of the traumatic event, and psychic numbing. The split-half reliability of the total scale ($r = 0.86$) is quite high. Internal consistency of the subscales was also high as measured by Cronbach's α (intrusion = 0.78, avoidance = 0.82). The test-retest reliability for the total stress scores was reported as 0.87. These investigators reported that the clustering of items in a coherent fashion around the subscales indicates that the scale is empirically valid.

They also report that clinicians have found the IES to be useful in following persons suffering from stress related to a specific event over time. In a clinical sample of patients undergoing psychiatric treatment for stress related difficulties, the mean IES score was 39.5. In a non-clinical sample the mean IES score was noted to be 9.8.

6. Hospital Anxiety and Depression Scale (HADS)
(Zigmond and Snaith, 1983). The HADS has received wide use, especially for the assessment of depression and anxiety in the physically ill (Ahmedzai, 1990; Strain, 1990). The HADS is useful because it both separates depression from the physical symptoms of disease, as well as allowing for a continuum of mood that is positive as well as negative. Potential scores on the HADS range from 0 to 42. The recommended cutoff score for indicating the possibility of pathology is 8 (Zigmond & Snaith, 1983). In a study of 568 cancer patients administered the HADS (Moorey, Greer, Watson, Gorman, Rowden, Tunmore, Robertson, & Bliss, 1991) researchers concluded that the HADS factor structure was stable with internal consistence of the two subscales being quite high (Cronbach's $\alpha = 0.90$ for the depression subscale and 0.93 for the anxiety subscale). These

researchers hypothesized that patients with earlier stage cancer would be more likely to report anxiety, while those with more advanced disease would be expected to report more depression, however no studies using the HADS in patients with advanced cancer have been reported yet.

7. Medical Information Questionnaire. This questionnaire is designed to gain basic medical information including: the primary site of cancer, the initial state of disease and the current stage of disease, date of initial diagnosis as well as date of any recurrence, and types of treatment received so far.

Several other measures were included as a part of a larger study of the psychological effects of having cancer. Scores from these measures were not used in the present investigation.

Procedure

Patients were recruited for the study by advertisements in the newspaper, local oncologists and nurses, and by staff members of several local oncology centers. Patients indicating their interest in participating in the study were contacted by a researcher by telephone and the study was explained to

them. If they were still interested they were mailed a consent form and a set of questionnaires. Each patient was identified by an assigned subject code appearing on all sets of questionnaires. Patients were told that they were free to withdraw from the study at any time and were encouraged to contact the investigator with any questions or concerns. Patients were instructed to return their completed questionnaires to their local oncology office, or to the researcher via a pre-addressed stamped envelope provided by the investigator.

Following a minimum of four weeks, the patients were re-contacted and were mailed the second set of questionnaires. If patients were too sick to fill out the questionnaires the investigator went to the hospital or to their homes to collect data. Forty patients were able to complete measures at both times. Again, patients were contacted by phone to inquire about any questions or difficulties and to encourage the return of the questionnaires in the stamped envelope provided for this purpose.

In summary, each patient was contacted by a researcher on the telephone or in person to have the study explained to them. After expressing continued interest in participating, informed consent was

obtained. Questionnaires were then administered to the patients. The target window for follow up was between two and four months following the initial assessment.

Data Analysis

Data were analyzed using Pearson product moment correlations where appropriate and standard multiple regression. In building a post-hoc model of the relationship between alexithymia and stress, the TAS was treated as the dependent variable. The predictor, or independent variables were the 'fighting spirit' subscale of the MAC, the fatigue and vigor subscales of the POMS, and the anxiety and depression subscales of the HADS, and the intrusion and avoidance subscales of the IES. The purpose of using subscale scores was to further delineate the specific contributions of the components of each variable.

In the present study, data were also analyzed using a cross-lagged panel correlation technique as described by Rozelle and Campbell (1969). This technique allows the investigator to choose among probable causal hypotheses. In this technique the IES and the TAS scores were correlated at each time interval. A cross-correlation was obtained for the IES at baseline and the

TAS at follow-up and for the TAS at baseline and the IES at follow-up. There are four rival hypotheses to be tested with this model. The four rival hypotheses are:

- 1) Stress "promotes" alexithymia
- 2) Alexithymia "promotes" stress
- 3) Stress "suppresses" alexithymia
- 4) Alexithymia "suppresses" stress

The present research postulates that hypotheses one and four are most consistent with the theoretical assumptions of secondary alexithymia as a defensive response to overwhelming stress.

CHAPTER III

RESULTS

Patient Demographics

Detailed demographics of the sample are presented in Table 1. A general demographic profile of the sample shows that the sample was predominantly female and Caucasian. The mean age of the patients was 52.9 years ($sd=10.5$). Demographics related to the stage of disease are summarized in Table 2. A breakdown by primary site of tumor is given in Table 3. As previously noted, a large portion of the sample ($n=30$) had Stage IV cancer at the time of the initial assessment.

Other demographic information collected includes the length of time from baseline to repeat measure. The mean for this interval was 98 days ($sd=48.8$). At the time of the baseline measure 37.5% ($n=18$) had already experienced a recurrence of their cancer, while 60.4% ($n=29$) were being treated following an initial diagnosis.

Table 1

Characteristics of Study Sample

Characteristic	Number	Percentage
<u>Age (Years)</u>		
30-39	3	6.2
40-49	17	35.4
50-59	15	31.3
60-69	11	22.9
70-79	2	4.2
<u>Education (Years)</u>		
1-8	5	10.4
9-12	23	47.9
13-16	12	25.0
17-20	6	12.5
Unknown	2	4.2
<u>Family Income (Thousands)</u>		
< \$ 20	13	27.1
\$21-39	12	25.0
\$40-59	4	8.3
\$60-79	3	6.3
\$80-99	1	2.1
Unknown/Refuse to Answer	15	31.2
<u>Race</u>		
White	42	87.5
African American	3	6.2
Native American	1	2.1
Hispanic	1	2.1
Other	1	2.1

Table 2

Current Stage of Disease at Baseline Entry Into Study

Stage of Disease	Number of Patients	Percentage
Stage I	2	4.2
Stage II	5	10.4
Stage III	7	14.6
Stage IV	30	62.5
Unknown	4	8.4

Table 3

Distribution and Frequency of Type of Cancer by Patient
For the Entire Sample of 48 Subjects

Primary Location	Number of Patients	Percentage
Breast	23	47.9
Colon	9	18.8
Lung	6	12.5
Melanoma	1	2.1
Other ¹	7	14.6
Unknown	2	4.2

¹ Other types of primary tumors include: gastric carcinoma, lymphoma, renal carcinoma, multiple myeloma, primary brain tumors, and Kaposi's sarcoma.

Patients were surveyed about their religious affiliation and attendance. The sample was overwhelmingly Protestant (n=41). Also of note was that 43.8% (n=21) indicated that they attended religious services one or more times a week. Another 20.8% (n=10) indicated that they attended religious services one or more times a month. Only 6.3% (n=3) stated that they never attended religious services.

Social support variables were also extensively surveyed. A brief summary of social demographics indicates that 58.3% (n=28) of the patients were currently married. Another 23.0% (n=11) were separated or divorced. Widowed patients accounted for 12.5% (n=6) of the sample. One question on the social support questionnaire asked patients "Is there one special person you are close to?" The patients overwhelmingly reported affirmatively to this question with 91.7% (n=44) endorsing this item positively. The quality of social relationships was assessed by asking patients "How satisfied are you with your relationships?" More variability was demonstrated in responses to this question with 25% (n=12) responding that they were completely satisfied, while 50% (n=24) indicated that they were very satisfied, 14.6% (n=7) indicated they

were somewhat satisfied, and 4.2% (n=2) indicated that they were not very satisfied. No subject indicated that they were not at all satisfied with their social relationships.

Characteristics of Measures

The means and standard deviations of the scales used are found in Table 4. Of note is that the mean TAS score was 63.1 (sd= 12.2) and 65.0 (sd=11.8) for baseline and repeat measures respectively. These values fall within the ambiguous area of alexithymia as measured by the TAS. The standard cutoff score for definitive alexithymia is 74. To rule out alexithymia, researchers use a score of 54. Thus, in the current sample, the patients appear to fall within a range of probable alexithymia.

On the HADS the mean total score at baseline and follow-up was 10.1 (sd= 7.4) and 9.4 (sd=6.8) respectively. The mean scores for the HADS anxiety subscale were 6.4 (sd= 4.2) and 5.9 (sd= 4.3) at baseline and follow-up. For the depression subscale the means were 3.6 (sd=3.7) and 3.4 (2.9) for baseline and follow-up measures. Zigmond and Snaith (1983) recommend that a score of 8 or higher on either the anxiety or

Table 4

Descriptive Statistics for the TAS, IES, MAC-FS, HADS, BPOMFAT, and POMVIG at Baseline and Follow-Up

Measure	N	Mean	SD	Range
TAS (baseline)	48	63.1	12.3	32-86
TAS (follow-up)	40	65.0	11.8	42-84
IES (baseline)	46	34.5	10.1	17-57
IES (follow-up)	38	33.6	9.3	18-49
MAC-FS (baseline)	43	53.1	6.3	40-64
MAC-FS (follow-up)	37	52.1	6.0	41-64
HADS (baseline)	43	10.1	7.4	1-34
HADS (follow-up)	35	9.4	6.8	1-29
POMSFAT (baseline)	45	9.6	7.0	0-28
POMSFAT (follow-up)	36	9.0	6.7	0-26
POMSVIG (baseline)	44	16.3	7.3	3-31
POMSVIG (follow-up)	35	16.3	6.5	3-28

TAS= Toronto Alexithymia Scale; IES= Impact of Events Scale; MAC-FS= Mental Adjustment to Cancer- Fighting Spirit subscale; HADS= Hospital Anxiety and Depression Scale; POMSFAT= Profile of Mood States Fatigue subscale; POMSVIG= Profile of Mood States Vigor subscale

depression subscales be taken as indicators of possible pathology.

The 'fighting spirit' subscale of the MAC was used as a variable to measure an effective coping response to the event of having cancer. Values for this subscale were 53.1 (sd=6.3) and 52.1 (sd=6.0) at baseline and follow-up. These scores are comparable to the scores of the sample of cancer patients on which the MAC was normed (Watson et al., 1989).

For the IES the mean scores on the total scale were 34.5 (sd=10.1) and 33.6 (sd=9.3) for baseline and follow-up measures respectively. For the subscales the mean intrusion subscale scores were 16.49 (sd=5.22) and 15.88 (sd=5.36). The subscale scores for avoidance were 18.33 (sd=5.79) and 17.82 (sd=5.32). The total score is consistent with a population experiencing a good deal of stress and is comparable to Horowitz et al.'s (1979) clinical sample of patients undergoing psychiatric treatment for stress related syndromes.

Finally, the POMS was scored according to the scoring manual. On the fatigue subscale the baseline mean was 9.6 (sd=7.0) and the follow-up mean fatigue score was 9.0 (sd=6.7). In the normative sample of patients with no reported disorder the mean fatigue

subscale score was 8.4 (McNair et al., 1971). For the subscale measuring vigor, the baseline score was 16.3 (sd=7.3) and the follow-up score was 16.3 (sd=6.5). In the McNair et al. (1971) normative sample the mean score for vigor was 9.8. Of note, from the normative sample is that patients with somatic disorders reported a higher vigor score than patients with psychoneurosis, personality disorder, psychosis, and no disorder. The somatic patients had a mean vigor score of 12.3.

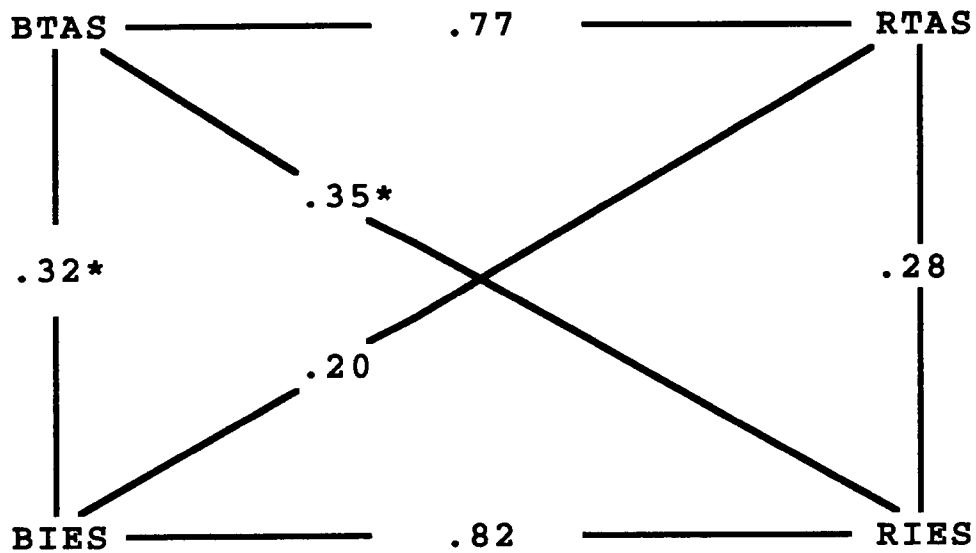
Test-retest reliability was calculated using Pearson Product Moment correlations between baseline and repeat measures (Kachigan, 1982). For the TAS, test-retest reliability was .77 ($p \leq .01$); for the POMS Vigor subscale the reliability was .76 ($p \leq .01$); for the IES, .82 ($p \leq .01$); for the HADS, .86 ($p \leq .01$); for the MAC 'fighting spirit' subscale, .74 ($p \leq .01$); and for the POMS fatigue subscale, .38 ($p \leq .05$). Thus, all measures demonstrated significant reliability across the interval, indicating the stability of the measure as well as stability of the construct being measured. This finding will be further addressed in the discussion section.

Tests of Hypotheses

Prior to statistical analysis, data were examined for extreme values, multicollinearity, singularity, normality, and linearity (Tabachnick and Fidell, 1989). The data were acceptable and no transformations were required.

The first hypothesis tested was that patients reporting a higher total score on the IES would also demonstrate a higher score on the TAS. Evidence for this relationship obtained in the baseline measure with a Pearson correlation of .32 ($p \leq .05$, two-tailed) ($n=45$). However, for the repeat measure, significance was not reached in the correlation between the TAS and the IES. ($n=37$, $r=.28$, n.s.).

The next hypothesis tested was that secondary alexithymia is a reaction to a state change and will not be stable over time, fluctuating with the amount of experienced stress. A cross-lag analysis (Campbell, 1970; Rozelle and Campbell, 1969) was employed to test this hypothesis. The results of this analysis are detailed in Figure 1. Contrary to the hypothesis, stress at baseline did not predict alexithymia at follow-up. However, modest significance for alexithymia at baseline predicting stress at follow-up was obtained



* $p \leq .05$ (two-tailed)

BTAS= Baseline Toronto Alexithymia; RTAS= Repeat Toronto Alexithymia Scale; BIES= Baseline Impact of Events Scale; RIES= Repeat Impact of Events Scale

Figure 1

Cross-Lagged Panel Correlation Technique Examining the Correlations Between the Toronto Alexithymia Scale (TAS) and the Impact of Events Scale (IES) at Baseline and Repeat Assessments

($r=.35$, $p \leq .05$, two-tailed). This analysis also demonstrated the high correlation between baseline and repeat measures of the TAS and the IES. The stability of the perceived stress related to cancer was somewhat of a surprise and will be addressed in the discussion section.

The third hypothesis to be examined was that as alexithymia increases, higher level coping responses as measured by the MAC 'fighting spirit' subscale will decrease. For the entire sample at baseline ($n=42$) significance was not obtained for an inverse relationship between fighting spirit and alexithymia ($r=-.28$). Accordingly, the sample was split at the TAS mean and a correlation analysis of the split sample was obtained. This correlation proved to be non-significant for the relationship of the 'fighting spirit' subscale and the IES to the TAS group either above or below the TAS mean. There was not a sufficient number of patients to examine the relationship of the FS subscale and the IES to the TAS at the cutoff score above 74 for definitive alexithymia.

The fourth hypothesis tested is that the TAS will correlate negatively with vigor and positively with fatigue as measured by the POMS. A correlation matrix

for the sample is shown in Table 5. A scattergram of the correlations is shown in Figure 2. For the total baseline sample (n=48) significance was obtained for an inverse relationship between vigor and alexithymia ($r = -.44$, $p \leq .01$). Significance was not obtained for a positive relationship between fatigue and alexithymia nor for the interaction variable created between fatigue and vigor. Again the sample was split at the TAS mean and patients in the upper and lower range of alexithymia were examined for relative differences in energy level. Significance was not obtained for any variables.

The fifth hypothesis tested in the planned comparison stage of data analysis is that an increase in depression and anxiety as measured by the HADS will correlate with an increase in alexithymia as well as with an increase in reported levels of stress. A correlation matrix for this hypothesis is found in Table 6. A scattergram of the correlations is shown in Figure 3. In this analysis the BTAS correlated significantly with the BHADST score ($r = .32$, $p \leq .05$). A closer examination of this hypothesis shows that the anxiety subscale of the HADS carries the significant weight of the total correlation. The anxiety subscale

Table 5

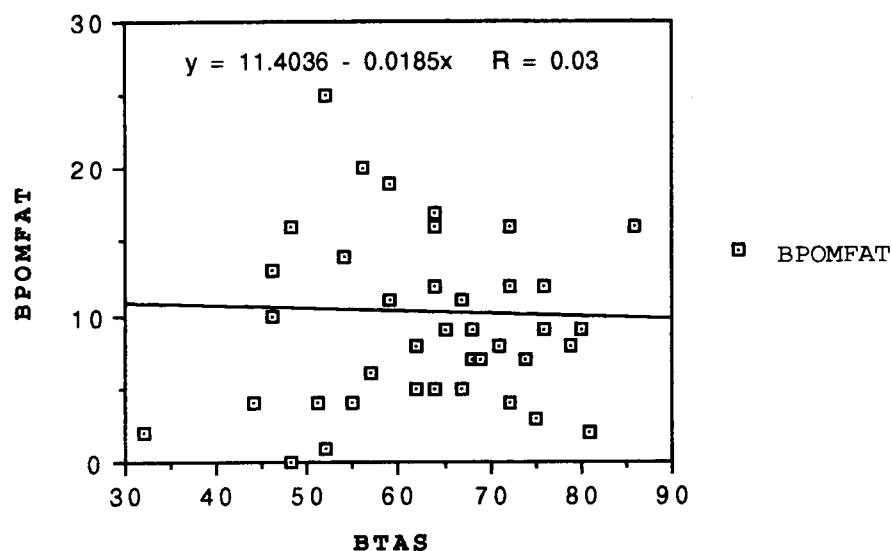
Correlation Matrix for Alexithymia, Fatigue, Vigor, and
the Interaction Variable of Fatigue x Vigor

	BTAS	BPOMFAT	BPOMVIG	BPOMFAVI
BTAS	1.00	.05	-.44**	-.12
BPOMFAT		1.00	-.49**	.71**
BPOMVIG			1.00	.12
BPOMFAVI				1.00

** $p \leq .01$

BTAS= Baseline Impact of Events Scale; BPOMFAT= Baseline Profile of Mood States Fatigue subscale; BPOMVIG= Baseline Profile of Mood States Vigor subscale; BPOMFAVI= Baseline Profile of Mood States Fatigue X Vigor interaction variable

SCATTERGRAM OF BTAS VS. BPOMFAT



SCATTERGRAM OF BTAS VS. BPOMVIG

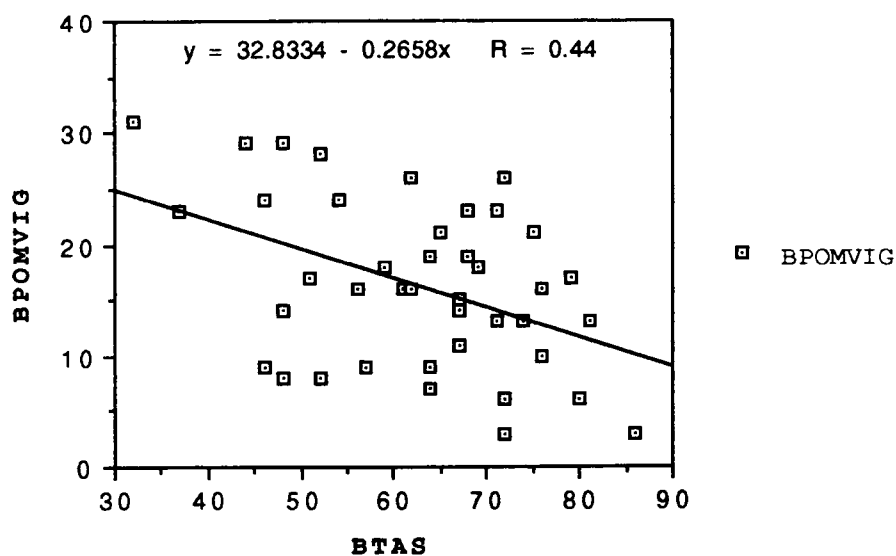


Figure 2

Scattergrams of Correlations Between the BTAS vs. BPOMSFAT and BTAS vs. BPOMVIG

Table 6

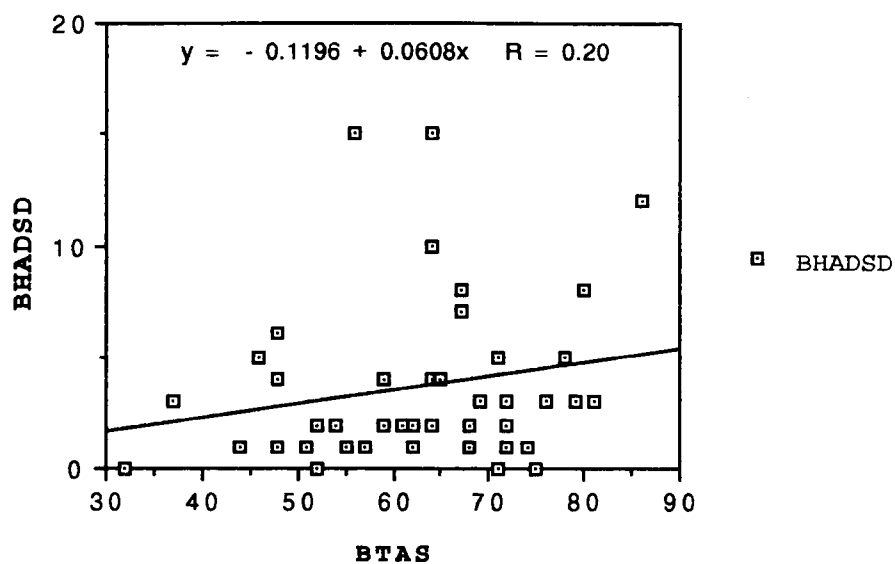
Correlation Matrix for Alexithymia, Anxiety, Depression,
and Stress

	BTAS	BHADST	BHADSA	BHADSD	BIESTOT
BTAS	1.00	.32*	.39**	.20	.32*
BHADST		1.00	.95**	.93**	.67**
BHADSA			1.00	.76**	.68**
BHADSD				1.00	.57**
BIESTOT					1.00

* $p \leq .05$ ** $p \leq .01$

BTAS= Baseline Toronto Alexithymia Scale; BHADST= Baseline
Hospital Anxiety and Depression Total score; BHADSA= Baseline
Hospital Anxiety and Depression- Anxiety subscale; BHADSD=
Baseline Hospital Anxiety and Depression- Depression subscale;
BIESTOT= Baseline Impact of Events Scale Total score

Scattergram of BTAS vs. BHADSD



Scattergram of BTAS vs. BHADSA

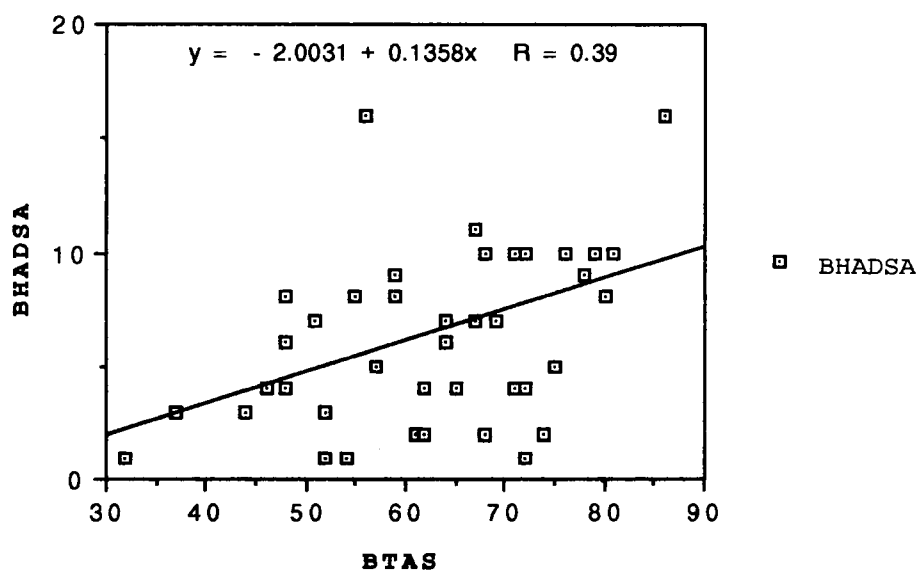


Figure 3

Scattergram of Correlations Between BTAS vs. BHADSD and
BTAS vs. BHADSA

demonstrated an even higher level of association with the TAS when examined without the depression subscale. Thus, alexithymia appears to be more significantly related to anxiety than depression ($r = .39, p \leq .01$).

The second part of this hypothesis, that anxiety and depression will be significantly associated with stress was also demonstrated. While stress is modestly correlated with alexithymia ($r = .32, p \leq .05$), stress as measured by the IES is even more significantly correlated with both depression ($r = .57, p \leq .01$) and anxiety ($r = .68, p \leq .01$).

Post-Hoc Analysis of Data

Following the tests of specific hypotheses an exploratory post-hoc analysis of the data was undertaken. The purpose of this examination was to examine alexithymia and stress as dependent variables and to understand more about the predictive capabilities of a number of independent variables. For this procedure, standard multiple regression analysis was used in order to build a model which estimated the amount of variance contributed by the independent variable subscales. Standard multiple regression was selected for this procedure.

The multiple regression equation used the BTAS as the dependent variable. Independent variables considered were the subscales of the HADS, the IES, the 'fighting spirit' subscale of the MAC, and the fatigue and vigor subscales of the POMS. With the seven subscale scores entered into the equation as independent variables, 43% ($F=.025$) of the variance was predicted. Table 7 summarizes the results of the regression with the significance of all variables entered into the equation.

Table 7

Standardized Multiple Regression Analysis Predicting
Alexithymia From Subscale Scores of the HADS, POMS, MAC,
and IES

Step	MultR	R ²	sigF	Variable	BetaIn
1				in BHADSA	.3212
2				in BMACFS	-.0185
3				in BPOMFAT	-.2317
4				in BPOMVIG	-.6443
5				in BIESAVO	.0170
6				in BIESINT	-.3884
7	.6576	.4325	.025	in BHADSD	-.0974

BHADSA= Baseline Hospital Anxiety and Depression Scale- Anxiety subscale; BMACFS= Baseline Mental Adjustment to Cancer Fighting Spirit subscale; BPOMFAT= Baseline Profile of Mood States Fatigue subscale; BPOMVIG= Baseline Profile of Mood States Vigor subscale; BIESAVO= Baseline Impact of Events Scale- Avoidance subscale; BIESINT= Baseline Impact of Events Scale- Intrusion subscale; BHADSD= Baseline Hospital Anxiety and Depression Scale- Depression subscale

CHAPTER IV

DISCUSSION

Methodological Issues

In this repeated measures design, the assumption made by the investigator was that stress would vary with time, and would tend to increase with the progression of disease. Surprisingly, among measures of stress, alexithymia, fighting spirit, anxiety and depression, and vigor, no significant differences were found between the baseline and repeat measures.

A possible reason for this finding includes insufficient time between measures for disease progression to occur and to produce a measurable psychological effect. During the course of the study, the interval between measures was shortened because of subject attrition, notably due to death. In a seriously ill population, a study with a significant time interval expectably leads to greater subject attrition. One method of overcoming this obstacle would be to enter more patients in the study, lengthen the interval, and allow the extra patients to compensate for the increased rate of attrition related to death.

Yet another methodological consideration relates to the exclusive use of self-report measures. This single method approach limits the investigator in addressing convergent validity. Campbell and Fiske (1959) advocate using the multitrait-multimethod matrix for examining convergent and divergent validity. By using the TAS as the sole measure of affective capacity, the current project does not capitalize on the multitrait-multimethod recommendation. Using the IES as the lone measure of stress also renders the study vulnerable to the criticism of single-method research. The Rorschach as a measure of affective capacity and recognition would provide a diverse methodology for assessing affect, as well as expanding the exploration of affect beyond the limits of alexithymia.

Another possible measure is picture arrangement scores from the Wechsler Adult Intelligence Scale-Revised (WAIS-R). Object relations theorists assert that affective experience is object seeking, and affects are expressed in interpersonal contexts (Modell, 1975; Segal, Westen, Lohr, and Silk, 1993). To further test the affective capacity of patients picture arrangement might be used to test their understanding of the subtleties of interpersonal interaction and affective

expression. This approach to personality assessment to further understand the affective and cognitive components of interpersonal schemata was recently advocated by Segal et al. (1993).

Likewise, using new advanced technology in psychoneuroimmunology to assess the physiological aspects of stress on immune functioning would diversify the methodology and provide a more sophisticated quantitative measure of stress. This would also bridge the stress research gap between Selye's camp and the Lazarus and Folkman group and provide for convergent validity studies.

Lack of Significant Change Scores

As noted above, a general lack of significant change between baseline and follow-up assessments was noted across the board for the measures administered. Lack of a sufficient time interval is one plausible reason for this lack of significant change. Another somewhat more questionable reason for the lack of significant variability between the measures at baseline and follow-up are that all of the instruments are in some way tapping trait as opposed to state characteristics.

This hypothesis is highly unlikely for several reasons. The IES asks respondents to rate stress related to the event of having cancer as experienced during the past week. In past research, the IES has been demonstrated to vary markedly over time in a population with a diagnosed stress response syndrome. In the Horowitz et al. (1979) study, thirty-two patients seeking treatment at a psychiatric clinic for stress response syndromes completed the IES at entry into the study and again following an interval of 11 weeks. The mean IES score at Time 1 was 43.7 while the mean IES score after an average of 11 weeks and brief psychotherapy was 24.3. This variability is clearly not present in the current data set.

Another finding with the IES data from the current study is the restriction of range present. In the current study the minimum score on the IES is 17 and the maximum is 57 ($sd=10.1$). In the Horowitz et al. (1979) study the range was 0-69 with a standard deviation of 17.2. Their patients, with documented stress response syndromes, showed much greater range and variability around the mean than the current study. However, in the current study, the mean IES score at both baseline and follow-up places the patients with cancer in the same

score range of Horowitz's sample of patients with documented stress response syndromes prior to any treatment.

One possible explanation for the lack of variability is in the ongoing nature of the stress patients in the current study experience. In the Horowitz et al. (1979) study, the stressful events included bereavement, or personal injuries resulting from accidents, violence, illness, or surgery. In their sample, patients were attempting to cope with a situation which had significantly altered their lives, but was not currently threatening to end it. In the current sample, patients with advanced and advancing cancer are facing a situation which is generally expected to continue deteriorating as opposed to improving with time.

Finally, the current sample started with a fairly high level of reported stress as measured by the IES. A ceiling effect may have been achieved at the time of measurement, without much room for significantly more stress to be measured. To remedy this, a new measure of stress which accounts for the range of severity of stress that may be present in a progressively ill

population as opposed to Horowitz's progressively recovering population would have to be developed.

Discussion of Hypotheses

The first hypothesis tested was that stress as measured by the IES would be positively related to alexithymia as measured by the TAS. As noted before, this hypothesis was confirmed at the baseline measure (n=48), but significance did not obtain at the repeat measure (n=38). One obvious explanation of this discrepancy is that the attrition of patients between baseline and repeat measures rendered the correlation insignificant. Remedying this would require increasing the number of patients.

A second reason for the lack of a correlation at the follow-up measure is that although levels of stress reported do not seem to decline, and levels of alexithymia do not significantly decrease, their interrelationship may be altered as time passes. How this occurs is not understood but may reflect the patient's attenuation to the stress and a diversification of coping mechanisms which modifies an alexithymic response. However, without addressing the

problem of lack of sufficient numbers of patients, this hypothesis is unverifiable in this particular data set.

The second hypothesis was that secondary alexithymia is a reaction to a state change and will not be stable over time, fluctuating with the amount of experienced stress. This hypothesis was not supported by the findings with several interesting results noted. Most surprising was the stability of reported stress related to the experience of having cancer as measured by the IES. The correlation between the baseline IES measure and the repeat IES measure is .82 ($p \leq .01$). This finding was not at all anticipated and is at odds with the declining stress scores reported by Horowitz et al. (1979) in their samples of recently traumatized patients and first year physical therapy students. This finding suggests that in patients with well advanced cancer, stress does not fluctuate but remains at a rather high level.

Using the Cross-Lagged Panel Correlation Technique (Rozelle & Campbell, 1969) allowed the researcher to examine the hypothesis that stress at baseline would predict alexithymia at follow-up as a way of managing stress or as a reaction to stress. In fact, the opposite was demonstrated with alexithymia at baseline

correlating positively and significantly ($r=.35$, $p \leq .05$) with stress at the repeat measure, while stress at baseline correlated positively but not significantly with alexithymia at the repeat measure.

This finding is in direct contradiction to the basic premise of the study, which was that alexithymia may be a state reaction to the stress of having cancer. In the Cross-Lag analysis the correlations argue for alexithymia preceding or promoting stress at a later time. In theory this suggests that the inability to express affect or make use of fantasy processes to mediate reality based situations leads to the increased experience of stress down the line. Thus, the awareness of affective states and the ability to use fantasy processes seems to modulate stress. An inability to make use of intrapsychic coping mechanisms related to the experience and perhaps discharge of affect may increase the likelihood of the experience of stress.

The third hypothesis proposed that coping as measured by the 'fighting spirit' subscale of the MAC would decrease as alexithymia increased. While this correlation was in the appropriate direction ($-.28$, n.s.) it was not significant. Again, not reaching significance may be a reflection of an insufficient

number of patients. Another probability is that fighting spirit may represent a more cognitively based strategy as opposed to an affective mastery. In this view, fighting spirit represents an attitude which consists of cognitive appraisals combined with affective capacity. In this case, alexithymia may not suppress the cognitive element of fighting spirit, but may indeed suppress an affective component. Again, this draws into question the construct of 'fighting spirit' as well as alexithymia and suggests that each construct requires further delineation.

In the fourth hypothesis, alexithymia was predicted to correlate negatively with vigor and positively with fatigue as measured by the POMS. Vigor was negatively and significantly correlated with alexithymia. The correlation between alexithymia and fatigue was almost zero, without any discernable relationship between the two. Of interest is the high mean vigor score in the current sample as opposed to the normative sample presented by McNair et al. (1971). The mean baseline score of 16.3 on the vigor subscale is higher than any of the normative sample groups of psychotic, neurotic, personality disorder, psychosomatic, or no disorder groups. In the McNair et al. (1971) sample of patients

those with the highest vigor score were the patients with psychophysiological disorders with a mean for this group of 12.3. The patients in the normative sample who were classified as "normal" or having no disorder had a mean vigor score of 9.8, the lowest of all of the normative groups. Explaining the high vigor score for the current sample is somewhat difficult.

On the surface a high vigor score would suggest that the patients in the current sample are most closely related to the patients in the psychophysiological disorder segment of the McNair et al. (1971) sample. These investigators hypothesized "denial of disturbed affect has been frequently reported in patients with psychophysiological symptoms (p. 15)." However, since the construct of alexithymia posits that this disposition includes a denial or unawareness of affective experience, the negative correlation between vigor and alexithymia in this sample is somewhat curious.

The dilemma this finding presents is quite intriguing. The construct of alexithymia has been studied most extensively in psychosomatic patients. Patients with classically psychosomatic diseases have been found to be more alexithymic than controls in

several studies (Todarello et al., 1989; Wise et al., 1988; Wise et al., 1990). In the normative sample for the POMS, patients with psychosomatic diseases were found to have higher vigor subscale scores than other patient and non-patient groups. Making use of the transitive property of mathematics, one would expect that high vigor scores would be positively correlated with higher alexithymia scores. The present study, in fact, demonstrated the opposite with higher alexithymia scores being negatively correlated with high vigor scores. The caveat for this study is that alexithymia was measured in cancer patients, not patients with typical psychosomatic diseases. Therefore, the question of a different relationship between alexithymia and physical disease is posed.

In the present study, alexithymia was hypothesized to be a reaction to a life-threatening physical condition which is presumed not to be psychosomatic in origin. Traditional alexithymia theory posits that psychosomatic diseases are in part a response to displaced affective experience, and that alexithymia is an underlying promoter of psychosomatic conditions. The findings of this study raise the question of a separate

type of alexithymic experience with different concomitant sequelae.

The second part of the fourth hypothesis was that alexithymia would be positively correlated with fatigue as measured by the POMS. Again, this hypothesis was based on previous theoretical assumptions that alexithymic individuals are more likely to report distressing somatic symptoms while denying affective symptoms. The examination between alexithymia and fatigue in the current study yielded a correlation coefficient of $r = .05$ (n.s.). Thus, in the current study, when simple Pearson product-moment correlations were performed there was no appreciable relationship between fatigue and alexithymia. Again, this suggests that alexithymia, at least in cancer patients is not associated with increased somatic complaints in the form of physical fatigue.

Finally, the fifth hypothesis tested was that depression and anxiety as measured by the HADS will be positively associated with alexithymia. This hypothesis was sustained ($r = .32$, $p \leq .05$). A closer examination of the HADS subscale scores demonstrated that the anxiety subscale carries the weight of the correlation, and that depression alone is not significantly related

to alexithymia. Again, this finding contradicts contemporary research in which a positive association between alexithymia and depression has been found (Haviland et al., 1988; Hendryx et al., 1991; Keltikangas-Jarvinen, 1987; Wise et al., 1988). These researchers also found a positive relationship between anxiety and the TAS.

The current research utilized the HADS which was developed for use specifically in a medical population. The HADS depression subscale was constructed so that somatic items commonly associated with physical illness as well as depression were eliminated (Moorey et al., 1991). In this measure, depression as a cognitive and affective experience is measured without an emphasis on somatic symptoms. The lack of correlation between alexithymia and depression as measured by the HADS may reflect the narrowed definition of depression used by this instrument. Second, since alexithymia is reported to be linked to increased somatic complaints, the lack of a somatic axis on this questionnaire may be the element which suppresses a significant correlation.

A post-hoc analysis of the data was done using standardized multiple regression . The TAS was used as the dependent variable with the subscales of the

measures entered as independent variables. The goal was to perform an exploratory analysis of the data to examine how the independent variables as a group predict alexithymia. The results of this analysis supported vigor as the greatest predictor of alexithymia.

In multiple regression the solution is extremely sensitive to the combination of independent variables included in the equation. The importance of an independent variable in predicting the dependent variable is related to and depends on the other independent variables entered into the equation (Tabachnick & Fidell, 1989). In the current solution, variables which seemed related to alexithymia were selected, however in so doing, several of the independent variables selected were found to be significantly correlated with one another, a fact which exploits the sensitivity of regression modelling. Tabachnick and Fidell (1989) recommend selecting independent variables which are strongly correlated with the dependent variable, but not with one another. The problem of using subscale scores is that many of the subscale scores making up a total score for an instrument show very high correlations with one another.

Implications of the Present Research

The current research produced mixed, and at times puzzling results. In the current study, the TAS again demonstrated satisfactory test-retest reliability ($r = .77$). This reliability over a mean interval of 98 days would tend to argue for the stable, more trait-like nature of alexithymia. Because of the high reliability demonstrated, the TAS does appear to measure a coherent construct which is stable over time. However, recently concerns about the internal factor structure of the TAS have been raised. The TAS has a four factor solution, with the third factor which measures daydreaming being unrelated to other factors. The factor structure of the TAS has some problems which have been noted in recent research (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994; Hendryx et al., 1991; Prince & Berenbaum, 1993).

Recent criticisms of the TAS have addressed concerns about the internal structure of the instrument. For instance, the first two factors are highly correlated and have several items that cross-load significantly on both factors, which raises the question of the independence of these two factors (Taylor, Ryan, & Bagby, 1985). As noted before, the items which

contribute to the factor which measures reduced daydreaming demonstrate low magnitude corrected item-total correlations with the full TAS score. The daydreaming factor is negatively correlated with the factor measuring difficulty identifying and distinguishing between bodily sensations and feelings. Haviland et al. (1991) found that the daydreaming factor and the factors measuring affect awareness and externally-oriented thinking were negatively correlated. These findings suggest that the items assessing daydreaming have little in common statistically or theoretically with other aspects of the alexithymia construct (Bagby et al., 1994).

Since these criticisms have come to light, the authors of the TAS have been working on revisions to the scale. The first revision, the TAS-R eliminated all of the items measuring imaginal activity. The four factor solution was reduced to a two factor solution in the TAS-R. Factor one was made up of items assessing both the ability to distinguish between feelings and bodily sensations accompanying emotional arousal as well as the ability to describe feelings to others. Factor two assessed externally oriented thinking. A further revision of the scale has recently (Bagby et al., 1994)

yielded the new TAS-20. This instrument is reported to have three factors, with the daydreaming or imaginal activity scale eliminated from the item pool. The authors report that the TAS-20, unlike the TAS-R uses questions from the original TAS, essentially eliminating the third factor. The factor structure is reported to be stable without any cross-loading of items between factors.

In light of these recent findings, the TAS as used in the present study is probably not as theoretically coherent a measure of alexithymia as previously anticipated. Yet, the TAS-20 has not been used in any published research and has just been described in the literature. This latest change in what and how alexithymia is measured certainly follows the complicated history of the construct of alexithymia. However, future research should closely follow psychometric advances in alexithymia research and should the TAS-20 prove to demonstrate convergent, discriminant, and concurrent validity, this instrument should be considered for use.

Likewise, using the HADS in a medically ill population to measure depression seems to eliminate the confound of the overlap of somatic symptoms related to

depression with somatic symptoms related to alexithymia. Previous research correlating alexithymia with depression and anxiety has used instruments such as the Beck Depression Inventory and the Symptom Check List-90 which have significant somatic symptoms as a part of their depression scales. Future research should seek to select instruments which avoid this overlap.

As discussed previously, multimethod research would enhance future studies. Rorschach measurement, Picture Arrangement, or other instruments to measure the experience and expression of affect would contribute to the convergent validity of what is so far a difficult construct to accurately and effectively measure. Also, incorporating a physiological measure of stress would enhance the study.

Future research should also address in more detail the relationship of coping to alexithymia. The present study conceptualized alexithymia as a defense which would be utilized for coping with overwhelming life-threatening illness. The idea was that alexithymia might be similar to the psychic numbing experienced by the victims of trauma. Future research into this hypothesis should diversify the instruments used to measure coping.

Summary

The current study sought to explore the affective sequelae of having a life-threatening illness. Hypotheses about the potential sequelae were tested. Findings suggest that patients with advanced cancer do indeed experience a high degree of stress consistent with other populations seeking treatment for stress related syndromes. Other findings suggest that anxiety and depression are significantly related to experienced stress.

The construct of alexithymia was examined and found to be related to stress as well as anxiety. Alexithymia was not significantly related to depression in this study, a finding which differs from previous studies. The variable which best predicts alexithymia was noted to be vigor, which was inversely related to the construct of alexithymia. Coping as measured by 'fighting spirit' was not found to be significantly related to alexithymia.

In conclusion, this exploratory study confirmed the initial hypothesis that stress and alexithymia are related. Causal inferences about how they are related are not possible from this correlational study. Future

studies, making use of experimental design should help to further causal reasoning in the study of secondary alexithymia as a response to trauma.

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APPENDICES

APPENDIX A

Stanford Oncology Psychosocial Questionnaire

Thank you for agreeing to fill out this questionnaire. The answers you provide will help us to better understand the difficulties that patients with cancer are experiencing. The results of this study will help us to design programs to better assist cancer patients. All information will be strictly confidential.

Socio-Demographic

- 1) When were you born? Month: _____
Day: _____
Year: _____

- 2) What is your religious affiliation (optional) Number _____
Letter _____
 - 1) Protestant (a-Methodist b-Presbyterian c-Lutheran
d-Episcopal e-Baptist f-other)
 - 2) Jewish (a-Reform b-Conservative c-Orthodox) _____
 - 3) How frequently do you attend church activities? _____
 - 1- daily
 - 2- one or more times per week
 - 3- one or more times per month
 - 4- one or more times per year
 - 5- less than once per year
 - 6- never
 - 4) What is your marital status? _____
 - 1- never married
 - 2- currently married
 - 3- separated
 - 4- divorced
 - 5- widowed
 - 6- living with a partner
 - 7- other
 - 5) How many children have you had? _____

 - 1) number of natural children
 - 2) number of adopted children
 - 3) number of step-children
 - 4) other
 - 6) What is your racial-ethnic background? _____

- 1- Asian
- 2- Black
- 3- Hispanic
- 4- Native American
- 5- White
- 6- Other
- 7- Refuse to Answer

- 7) How many years of education have you completed? _____
 Grade school=8
 Highschool=12
 AA/Technical=14
 BA=16
 MA=18
 PhD, MD, JD=20
- 8) Are you currently employed? Yes/No
- 9) If currently employed:
 1) Hours per week? _____
 2) Occupation? (please use guide) _____
- | | | |
|--------------|-----------------|--------------|
| 1) labor | 4) managerial | 7) trade |
| 2) technical | 5) professional | 8) other |
| 3) clerical | 6) housewife | 9) None; N/A |
- 10) If not currently employed, which of the following best describes your situation? _____
 1- not looking for work
 2- looking for work
 3- leave of absence
 4- retired
 5- medical leave or temporary disability
 6- permanently disabled
 0- N/A
- 11) If not currently employed, previous occupation if any (use above list) _____
- 12) What is the total annual household income before taxes? (optional) _____
- 1- Less than \$20,000
 - 2- \$20,000-\$39,000
 - 3- \$40,000-\$59,000
 - 4- \$60,000-\$79,000
 - 5- \$80,000-\$99,000
 - 6- \$100,000 and above
 - 7- Don't know
 - 8- Refuse to answer

Family and Friends

13) How many relatives and friends do you have that you feel close to (relatives and friends that you feel at ease with, can talk to about private matters, can call on for help)

R _____
F _____

Relatives

None
1 or 2
3 - 5
6 - 9
10 or more

Friends

None
1 or 2
3 - 5
6 - 9
10 or more

14) How many relatives or friends do you see at least once a month?

R _____
F _____

Relatives

None
1 or 2
3 - 5
6 - 9
10 or more

Friends

None
1 or 2
3 - 5
6 - 9
10 or more

15) How many people do you have near that you can readily count on for real help in times of trouble or difficulty, such as watch over children or pets, give a ride to the hospital or store, or help if you are sick?

R _____
F _____

Relatives

None
1 or 2
3 - 5
6 - 9
10 or more

Friends

None
1 or 2
3 - 5
6 - 9
10 or more

16 Do you belong to any of these kinds of groups? (Circle all that apply)

- | | | |
|---|---|---|
| a) A social or recreational group | Y | N |
| b) A labor union, commercial group, professional organization? | Y | N |
| c) Church group? | Y | N |
| d) A group concerned with children (PTA, Boy Scout, etc..) | Y | N |
| e) A group concerned with community betterment, charity or service? | Y | N |
| f) A support or therapy group? | Y | N |

g) Any other group, with which you have regular contact? Y N

17) How often do your close friends and relatives make you feel loved and cared for? Would you say: _____

1-Never 2-Rarely 3-Sometimes 4-Frequently 5-No Need 6-N/A

18) How often are these friends and relatives willing to listen when you need to talk about your worries or problems? Would you say? _____

1-Never 2-Rarely 3-Sometimes 4-Frequently 5-No Need 6-N/A

19) How satisfied are you with the kinds of relationships you have with your relatives and friends?
Would you say: _____

- 1- Not at all satisfied
- 2- Not very satisfied
- 3- Somewhat satisfied
- 4- Very satisfied
- 5- Completely satisfied
- 6- N/A

20) Is there any one special person you know that you feel very close and intimate with-someone you share confidences and feelings with, someone you feel you can depend on? _____

No Yes

21) How often do you get together with this one special person? _____

1-Daily 2-Weekly 3-Monthly 4-Several times a year 5-Once a year
6-N/A

22) How often do you feel these friends and relatives make too many demands on you?
Would you say: _____

1-Never 2-Rarely 3-Sometimes 4-Frequently 5-No Need 6-N/A

Your Health

23) Based on how you *feel*, overall, how do you rate your current level of health? _____

1-Excellent 2-Very Good 3-Good 4-Fair 5-Poor

24) Based on what you *know* about your health, would you say that your health is: _____

1-Excellent 2-Very Good 3-Good 4-Fair 5-Poor

25) How much bodily pain have you had during the past 4 weeks? _____

1-None 2-Very Mild 3-Mild 4-Moderate 5-Severe

26) Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health? _____

1-Yes

2-No

27) We are wondering if your health has limited you in each of the following activities?

Are you
currently
able to do
these?

If yes,
have you
engaged
in these
during the
last week?

a) The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports, etc....

Yes No

Yes No

b) The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling, etc...

Yes No

Yes No

c) Walking uphill or climbing a few flights of stairs

Yes No

Yes No

d) Bending, lifting, or stooping

Yes No

Yes No

e) Walking one block.

Yes No

Yes No

f) Eating, dressing, bathing, or using the toilet.

Yes No

Yes No

Sleep

28) Do you have a problem getting to sleep at night?

1-None

2-Slight

3-Moderate

4-Great

5-Severe

29) Do you have a problem because you wake up during the night?

1-None

2-Slight

3-Moderate

4-Great

5-Severe

30) Do you have a problem with waking up and getting up in the morning?

1-None

2-Slight

3-Moderate

4-Great

5-Severe

31) Do you have a problem with sleepiness during the day (feeling sleepy, struggling to stay awake in the daytime?)

1-None

2-Slight

3-Moderate

4-Great

5-Severe

Stressful Life Events

32) In the past four months which, if any, have occurred in your life. Put a check in the blank if any of these have happened in the past four months.

- | | | |
|-----------|--|-------|
| Death of: | mother | _____ |
| | father | _____ |
| | brother | _____ |
| | sister | _____ |
| | spouse | _____ |
| | lover | _____ |
| | child | _____ |
| | close friend or other important person | _____ |
-
- | | | |
|----------------------|----------------------------|-------|
| 33) Separation from: | spouse/lover | _____ |
| | other close family members | _____ |
| | very close friend | _____ |
-
- | | | |
|---------------|------------------|-------|
| 34) Change of | job/school | _____ |
| | living situation | _____ |
-
- | | | |
|-------------------------|--|-------|
| 35) Have you suffered a | miscarriage or abortion | _____ |
| | serious illness (other than your cancer diagnosis) | _____ |
| | serious accident or assault | _____ |
| | lawsuit | _____ |

For reasons not directly involving cancer care or treatment, during the past year, how many times have you:

- | | | | | | | | |
|---|---|---|---|---|---|-----------|-------|
| 36) --been an in-patient in a hospital? | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 37) --been an outpatient at a hospital or clinic? | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 38) --seen a health-care professional? | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 39) --missed days at work or working around the house? | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 40) --been ill (other than having cancer); # of days | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 41) --felt so poorly you could not really do anything productive? (# of days) | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |
| 42) --felt so poorly you spent the majority of the time in bed? (# of days) | 0 | 1 | 2 | 3 | 4 | 5 or more | _____ |

APPENDIX B

Short Name: TAS

Instructions:

Using the scale provided as a guide, indicate how much you agree or disagree with each of the following statements by selecting the number that corresponds to me most appropriate response: STRONGLY DISAGREE, MODERATELY DISAGREE, NEITHER AGREE OR DISAGREE, MODERATELY AGREE, STRONGLY AGREE. Please give an answer for every statement.

#: 1

When I cry I always know why.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 2

Daydreaming is a waste of time.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 3

I wish I were not so shy.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 4

I am often confused about what emotion I am feeling.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 5

I often daydream about the future.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree

5- Strongly Agree

#: 6

I seem to make friends as easily as others do. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 7

Knowing the answers to problems is more important than knowing the reasons for the answers. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 8

It is difficult for me to find the right words for my feelings. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 9

I like to let people know where I stand on things. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 10

I have physical sensations that even doctors don't understand. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 11

It's not enough for me that something gets the job done; I need to know why and how it works. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 12

I'm able to describe my feelings easily. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 13

I prefer to analyze problems rather than just describe them. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 14

When I am upset, I don't know if I am sad, frightened, or angry. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 15

I use my imagination a great deal. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 16

I spend much time daydreaming whenever I have nothing else to do. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 17

I am often puzzled by sensations in my body. _____

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 18

I daydream rarely.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 19

I prefer to just let things happen rather than to understand why they turned out that way.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 20

I have feelings that I can't quite identify.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 21

Being in touch with emotions is essential.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 22

I find it hard to describe how I feel about people.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 23

People tell me to describe my feelings more.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 24

One should look for deeper explanations.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 25

I don't know what's going on inside me.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

#: 26

I often don't know why I am angry.

- 1- Strongly Disagree
- 2- Moderately Disagree
- 3- Neither Agree or Disagree
- 4- Moderately Agree
- 5- Strongly Agree

APPENDIX C

Short Name: IES

INSTRUCTIONS:

EVENT: Having Cancer.

Below is a list of comments made by people about stressful life events and the context surrounding them. Read each item and decide how frequently each item was true for you DURING THE PAST 7 DAYS for the event described above.

#: 1
I thought about it when I didn't mean to. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 2
I avoided letting myself get upset when I thought _____
about it or was reminded of it.
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 3
I tried to remove it from memory. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 4
I had trouble falling asleep or staying asleep _____
because of pictures or thoughts that came into my mind.
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 5
I had waves of strong feelings about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 6
I had dreams about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 7
I stayed away from reminders of it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 8
I felt as if it hadn't happened or wasn't real. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 9
I tried not to talk about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 10
Pictures about it popped into my mind. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 12
Other things kept making me think about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 12
I was aware that I still had a lot of feelings _____
about it, but I didn't deal with them.
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 13
I tried not to think about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 14
Any reminder brought back feelings about it. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

#: 15
My feelings about it were kind of numb. _____
1- Not at all 2- Rarely 3-Sometimes 4-Often

APPENDIX D

Short Name: MAC

INSTRUCTIONS:

A number of statements are given below which describe people's reactions to having cancer. Please select the appropriate response following each statement, indicating how far it applies to you at present. For example, if the statement definitely does not apply to you, then you should select 1 for that statement.

#: 1

I have been doing things that I believe will improve my health, e.g..
changed my diet.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 2

I feel I can't do anything to cheer myself up.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 3

I feel that problems with my health prevent me from planning ahead.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 4

I believe that my positive attitude will benefit my health.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 5

I don't dwell on my illness.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 6

I firmly believe that I will get better. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 7

I feel that nothing I can do will make any difference. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 8

I've left it all to my doctors. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 9

I feel that life is hopeless. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 10

I have been doing things that I believe will improve my health,
e.g.
exercise. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 11

Since my cancer diagnosis I now realize how precious life is and
I'm
making the most of it. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 12

I've put myself in the hands of God.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 13

I have plans for the future, e.g. holiday, jobs, housing.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 14

I worry about the cancer returning or getting worse.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 15

I've had a good life, what's left is a bonus.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 16

I think my state of mind can make a lot of difference to my health.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 17

I feel that there is nothing I can do to help myself.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 18

I try to carry on my life as I've always done.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 19

I would like to make contact with others in the same boat. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 20

I am determined to put it all behind me. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 21

I have difficulty in believing that this happened to me. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 22

I suffer great anxiety about it. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 23

I am not very hopeful about the future. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 24

At the moment I take it one day at a time. _____

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 25

I feel like giving up. _____

- 1- Definitely does not apply to me.
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 26

I try to keep a sense of humor about it.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 27

Other people worry about me more than I do.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 28

I think of other people who are worse off.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 29

I am trying to get as much information as I can about cancer.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 30

I feel that I can't control what is happening.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 31

I try to have a very positive attitude.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 32

I keep quite busy, so I don't have time to think about it.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 33

I avoid finding out more about it.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 34

I see my illness as a challenge.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 35

I feel fatalistic about it.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 36

I feel completely at a loss about what to do.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 37

I feel very angry about what has happened to me.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 38

I don't really believe I had cancer.

- 1- Definitely does not apply to me
 - 2- Does not apply to me
 - 3- Applies to me
 - 4- Definitely applies to me
-

#: 39

I count my blessings.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 40

I try to fight the illness.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 41

I avoid talking about it to anyone.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 42

I deliberately push all thoughts of cancer out of my mind.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 43

Not thinking about it helps me cope.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 44

I make a positive effort not to think about my illness.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 45

I distract myself when thoughts about my illness come into my head.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 46

I don't think about my illness for days on end.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

#: 47

If friends or family talk about my illness, I change the subject.

- 1- Definitely does not apply to me
- 2- Does not apply to me
- 3- Applies to me
- 4- Definitely applies to me

APPENDIX E

HADS

Doctors are aware that emotions play an important part in most illnesses. This part of the questionnaire is designed to help us know how you are feeling. Ignore the numbers printed on the left of the questionnaire. Read each item and underline the reply which comes closest to how you have been feeling in THE PAST WEEK. Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought out response.

	A	I feel tense or 'wound up'	D		I feel as if I am slowed down
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
D		I still enjoy the things I used to enjoy	A		I get a sort of frightened feeling like 'butterflies' in the stomach
0		Definitely as much	0		Not at all
1		Not quite so much	1		Occasionally
2		Only a little	2		Quite often
3		Hardly at all	3		Very often
	A	I get a sort of frightened feeling as if something awful is about to happen	D		I have lost interest in my appearance
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take so much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
D		I can laugh and see the funny side of things	A		I feel restless as if I have to be on the move
0		As much as I always could	3		Very much indeed
1		Not quite so much now	2		Quite a lot
2		Definitely not so much now	1		Not very much
3		Not at all	0		Not at all
	A	Worrying thoughts go through my mind	D		I look forward with enjoyment to things
	3	A great deal of the time	0		As much as ever I did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
D		I feel cheerful	A		I get sudden feelings of panic
3		Not at all	3		Very often indeed
2		Not often	2		Quite often
1		Sometimes	1		Not very often
0		Most of the time	0		Not at all
	A	I can sit at ease and feel relaxed	D		I can enjoy a good book or radio or TV program
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not often	2		Not often
	3	Not at all	3		Very seldom

APPENDIX F

MEDICAL INFORMATION FORM

Please answer the following questions about your illness as best you can. If you do not know the answer to a question then estimate or leave the question blank. All information is confidential. Thank you.

- 1) What type of cancer do you have? (i.e. breast, colon, lung, etc...) _____.
- 2) When you received your initial diagnosis of cancer what stage of cancer did you have? (0, I, II, III, IV). _____.
- 3) What was the month, day, and year of your initial diagnosis? _____/_____/_____.
- 4) What is the current stage of your cancer? (0, I, II, III, IV). _____.
- 5) Have you had a recurrence of your cancer? (yes/no). _____.
- 6) If you have had a recurrence, what was the date of the recurrence? (month/day/year). _____/_____/_____.
- 7) What types of treatment have you received so far? Check all that apply:

Surgery _____
Chemotherapy _____
Radiation Therapy _____
Hormone Treatment _____
Bone Marrow Transplant _____
List other: _____

- 8) Who is your primary oncologist in the Knoxville area? _____.

APPENDIX G

Listed below are the abbreviations used throughout the dissertation for variable names.

BTAS	Baseline Toronto Alexithymia Scale
RTAS	Repeat Toronto Alexithymia Scale
BHADS	Baseline Hospital Anxiety and Depression Scale
BHADSD	Baseline Hospital Anxiety and Depression Scale-depression subscale
BHADSA	Baseline Hospital Anxiety and Depression Scale-anxiety subscale
BIESTOT	Baseline Impact of Events Scale -total score
RIES	Repeat Impact of Events Scale-total score
BIESAVO	Baseline Impact of Events Scale-avoidance subscale
BIESINT	Baseline Impact of Events Scale-intrusion subscale
BPOMVIG	Baseline Profile of Mood States-vigor subscale
BPOMFAT	Baseline Profile of Mood States-fatigue subscale

BPOMFAVI

Interaction variable created by

$(BPOMFAT) \times (BPOMVIG)$

BMACFS

Baseline Mental Adjustment to Cancer-

'fighting spirit' subscale

Vita

Jane G.Tillman was born in Chapel Hill, North Carolina. Following graduation from Chapel Hill Senior High School in 1979, Jane enrolled at the University of the South in Sewanee, Tennessee. Jane transferred to the University of North Carolina at Chapel Hill where she majored in zoology and religion, receiving the A.B. degree in 1983. Following graduation from college she worked full time for two years as a research assistant in the Division of Cardiothoracic Surgery at the University of North Carolina. In 1985 Jane enrolled in the Divinity School at Duke University. She received the Master of Divinity degree with a concentration in theology and ethics in September of 1987. In June of 1987 Jane became employed as a flight paramedic for Carolina Air Care at the North Carolina Memorial Hospital. In August of 1990 Jane enrolled in the doctoral program in clinical psychology at the University of Tennessee. Following completion of her internship at Dartmouth Medical School on June 30, 1995, she will receive the Ph.D. degree from the University of Tennessee.