Life stress problem-solving ability and psychological distress

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LIFE STRESS, PROBLEM-SOLVING ABILITY AND 

PSYCHOLOGICAL DISTRESS

By

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ABSTRACT

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Life Stress, Problem-Solving Ability and Psychological Distress

Director: Herman A. Walters, Ph.D.

The purpose of this study was to examine the role of problem-solving ability as a possible moderator of the detrimental effects of life stress. Eighty college undergraduates were identified as possessing either poor or effective problem-solving skills on the basis of scores obtained on the Means-Ends Problem-Solving Procedure. The Life Experiences Survey was utilized as a measure of self-reported positive and negative life change occurring within the past twelve months. In addition, all subjects were administered the Beck Depression Inventory and the State-Trait Anxiety Inventory. It was predicted that subjects possessing poor problem-solving skills who reported high levels of negative life change would be more depressed and anxious than subjects demonstrating proficient problem-solving skills.

The results of the present investigation failed to find problem-solving ability, as measured by the Means-Ends Problem-Solving Procedure, to be an essential moderator of life stress. The predicted interaction among high/low problem-solving ability x positive/negative life change x high/low life change did closely approach significance with respect to the Beck Depression Inventory, however, suggesting that problem-solving ability, or more generally, interpersonal coping ability, does exert a moderating influence upon the depressive effects of life stress. Implications for prevention and treatment of the detrimental effects of life stress are discussed, in addition to directions for future research.
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CHAPTER I

INTRODUCTION

The effects of psychological and social stress upon mental and physical health has received increasing attention in the two decades following Selye's pioneering research in the area of life stress (Selye, 1956). The major portion of this research has been based upon the theoretical assumption that life stress is a result of total life change, whether desirable or undesirable in nature. Recently, researchers have begun to question this conceptualization of life stress which combines life events which exert a positive impact upon the individual (e.g. marriage, birth of a child, promotion) and life events which influence a person in a negative direction (e.g. divorce, death of spouse, loss of a job) (Brown, 1974; Mechanic, Rabkin & Struening, 1976; Sarason, De Monchaux & Hunt, 1975; Sarason, Johnson & Siegel, 1978). The purpose of this study is twofold: 1) to investigate the hypothesis that life stress is a result of experiencing negative life events as opposed to positive life events, and 2) to study the role of problem-solving ability as a possible moderator of the effects of life change.

The Effects of Life Stress on Psychological and Physical Health

Researchers investigating human stress, life crises, or major life changes have consistently demonstrated a positive relationship

Life stress has been implicated in the etiology of a large number of physical illnesses including multiple sclerosis, tuberculosis, diabetes, and myocardial infarction (Johnson & Sarason, in press-a). Rahe, Meyer, Smith, Kjaer, & Holmes (1964) investigated the onset of disease in a sample of employees at a tuberculosis sanitorium who later developed tuberculosis on the job. This group was compared to an individually matched control sample of healthy employees. Using the Schedule of Recent Events (SRE) (Holmes & Rahe, 1967), a questionnaire concerned with the timing and quantity of social stressors, the investigators were able to demonstrate that the single differentiating feature between the two groups was the temporal pattern of social stresses experienced in the ten years prior to the onset of tuberculosis. Their results showed that the tuberculous group evidenced increased evidence of social stresses in the last two of the ten premorbid years (p<.02). Similarly, Holmes
(1970) used the SRE and the Social Readjustment Rating Scale (Holmes & Rahe, 1967), a questionnaire primarily concerned with the magnitude of experienced stressful events, to study the life style of 199 hospitalized patients. Using the above measures, both a quantitative and qualitative social history was obtained for each patient. The results indicated that life changes were reported more frequently by the patients in the 0 to 5 years prior to hospitalization than in the 6 to 10 previous years. In the 0 to 5 year period, the average frequency of each item was nearly twice that of the 6 to 10 year period. Sex differences were not found, but both marital status and age were salient factors. Widowed patients experienced approximately fifty percent fewer life changes than single, married, divorced or separated patients. Unfortunately, the researchers did not control for age of these patients. When investigating age specifically, results indicated that patients between the ages of twenty to thirty years exhibited about fifty percent more life events per patient than those individuals between forty-five and sixty years of age, and two hundred percent as many life changes as those over the age of sixty. It is highly likely that this age factor is partially responsible for the findings due to marital status, as widowed individuals are usually older as a group than married, divorced, separated or single persons.

In an innovative study examining the relationship between high school teacher performance and life stress, Carranza (1972) found a significant positive correlation between life change magnitude and teacher absenteeism due to injury and illness. A significant
negative correlation was found between the degree of life change and post graduate education obtained by the teacher beyond the B.A. Carranza concluded that a high degree of life stress adversely affects teaching effectiveness.

Rahe, McKeen, and Arthur (1967) studied life change and illness patterns by randomly selecting health records of fifty Marine and Navy personnel who were disabled and separated from the service for psychiatric illness. The researchers longitudinally analyzed total illness experience and compared these results to previously acquired data of illness patterns of American working men obtained by Hinkle, Pinsky, Bross, and Plummer (1965). Changes in life patterns which were recorded in each man's medical record or psychiatric social history were also analyzed. Each year of active duty was separately scaled according to severity and number of life changes. Illnesses were also scaled and summed. Both illnesses and life events were observed to cluster during certain years. Their results indicated that, in general, a cluster-year of life changes occurred immediately before an illness or cluster of illnesses. An important additional finding was that more serious illnesses were preceded by cluster years of greater life-change intensity than years prior to minor illnesses. Their data revealed one instance of near-death and two deaths being preceded by clusterings of high life-change magnitude. In retrospective studies conducted in Sweden by Rahe and his colleagues a positive relationship was found between mounting life change and sudden cardiac death (Rahe & Lind, 1971) and time of onset of
myocardial infarction (Rahe & Paasikivi, 1971; Theorell & Rahe, 1971). Stress has also been linked with pregnancy and birth complications (Nuckolls, Cassell & Kaplan, 1972) as well as the displaying of symptoms in individuals suffering from chronic illness (Wyler, Masuda, & Holmes, 1971).

Hinkle's research, including his previously-mentioned study of 1527 American working men, indicates that illness among a group of people is nonrandomly distributed (Hinkle, Christenson, Kand, Ostfeld, Thetfords, & Wolf, 1958; Hinkle, Pinsky, Bross & Plummer, 1965; Hinkle & Wolf, 1957). These studies found that nearly fifty percent of illness was experienced by only twenty-five percent of the individuals studied. In addition, the healthiest quartile of the sample experienced only ten percent of the total number of illness episodes. An interesting corollary is that an individual's illness episodes are also nonrandomly distributed over time. The working men's health records, extended up to twenty-five years in time in many cases, demonstrated that nearly ninety percent of the men had experienced at least one cluster-year of illnesses. Although only one year out of ten was a cluster-year, thirty-four percent of all illness episodes were exhibited during these cluster-year time periods.

Not only has the magnitude of life stress been found to correspond to time of illness onset, but it has been shown to relate to the seriousness of disease. Holmes and Masuda (1974), using the SRRS, found a strong positive correlation between magnitude of life
change and seriousness of disease in individuals with chronic illnesses. Primary health changes that they observed covered a wide range of physical and psychological illnesses. These researchers also investigated the relationship between life stress magnitude in the years before the onset of illness and the severity of the disease. Since there existed no satisfactory scale to assess the severity of disease, Wyler, Masuda and Holmes (1968) devised one using a method similar to that used with the SRRS. Two separate samples of physicians rank ordered one hundred twenty-five diseases. Using this Seriousness of Illness Rating Scale, Wyler, Masuda and Holmes (1971) compared seriousness of illness to the magnitude of life change that patients had experienced in the two years preceding onset of their illness. The correlation between life-change magnitude and severity of disease was highly significant for chronic diseases; however, no significant relationship was found for acute infectious diseases. The results of these studies indicate that the greater the magnitude of stress and accompanying adaptive changes, the greater the vulnerability to disease and the more serious the illness that ensues (Holmes & Masuda, 1974).

Rahe (1972) studied 194 single, young, navy underwater demolition team trainees and concluded that life event data was an effective predictor of relatively severe illness but not of minor illness. He found that major rather than minor illness resulted from a greater number of life events (as opposed to fewer events of greater magnitude each) necessitating a higher degree of adjustment.
Although researchers have not been able to provide information linking specific disease type to specific forms of stress, life change appears to be implicated in the etiology of illness in general (Graham & Stevenson, 1963).

Several investigators have hypothesized that stressful situations threaten the well-being or security of an individual and promote the need for adaptive behavior. These life changes also result in physiological alteration of the body's homeostasis. If these changes are of sufficient magnitude or if they are long term in nature, they may increase the organism's vulnerability to disease. In short, environmental stresses that sufficiently alter the steady state of the person enhance the likelihood that resistance to disease will be lowered (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964).

More recently, the study of life stress has included its relationship to psychiatric symptomatology. Life events have been found to correlate with a number of symptoms, including depression, aggression, neuroticism, social maladjustment, suicidal ideation, and paranoia (Dekker & Webb, 1974; Johnson & Sarason, in press-b; Sarason, et al., 1978). Paykel, Myers, Klerman, Lindenthal, & Pepper (1969) matched a sample of one hundred eighty-five depressed patients with respect to sex, marital status, age, race, and social class with subjects from an epidemiological community survey. The magnitude of life stress in the six months preceding the onset of depression was compared to a six month period for the control population. Life events information was obtained several weeks after symptomatic
improvement in order to decrease distortion. Depressed patients reported approximately three times as many life events as the matched controls. More specifically, the experimental population was distinguished from the control population by an excess of undesirable life events and events involving losses or exits from the social field (child married, divorce, departure of family member from home, etc.). The depressives did not report an excess of desirable events or entrances to the social field (marriage, birth of a child, etc.). The authors concluded that the desirability of life change is an important factor in the relationship of life change to depression. This issue will be discussed in more detail in a later section of this prospectus.

In a related study, Paykel, Prusoff & Myers, 1975, investigated the relationship between life events and suicide attempts. Individuals who had unsuccessfully attempted suicide and were admitted to the emergency room of Yale New Haven Hospital were matched with respect to marital status, sex, age, race, and social class with both depressed and general population controls. Life event information covering the six months prior to admission was obtained within one week of the attempted suicide. The study determined that suicide attempters reported fifty percent more events than the depressed controls and four times as many events as the normal controls. Attempters evidenced an excess of undesirable events over both control groups, but not of desirable events. Interestingly, suicide attempters did not report more exits from their social field,
but instead reported more entrances to their social field than the depressed group. Whereas in the earlier study a specific relationship was found between exits and depression, entrances to the social field were as highly related to suicide attempts as exits. When the life events were grouped according to perceived level of impact (Paykel, Prusoff, & Uhlenhuth, 1971), depressives related experiencing more events of minor, intermediate and major natures than the nondepressed controls. Suicide attemptors experienced an even greater number of major and intermediate stressful events, but did not report an excess of minor events. In addition, whereas depressives reported a greater number of self-controlled life events (e.g. marriage), suicide attempters evidenced more uncontrollable life events (e.g. illness) than depressives, but no more controllable events.

Paykel (1974) compared first admission schizophrenics to general population controls and found that rates for exits from the social field, undesirable events, and overall number of life events were significantly greater for the first admission schizophrenics. In studying neuroticism and life stress, symptoms were found to increase with increased severity of preceding stress, resulting in a linear relationship (Uhlenhuth & Paykel, 1973).

In a related area of sociological research, it has been found that serious criminal offenses are often preceded by periods of life crisis (Szyrynski, 1968). Family crisis has been implicated in the etiology of childhood behavior disorders (Pavenstedt & Bernard, 1971). Numerous researchers have documented the role of stress in
making some individuals more likely to develop alcoholism, and rapid social change has been correlated with definite increases in the incidence of alcoholism and drug abuse (Coleman, 1973).

Myers, Lindenthal and Pepper (1974) randomly selected a sample of 720 individuals from a metropolitan sample of 72000 citizens. Their data indicates that lower class subjects experienced more unpleasant events of greater impact than did subjects in higher social strata. When analyzed in terms of psychological impairment, these unpleasant events were related to increased symptomatology. Dohrenwend (1973) investigated the role of ethnicity in the experiencing of life change. He concluded that his Puerto Rican and black minority populations exhibited higher levels of life change and psychopathology than members of more advantaged ethnic groups. His results indicated that ethnicity, per se, did not increase the incidence of life change further than that already imposed by low social status.

Justice, McBee and Allen (1977) studied the relationship between social functioning and life stress in a mental health center population. They found high degree of life change to be related to
1) impairment in relations with family, friends and neighbors,
2) disruptions in household management, financial security, disciplining of children and work efficiency, and
3) use of alcohol and other drugs. Marked increases in social isolation and personality disruptions were also correlated with highly stressful events.

In summary, symptoms of psychological and physical impairment have been associated with marital, occupational, personal, economic,
social, family and interpersonal life stress (Justice, McBee & Allen, 1977; Rahe, 1972). Changes in impairment levels of individuals already exhibiting psychological and physical symptoms following life stress have been reported (Myers, Lindenthal, Pepper & Ostrander, 1972; Myers, Lindenthal & Pepper, 1974, 1971). Lower social class has been associated with higher levels of both life change and psychopathology (Dohrenwend, 1973; Myers, Lindenthal, & Pepper, 1974). The nature of the events that appear to especially contribute to symptoms of distress include exits from the social field (Myers, Lindenthal, Pepper, & Ostrander, 1972; Paykel, 1974), uncontrollable events (Paykel, 1974), and undesirable events (Paykel, Myers, Klerman, Lindenthal and Pepper, 1969; Vinokur and Selzer, 1975).

As Johnson and Sarason (in press-b) note, the majority of studies in the area of life stress have been correlational in nature. Conclusive cause and effect interpretations, therefore, cannot be made. These researchers comment:

> Even though it seems reasonable to expect that life stress may have a detrimental effect on the health and adjustment of individuals, significant correlations may be obtained for other reasons. It may be that persons with problems of health and adjustment simply tend to experience greater degrees of life change or that both life stress and problems of health and adjustment simply tend to covary with some third variable. (p. 5).

Although some research directed at investigating the influence of life change has resulted in data consistent with the hypothesis that life stress is causally related to health problems (Johnson & Sarason, in press-b; Vossel & Froehlich, Note 1), these findings must be regarded as tentative.
Assessment of Life Stress

In order to fully understand the implications of research involving life stress it becomes important to consider the measures of life change that have been utilized and those underlying assumptions upon which their construction is based. The Schedule of Recent Experiences (SRE) is the most commonly used of these instruments, and was developed by Holmes and Rahe (1967). The SRE is a self-report questionnaire consisting of forty-three life events which the authors determined to be frequently experienced by individuals before the onset of illness. Subjects are instructed to endorse those items that they have experienced during the time span that the experimenter specifies (typically the previous six months to one year). In order to assign weights to the various life events, Holmes and Rahe asked subjects to rate each event according to the amount of readjustment s/he felt that the event necessitated. The item "marriage" was used as an anchor point for these ratings, and mean values were calculated for each of the forty-three items. These mean values, or weights, that were originally assigned to each life event are summed to determine the total life stress score of the SRE.

The SRE was later revised and renamed the Recent Life Change Questionnaire (Rahe, 1976), however, this measure is not widely used. The Social Readjustment Rating Questionnaire (SRRQ) was developed soon after the SRE, using extensive population ratings of social readjustment required after experiencing SRE life events (Harmon, Masuda & Holmes, 1970; Masuda & Holmes, 1967a; Masuda & Holmes,
1967b). Again, these mean population estimates are summed to yield a total life change score.

The above measures are based upon the assumption that life change is stressful regardless of the desirability of the event experienced. A major theoretical question involves the validity of combining positive and negative events, and the SRE and SRRQ have been criticized for this reason (Brown, 1974; Mechanic, 1975; Sarason, De Monchaux, & Hunt, 1975). It seems reasonable to predict that negative life events (e.g. divorce or death of a close family member) exert a more harmful influence upon an individual than positive life events (e.g. marriage, or birth of a child).

Paykel, Prusoff, and Uhlenhuth addressed this issue when they constructed their self-report questionnaire (Paykel, Prusoff, and Uhlenhuth, 1971; Paykel and Uhlenhuth, 1972). These investigators share the belief with the Holmes and Rahe group that there exists a common core of stressfulness in the occurrence of life events that can be assessed meaningfully across individuals (Hurst, Jenkins, & Rose, p. 127). Their measure also applies population estimates of either distress or adjustment to those events endorsed by the subject. Whereas Holmes and Rahe theorize that the stressfulness of an event is determined by the amount of readjustment necessary to adapt to the event (Harmon, Masuda, & Holmes, 1970; Masuda & Holmes, 1967a, 1967b; Rahe, 1976), Paykel, Prusoff and Uhlenhuth emphasize the degree of emotional upheaval created by the event and especially
focus upon the desirability of the event (Paykel, et al., 1971; Paykel & Uhlenhuth, 1972; Uhlenhuth & Paykel, 1973).

A number of studies have been undertaken in order to clarify the total life change versus negative life change issue. Gersten, Langner, Eisenberg, and Orzeck (1974) studied psychological impairment in 674 children and young adults. Psychiatrists interviewed the mothers of these individuals in order to rate the children's psychopathology. These investigators constructed a life change scale based upon Coddington's research with junior high and high school students (Coddington, 1972). Results of this study showed anxiety to be the only factor which responded to total life change rather than undesirable life change. Findings in all other areas of problem behavior, including self-destructive tendencies, conflict with parents, fighting, isolation, and delinquency, strongly support the conclusion that undesirability is a more effective operational measure of stress than amount of change per se. These researchers explain the contradictory anxiety finding by pointing out that anxiety is frequently the initial response of an individual confronted with any sudden stimulus change, complex task, new situation, etc. regardless of the positive or negative quality of the change. They view delinquency to be the most salient area for discussion. Delinquency is emphasized due to the finding that it is one of the few childhood behavior problems that holds predictive power for future adult impairment in such areas as character disorders, sociopathy, and other non-neurotic forms of adult psychopathology.
Dohrenwend comments that early methodological inquiries into life stress measures concluded that "life change rather than desirability is the characteristic of life events that should be measured for the more accurate assessment of their stressfulness" (Dohrenwend, 1973a, p. 174). He points out, however, that these conclusions were based upon comparisons of measures that were partially confounded. Vinokur and Selzer (1975) similarly concluded that the majority of these studies utilized symptom measures that provided only crude measures of mental health. In their study they used specific measures of tension, anxiety, aggression, depression, suicidal proclivity and paranoid thinking. The desirable and undesirable event scores were separated and correlated independently with the stress-related variable, eliminating the confounding of measures. Their results showed that "only the undesirable life events were consistently, significantly and substantially correlated with a variety of stress-related measures". They commented further that "The former conclusion should be reversed: Stressful life events should be conceptualized and measured in terms of undesirability" (Vinokur & Selzer, 1975, p. 336).

Paykel, Myers, Dienelt, Klerman, Lindenthal and Pepper (1969) found undesirable events to be more frequently reported by depressives than normal controls, and concluded that the directionality of life change must be considered in addition to its magnitude. Other studies designed to examine the desirable and undesirable change dimension have consistently found negative but not positive change
to be significantly related to dependent measures assessing the effects of stress (Johnson & Sarason, in press-a; Mueller, Edwards, & Yarvis, 1977; Sarason et al., 1978). Sarason et al. (1978) found depression, anxiety, neuroticism, and hypochondriasis to be significantly correlated with amount of negative life change but not with positive life change.

Another major criticism of the Holmes and Rahe SRE is that it employs normative weights for each event rather than allowing for individual ratings of perceived stressfulness. Hurst, Jenkins, and Rose (1978) examined both self-ratings and normative weights assigned to life events in a sample of air traffic controllers. Self-ratings of stressfulness and normative weights were not highly correlated. Results also showed total scores based upon normative weights to be highly correlated with the number of life events experienced, while total scores based upon self-ratings and the number of life events were correlated at a much lower level. These investigators conclude that standardized, weighted scores "reflect more on how many life changes are experienced than on the impact, or strain, of those life events. Life change scores based on individuals' ratings seemingly reflect more on the impact of life events than on the quantity that have occurred" (Hurst, Jenkins, and Rose, 1978, p. 139). The findings of their study imply that this may constitute one reason why life change scores using individualized ratings have proved more productive in prospective research than life change scores based upon normative weight totals that have been
typical of retrospective studies (Dohrenwend, 1973; Dohrenwend &
Dohrenwend, 1973; Goldberg & Comstock, 1976; Horowitz, Schaefer, &
Looney, 1974; Hurst, et al., 1976; Lundberg, Theorell, & Lind, 1975;
Rabkin & Struening, 1976; Rahe, 1973; Rubin, Gunderson & Arthur,
1969, 1971). It may be that assessments which rely upon self-
reported ratings may better reflect actual psychological and physical
stress that is experienced whereas assessment employing normative
scores may reflect primarily the possibility of stress rather than
its actual presence (Hurst et al., 1978). Sarason et al. (1978)
found negative individual ratings of life change to be more highly
correlated with dependent measures of depression, personal maladjust­
ment, and social maladjustment than ratings based upon normative life
change scores. Similar results were obtained by Pancheri and
DeMartino (Note 2) using dependent measures assessing physical
illness.

The Life Experiences Survey (LES) (Sarason, Johnson, & Siegel,
1978) was developed with the intention of providing a measure of
life stress that would not possess the methodological flaws inherent
in the SRE. The LES is a self-report questionnaire consisting of
forty-seven general items, three blank spaces in which the individual
can list additional events, and ten items directed specifically at
the student population. Respondents are asked to indicate those
events that they have experienced in the past twelve months. Thirty-
four of the LES items are similar in content to those used in the SRE,
however, the items are less ambiguous in the LES. For example, for
the item pregnancy, the LES allows both men and women to endorse this event (i.e., females rate their own pregnancy; males rate their wife's/girlfriend's pregnancy). Nine of the ten academically oriented events are unique to the LES.

The LES allows subjects to rate the impact and desirability of those events that the individual has undergone. Respondents are instructed to indicate whether the event was viewed as negative or positive and to rate the perceived impact of the event at the time of its occurrence. Possible ratings range on a seven point scale from extremely negative (-3) to extremely positive (+3). This method of scoring allows for the separate assessment of negative, positive, and total change. Each of these is obtained by summing the appropriately valenced ratings. In more recent studies employing the LES, total change score has not been utilized, as it has been found to be less predictive than the negative change index (Johnson, note 3).

Several preliminary investigations of the LES have been reported using a college student population (Sarason & Johnson, 1976). The first study found no significant differences between males and females on any of the three life change indexes. The results of this and other early studies indicate that the positive and negative life change scores are essentially uncorrelated (Sarason, et al., 1978). In two test-retest reliability studies of the LES with five to six week intervals, Sarason et al. (1978) reported reliability coefficients .19 and .53 (p<.001) for the positive change score, .56 and .56 (p<.001) for negative change score, and .63 and .64 (p<.001) for total
change score. The LES, then, appears to be a moderately reliable measure especially with respect to negative and total change scores. The test constructors comment that these test-retest reliability coefficients are likely to underestimate the instrument's reliability due to the fact that subjects may experience a variety of life events in the time interval between testing and retesting. The authors argue that the score differences may reflect actual life changes rather than inconsistencies in reporting. Objective behavioral indices that these life changes did actually take place, however, remain to be obtained.

The authors report several correlates of life stress that they have found using the LES. In a study undertaken with 100 college undergraduates, these researchers administered the LES, the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970), and a short form of the Marlow-Crowne Social Desirability Scale (Strahan & Gerbasi, 1972) to the subjects in addition to obtaining their academic transcripts. Results indicated that total and negative change scores correlated significantly and in a positive direction with state and trait anxiety, however, positive change was not significantly correlated with either measure. Both negative and total change scores were correlated with grade point averages at significant levels. Sarason, Johnson and Siegel also report finding similar significant negative correlations between negative life change scores and anxiety in two studies employing naval personnel and college students (1978).
In order to study the relationship between life stress and personal maladjustment, the LES and the Psychological Screening Inventory (PSI) (Lanyon, 1970, 1973) were administered to college undergraduates. Results of this investigation showed negative change to be significantly related to maladjustment. The researchers comment that these findings provide further support for the conceptualization of life stress in terms of negative change. Negative change has been found to be significantly and positively correlated with depression, as measured by the Beck Depression Inventory (BDI) (Beck, 1967) and with external locus of control as measured by the Internal External Locus of Control Scale (Rotter, 1966). University counseling center clients also exhibited significantly higher negative change scores than those subjects in two normal comparison groups.

Another study was designed to test the sensitivity of the LES to instructional manipulation (Sarson & Johnson, 1976). Subjects in the experimental group were instructed that the LES was designed to identify the likelihood of developing psychological and physical problems and that high scores indicated a greater probability of future difficulties. The manipulation resulted in significantly lower positive and total change scores, however, the negative change score was unaffected.

The LES, then, has been found to possess sufficient reliability and to correlate with a number of relevant dependent measures. By
allowing for the separate assessment of positive, negative, and total change, and for individualized ratings of impact, the LES appears to be superior to any life stress measure developed thus far.

**Moderator Variables**

The magnitude of relationships between life stress measures and the numerous dependent variables reported earlier have generally been low, with correlations in the .20 to .30 range. This leads to the conclusion that life change per se accounts for a fairly small proportion of variance in the dependent measures (Johnson and Sarason, in press-b). Although it is of theoretical interest to demonstrate that life changes occur more frequently preceding the onset of various illnesses than they occur in control populations this knowledge by itself is of little practical use. Many individuals undergo tremendous stress without becoming ill, whereas others become ill without any identifiable life changes (Dohrenwend and Dohrenwend, 1974).

One possibility for this puzzling interaction is that there exist moderator variables which mediate the impact that life stress has upon the individual. Several prominent researchers in the area of life stress have pointed out the deficit of studies investigating the role of such moderator variables (Dohrenwend and Dohrenwend, 1974; Johnson and Sarason, in press-b; Rabkin and Struening, 1976).

Langner and Michael (1963) conducted an early study that investigated the relationship between social class and psychopathology. Before this time the commonly held assumption for the
relatively high levels of psychological disturbance typically found in lower socioeconomic status populations was that there existed a higher degree of life stress in the lower SES groups. Unexpectedly, the researchers found that the differences among average stress scores of the different SES groups was negligible. They did find, however, that at every level of stress, the lower SES subjects were at a higher risk of psychopathology. The researchers hypothesized that although the differences among average life stress scores were very small, the lowest SES group may lack the degree of social support and other resources that the higher SES groups have which serve to buffer the stressors.

Nuckolls, Cassel, and Kaplan (1972) investigated the role of psychosocial assets in pregnancy and birth complications. The researchers administered the Holmes and Rahe (1967) Schedule of Recent Experience and a specially devised Psychosocial Assets measure in the subjects' thirty-second week of pregnancy. The Psychosocial Assets measure primarily assessed the degree of social support that the individual reported as having in their environment, including relationships with husband, extended family, and community. The women were categorized as having 1) high or low psychosocial assets, and 2) high or low life stress. When analyzed alone, neither the psychosocial assets score nor the life change score was significantly related to pregnancy and birth complications. When considered jointly, however, the results indicated an interaction in that ninety-one percent of the women with high life stress and low psychosocial
assets had one or more complications whereas only thirty-three percent of the women with high stress scores and high psychosocial assets scores had complications.

In another innovative but simple study, de Araujo, Van Arsdel, Holmes, and Dudley (1973) used adult asthmatics as their experimental population. They investigated the relationship between psychosocial assets, stress, and the amount of adrenocortico-steroid medication that was needed to control their asthmatic symptoms. They employed the Berle Index (Berle, Pinsky, and Wolf, 1952) to measure social support. The high stress-low social supports group required a significantly larger dosage of medication than the other groups. The results of this study indicate that social support may serve to mediate the asthma-producing effect of stress.

Andrews, Tennant, Hewson, and Valliant (1978) investigated the influence that social support, coping style, and life stress had upon psychological impairment. Although these researchers failed to find an interaction between life change and social support, their data showed both variables to be independently related in an additive manner to psychological impairment. Low levels of life stress and high levels of social support were found to be related to a decreased risk of disturbance, whereas high levels of life stress and low levels of social support were related to increased risk of psychological impairment. Although this study did not find an interaction between life stress and social support, it did point to social support as an important factor in psychopathology.
Eaton (1978) similarly studied the effect of social support upon stress and psychological symptoms. He grouped subjects according to their mode of living: 1) married or not living alone (high social support), and 2) unmarried or living alone (low social support). His results indicated that the relationship between stress and symptoms was significantly greater in those individuals who were low in social supports than in those subjects with a high level of social support. Again, this study points to the possibility that social support serves to moderate the negative effects of life change.

It appears, then, that high levels of social support may moderate the effects of life stress. This may have far-reaching preventative implications, as Dean and Lin (1977) suggest. Although people cannot avoid stress entirely, it might be beneficial to train stress-prone individuals in social skills, thereby enabling them to better mobilize social support in times of need.

Recently, Smith, Johnson, and Sarason (1978) investigated the possible stress mediating variable of sensation seeking. These researchers predicted that individuals with a high tolerance for arousal (high sensation seekers) would be less affected by life changes than those with a low tolerance for arousal (low sensation seekers). Their rationale was that individuals in the high sensation seeking category were "better able to deal with increased arousal brought about by the experiencing of such changes" whereas "life change might have a negative effect on persons low in sensation seeking, as they presumably are less able to cope with arousing stimulus input"
These researchers administered the LES, (Johnson & Sarason, 1978), the Sensation Seeking Scale (Zuckerman, Kolin, Price, & Zoob, 1964), and the Discomfort Scale of the Psychological Screening Inventory (Lanyon, 1973) which is a self-report measure of neuroticism. Results showed positive change to be unrelated to the dependent measure for both low and high sensation seekers. Subjects who were low in sensation seeking and who had experienced negative life change had significantly greater discomfort scores than those in other groups.

A similar study investigated the relationship between LES scores and measures of depression, hostility and anxiety as a function of arousal seeking (Johnson, Sarason & Siegel, 1978). College student subjects completed the LES, the Mehrabian and Russell (1973) Arousal Seeking Scale, and the Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1965). Results indicated that positive life change was not related to the dependent measures in either the high or low sensation seeking groups. Negative life change, however, was significantly related to both hostility and anxiety in the low sensation seeking group. The authors concluded the following:

Life changes are related to psychological distress only if the individual perceives them to be negative, and the sensation seeking motive influences the relationship between negative life change and psychological distress (Smith, Johnson, & Sarason, 1978, p. 348-349).

Arousability has been studied as a possible moderator of stress (Mehrabian & Ross, 1977). These researchers administered an illness inventory, a measure of stimulus screening (to assess arousability)
and a measure of life change. Those individuals who scored high on
the stimulus screening inventory are assumed to attend primarily to
those stimuli they deem most important and thus experience lower
levels of arousal. Nonscreeners, on the other hand, attend less
selectively to a greater number of potentially arousing events and
so are more prone to higher levels of arousal. Mehrabian and Ross
predicted that nonscreeners would be affected more adversely by life
change events than would the screeners. Results of this investigation
showed significant main effect differences between screeners and
nonscreeners with the nonscreeners evidencing a greater number of
psychosomatic symptoms. In the instance of high life change, screeners
reported significantly fewer illnesses than nonscreeners. It would
appear from this study that level of arousability may mediate the
extent to which individuals are affected by life stress.

Locus of control and its mediating effects upon stress has been
extensively studied using both animal and human populations (Averill,
1973; Lefcourt, 1973). From those studies involving humans it
appears that stress (e.g., electric shock, excessive noise) is per-
ceived as being more aversive when it is not within one's control
than when it is controllable. This is true even when the control is
voluntarily not exercised (Glass, Singer, & Friedman, 1969; Staub,
Tursky, & Schwartz, 1971). The studies in this area generally
indicate that the perception of controllability is a salient moderator
of the stressfulness of aversive stimuli (Geer, Davidson, &
Johnson and Sarason, (1978) administered the LES, the Locus of Control Scale (Rotter, 1966), the State-Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1970), and the Beck Depression Inventory (Beck, 1967), to a sample of college students. Their results showed that for externally oriented subjects negative life change (as measured by the LES) was significantly related to depression and trait anxiety. The researchers concluded that life stress has a greater detrimental effect upon those individuals perceiving themselves as exerting little control over their environment (Johnson & Sarason, 1978).

From the research reviewed herein it appears that the role of moderator variables is an important area for further investigation. It has long been noted that stress does not affect all individuals in the same way, and support for the concept of stress-mediating variables has been cited in studies concerning locus of control, stimulation seeking, social supports and level of arousability. There are a number of other variables which may prove to influence the effects of life stress. Dohrenwend and Dohrenwend (1978) hypothesize that prior experience with specific stressors may lead to habituation such that future similar events are less traumatic. Animal research tends to support this hypothesis, as Denenberg (1964) reviewed several studies which concluded that early exposure to such noxious stimuli as electric shock leads to a decrease in reactivity to similar stimuli applied later in life.
Johnson and Sarason (in press-b) comment that "prior experience may be most important because it leads to the development of coping skills" (p. 20). They suggest that further research using objective measures of coping ability is much needed. These well-known investigators concluded that:

Life change is not a synonym for stress. Life changes mean different things to different people. Whatever it is that makes for differentness among people mediates between events and responses to them. Moderator variables influence how a given event will be experienced, felt, and dealt with. Identifying and developing methods of reliably measuring relevant moderators would seem to be a major task facing life stress researchers (Johnson & Sarason, in press-b, p. 23).

**Problem Solving**

Most of the research concerning problem-solving cognition has been concerned not with interpersonal situations but with impersonal tasks such as anagrams, syllogisms, puzzles, etc. (see reviews by Davis, 1966; Spivack & Shure, 1973). Recently, investigators have become interested in the interpersonal problem-solving aspect of coping ability. Platt and Spivack (1975) reviewed a number of studies which support the contention that psychological adjustment is related to the capacity to solve real-life problem situations. Results of these studies indicate that adaptive problem-solving cognition discriminates between groups differing on dimensions of personal and social adjustment (Platt and Spivak, 1975). Problem-solving ability not only successfully discriminates between groups that greatly differ in level of maladjustment, but also among individuals in a relatively
homogeneous population who differ in degree of social competence (Platt & Spivak, 1972a; Ziegler & Phillips, 1962). Intagliata (1978), using the Means-Ends Problem-Solving Procedure (MEPS) (Platt & Spivak, 1975) demonstrated that problem-solving ability was significantly related to alcoholic subjects' social competence and to their performance in an interview assessing their ability to deal with post-discharge problems. Gotlib and Asarnow (1979) found problem-solving ability and depression to be significantly and negatively correlated in a college student population. Platt and Spivak (1972b) studied problem-solving ability in short-term psychiatric patients as compared to hospital employee controls. Results showed that those individuals requiring hospitalization were less able to provide effective responses to hypothetical real-life problematic situations. The results of this study are consistent with others that investigated problem-solving ability in maladjusted children of various ages (Shure & Spivak, 1972; Spivak & Levine, 1963; Spivak & Shure, 1973). These investigators concluded that the ability to cope effectively with life's problematic demands exerts a significant effect upon healthy psychological functioning. Problem-solving ability, then, would appear to be a likely candidate for study as a possible moderator of life stress.

Hypotheses

The goal of this study was to examine the relationship between problem-solving ability and the psychological effects of life stress.
It was hypothesized that problem-solving ability would moderate the effects of life change. Specifically, it was predicted that individuals possessing a high degree of problem-solving ability would be affected less adversely by high levels of negative life change than persons with a low degree of problem-solving ability. Interactions in the positive life change categories were not expected to be significant, as this author concurs with the conceptualization that life stress is a result of negative life change as opposed to positive life change.
CHAPTER II

METHOD

Subjects

Eighty male and female students in introductory psychology courses were recruited to participate in a psychology study for which they received experimental credit. Subjects were grouped according to their median split scores on the Life Experiences Survey (LES) and the Mean-Ends Problem-Solving Procedure (MEPS).

Procedure

All subjects completed the LES, a shortened version of the MEPS procedure, Beck Depression Inventory, State-Trait Anxiety Inventory, and a brief questionnaire consisting of demographic data. The various test instruments were arranged in random order for each subject participating in the group administration.

Instruments

Means-Ends Problem-Solving Procedure. This instrument consists of five problem-solving stories extracted from the Means-Ends Problem-Solving (MEPS) Procedure Manual (Platt & Spivak, 1975) (see Appendix A). The stories consist of hypothetical problem situations that the subject is to resolve. Each story provides the subject with the
problematic beginning and with the end of the story in which the problem has been solved. The subject is instructed to complete the story, telling how the protagonist overcomes the problem and reaches the goal at the end. Two student raters were trained on non-experimental protocols to discriminate relevant from irrelevant means of solving the problems according to the criteria of Platt and Spivak (1975). A relevant mean is described as the following:

... each discrete step which is effective in enabling the hero of the story to reach the resolution stage of the story or to overcome an obstacle preventing the hero from reaching the goal in the story. (Platt & Spivak, 1975, p. 21).

A relevancy score was computed from the raw score as follows:

relevancy score = total relevant means/total relevant means + all other responses.

The MEPS procedure is designed to assess an individual's ability to orient himself to, and conceptualize means of moving toward a goal. This measure was first developed by Spivak and Levine (1963) in order to study the relationship between interpersonal problem-solving skills and adjustment. The authors emphasize that the MEPS procedure measures interpersonal problem-solving skills, and as such, is unique from other measures such as anagram tests, intelligence measures, etc. Support for this contention can be found in a study investigating depression and problem-solving ability (Gotlib & Asarnow, 1979). These investigators found that performance on the MEPS procedure and
an anagram test were not significantly correlated. Further, whereas the MEPS and depression were significantly related, the anagram measure did not significantly correlate with depression. Gotlib and Asarnow also compared MEPS procedure scores and IQ using a multiple choice form of the WAIS vocabulary subscale. Correlations were not significant, which is consistent with the contention that IQ is not highly related to interpersonal problem-solving ability as measured by the MEPS procedure. Evidence for concurrent and content validity of the MEPS procedure was cited earlier in reference to the study by Intagliata (1978) that showed MEPS scores to be highly correlated with poor social competence in an alcoholic population.

Platt and Spivak (1975) report interrater reliability for two raters as .98, however, this reflects the procedure of resolving disagreements in scoring by conferring with the experimenter. The MEPS measure has been found to differentiate between adult psychiatric inpatients and normal controls (Platt & Spivak, 1970, 1972b) and between maladjusted and normal children in various age groups (Shure and Spivak, 1971, 1972; Spivak & Shure, 1963).

Life Experiences Survey. The LES (see Appendix B) has been extensively discussed in the literature review. This measure was originally designed to provide a means of measuring the impact that stressful life change has upon the individual. The LES is a self-report instrument containing 57 items that the subject is instructed to endorse if s/he has experienced the events within the past twelve months. Scores for the events range from extremely positive impact
(+3) to extremely negative impact (-3). Those events rated as positive are summed to yield a positive change score, and those rated as negative are summed to provide a negative change score. Positive and negative change scores have been found to be essentially uncorrelated with one another (Sarason & Johnson, 1978; Smith, Sarason, & Johnson, 1978), and so each subject will provide two scores on the LES, negative and positive, which will be analyzed separately in the data analysis. Test-retest reliability over five to six week intervals was reported as .19 and .63 for positive change and .56 and .56 for negative change. Higher negative change scores have been found to be positively related to depression, external locus of control, more severe personal maladjustment, and being an outpatient in psychotherapy.

**Beck Depression Inventory.** The BDI consists of 21 clinically derived items which include affective, physiological and motivational areas of depressive symptomatology (Beck, 1967). Beck and his colleagues report that the items were chosen as indications of overt behavioral manifestations of depressive illness rather than reflecting any theory of the etiology underlying psychological process in depression, and whether or not depression is the primary diagnosis. Each item on the revised edition (Beck, 1972) can be scored from zero to three, the maximum possible score being 63. The scores are interpreted in the following categories: 0-9 (not depressed); 10-15 (mildly depressed); 16-23 (moderately depressed); 24-63 (severely depressed).
The BDI has been utilized as a criterion measure in over one hundred published studies (Beck & Beck, 1972). Beck, Ward, Mendelson, Mock and Erbaugh (1961) reported two validation studies which were conducted in psychiatric populations. The BDI was administered to a sample of 226 hospitalized and clinic psychiatric patients, and then the procedure was replicated using 183 patients. Experienced psychiatrists' ratings were the validating measures, and comparisons of these ratings and BDI scores indicated a high degree of validity (.65 and .67 with n = 226 and n = 183 respectively). The inventory of efficiently discriminated among groups of patients with varying degrees of depression with the passage of time. Beck et al. (1961) also reported that internal consistency and stability of the instrument was high. Nussbaum, Wittig, Hanlon and Kurland (1963) reported a correlation of .67 between changes in clinicians' ratings and changes in BDI scores. In a study concerning the validation of the BDI in a university population using psychiatric estimations as the criterion, the researchers found that the BDI is, in fact, a valid instrument for assessment of depression in this population (Bumberry, Oliver, & McClure, 1978). The evidence for construct validity and discriminant validity as reviewed by Beck and Beck (1972) appears to be good.

State-Trait Anxiety Inventory. The STAI (Spielberger, Gorsuch, and Lushene, 1970) is a self-report inventory designed to separately assess state anxiety and trait anxiety (see Appendix D). The STAI A-Trait scale is composed of twenty statements and asks the subject
to rate how s/he generally feels, whereas the STAI A-State scale asks subjects how they feel at the particular moment of testing.

Factor analytic studies of the STAI (Kendall et al., 1976) have provided support for the state-trait anxiety distinction, as state anxiety varies across stress and non-stress conditions, whereas trait anxiety remains relatively stable. A number of studies have indicated the reliability of the STAI to be adequate. Test-retest correlations for the A-State scale range from .16 to .54, and those for the A-Trait range from .73 to .86. The relatively lower correlations for the A-State scale are a result of being designed to measure the impact of a particular testing situation. Concurrent validity has been reported in the form of comparing the STAI A-Trait scores of college students and neuropsychiatric patients with scores on the Taylor Manifest Anxiety Scale (Taylor, 1953), the Affect Adjective Checklist (Zuckerman, 1960), and IPAT Anxiety Scale (Cattell and Scheir, 1963). Correlations among the STAI, IPAT, and TMAS were moderately high, however, the AACL was only moderately correlated with the other instruments.
CHAPTER III

RESULTS

Data were analyzed by means of a separate 2X2X2X2 (high/low problem-solving ability x positive/negative life change x high/low life change x male/female) factorial analysis of variance design for each of the three dependent measures (Edwards, 1972). Significant interactions were further analyzed by means of the Least Significant Difference (LSD) multiple comparison procedure (Snedecor & Cochran, 1967). A Spearman-Brown interrater reliability coefficient of .92 was obtained between the two raters scoring the Means-Ends Problem-Solving Procedure experimental protocols. Consistent with the trend noted in the recent literature, the terms life stress and life change are used synonymously.

Beck Depression Inventory

Table 1 presents the mean squares, F ratios and probabilities of the main effects and interactions for the Beck Depression Inventory (BDI). As can be seen from this table, no significant main effects were obtained. However, a significant positive/negative life change x high/low life change interaction was observed and is illustrated in Figure 1. The differences between the means of high negative life change groups and the low negative life change groups was significant ($t(144)=3.269, p<.01$). The means for this interaction are represented
## Table 1

Summary Table for Analysis of Variance of the Beck Depression Inventory

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td>15</td>
<td>796.175</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Problem-Solving</td>
<td>1</td>
<td>55.225</td>
<td>55.225</td>
<td>1.578</td>
<td>0.208</td>
</tr>
<tr>
<td>High/Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: Life Stress</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Positive/Negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C: Life Stress</td>
<td>1</td>
<td>105.625</td>
<td>105.625</td>
<td>3.018</td>
<td>0.081</td>
</tr>
<tr>
<td>High/Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: Sex</td>
<td>1</td>
<td>126.025</td>
<td>126.025</td>
<td>3.601</td>
<td>0.056</td>
</tr>
<tr>
<td>Male/Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxB</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>AxC</td>
<td>1</td>
<td>7.23</td>
<td>7.23</td>
<td>0.296</td>
<td>0.655</td>
</tr>
<tr>
<td>BxC</td>
<td>1</td>
<td>291.600</td>
<td>291.600</td>
<td>8.332</td>
<td>0.0047**</td>
</tr>
<tr>
<td>AxD</td>
<td>1</td>
<td>30.625</td>
<td>30.625</td>
<td>0.875</td>
<td>0.646</td>
</tr>
<tr>
<td>BxD</td>
<td>1</td>
<td>0.0000005</td>
<td>0.0000005</td>
<td>-0.000</td>
<td>0.996</td>
</tr>
<tr>
<td>CxD</td>
<td>1</td>
<td>5.625</td>
<td>5.625</td>
<td>0.161</td>
<td>0.692</td>
</tr>
<tr>
<td>AxBxC</td>
<td>1</td>
<td>115.600</td>
<td>115.600</td>
<td>3.303</td>
<td>0.677</td>
</tr>
<tr>
<td>AxBxD</td>
<td>1</td>
<td>0.0000001</td>
<td>0.0000001</td>
<td>-0.000</td>
<td>0.996</td>
</tr>
<tr>
<td>AxCxD</td>
<td>1</td>
<td>24.025</td>
<td>24.025</td>
<td>0.686</td>
<td>0.586</td>
</tr>
<tr>
<td>BxCxD</td>
<td>1</td>
<td>22.500</td>
<td>22.500</td>
<td>0.643</td>
<td>0.570</td>
</tr>
<tr>
<td>AxBxCxD</td>
<td>1</td>
<td>12.100</td>
<td>12.100</td>
<td>0.346</td>
<td>0.565</td>
</tr>
<tr>
<td>Within Treatments:</td>
<td>144</td>
<td>5039.80</td>
<td>34.9986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>5835.95</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 1

Interaction of Positive/Negative Life Change X High/Low

Life Change for the Beck Depression Inventory
in Table 2. The low negative life change BDI mean was significantly lower than the low positive life change mean \( t(144)=2.038, p < .05 \), and the high negative change BDI mean was significantly higher than the high positive change mean \( t(144)=2.038, p < .05 \). This last finding provides the predicted support for the contention that psychological distress arises primarily from an accumulation of negative as opposed to positive life events.

Although the four factor interaction (high/low problem solving ability X positive/negative life change X high/low life change X male/female) did not attain significance, an interesting trend was noted with respect to the BDI dependent measure. Specifically, the prediction that the greatest mean BDI score would be obtained for that subject group evidencing low problem solving skills and a high level of negative life change was verified (see Table 3). More importantly, the high/low problem solving X positive/negative change X high/low change interaction approached significance \( F(1,144)=3.3, p < .0677 \). The LSD procedure revealed that the group exhibiting low problem solving ability was significantly more depressed \( p < .05 \) when confronted with a high level of negative life change than the group reporting the same negative stress but a high degree of problem solving ability. Those poor problem-solvers reporting high degrees of negative life stress were also more depressed than poor problem solvers reporting high degrees of positive life stress, indicating the positive/negative dimension to be important. As can be seen from Table 1, sex difference for the BDI analysis of variance did not attain significance.
Table 2

Means for Positive/Negative Change X High/Low Life Change

Interaction Beck Depression Inventory

<table>
<thead>
<tr>
<th></th>
<th>High Change</th>
<th>Low Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7.350</td>
<td>8.425</td>
</tr>
<tr>
<td>SD</td>
<td>1.792</td>
<td>1.510</td>
</tr>
<tr>
<td>Negative Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>10.050</td>
<td>5.725</td>
</tr>
<tr>
<td>SD</td>
<td>2.428</td>
<td>1.382</td>
</tr>
</tbody>
</table>
Table 3

Means and Standard Deviations for Scores on the Beck Depression Inventory

<table>
<thead>
<tr>
<th></th>
<th>High Problem-Solving Ability</th>
<th>Low Problem-Solving Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive Life Change</td>
<td>Negative Life Change</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>M  F</td>
<td>M  F</td>
</tr>
<tr>
<td></td>
<td>6.5 8.3</td>
<td>5.48 5.69</td>
</tr>
<tr>
<td></td>
<td>7.2 7.2</td>
<td>5.55 4.10</td>
</tr>
<tr>
<td></td>
<td>8.8 8.0</td>
<td>4.91 6.22</td>
</tr>
<tr>
<td></td>
<td>4.9 7.5</td>
<td>3.84 7.42</td>
</tr>
<tr>
<td></td>
<td>5.3 9.3</td>
<td>3.83 7.30</td>
</tr>
<tr>
<td></td>
<td>9.0 10.3</td>
<td>4.98 9.72</td>
</tr>
<tr>
<td></td>
<td>9.9 13.5</td>
<td>3.13 4.38</td>
</tr>
</tbody>
</table>

Note. M=Male; F=Female
State Trait Anxiety Inventory State

Table 4 presents the mean squares, F ratios and probabilities for the main effects and interactions for the State-Trait Anxiety Inventory-State (STAI-State). As can be seen from this table, no significant main effects were obtained. Figure 2 illustrates the significant positive-negative X high/low life change interaction.

The difference between the high negative life change groups and the low negative life change groups was significant (t(144)=1.091, p < .05). The means for this interaction are presented in Table 5. The sixteen treatment means and standard deviations for the STAI-State are displayed in Table 6.

State-Trait Anxiety Inventory-Trait

Table 7 presents the analysis of variance summary table for the State-Trait Anxiety Inventory-Trait (STAI-Trait). As can be seen from this table, two significant main effects were obtained for the STAI-Trait, one for problem-solving ability, and one for sex. Analysis of the data revealed that the high problem solving ability group reported significantly (p < .05) more trait anxiety (M=42.53) than the low problem-solving ability group (M=38.88). In addition, females reported a significantly higher (p < .05) level of trait anxiety (M=42.48) than males (M=38.93). No significant interactions were obtained for the STAI-Trait measure, although the high/low stress X positive/negative change interaction approached significance, as can be seen from Table 5. The sixteen treatment means and standard deviations for the STAI-Trait are displayed in Table 8.
## TABLE 4

**SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF THE STAI-STATE**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Problem-Solving</td>
<td>15</td>
<td>1292.569</td>
<td>86.169</td>
<td>126.025</td>
<td>0.0236</td>
</tr>
<tr>
<td>High/Low</td>
<td>1</td>
<td>126.025</td>
<td>126.025</td>
<td>1.405</td>
<td>0.236</td>
</tr>
<tr>
<td>B: Life Stress</td>
<td>1</td>
<td>3.600</td>
<td>3.600</td>
<td>0.040</td>
<td>0.836</td>
</tr>
<tr>
<td>Positive/Negative</td>
<td>1</td>
<td>24.025</td>
<td>24.025</td>
<td>0.268</td>
<td>0.612</td>
</tr>
<tr>
<td>C: Life Stress</td>
<td>1</td>
<td>21.025</td>
<td>21.025</td>
<td>0.234</td>
<td>0.635</td>
</tr>
<tr>
<td>High/Low</td>
<td>1</td>
<td>1.099</td>
<td>1.099</td>
<td>0.001</td>
<td>0.972</td>
</tr>
<tr>
<td>D: Sex</td>
<td>1</td>
<td>3.600</td>
<td>3.600</td>
<td>0.040</td>
<td>0.836</td>
</tr>
<tr>
<td>Male/Female</td>
<td>1</td>
<td>24.025</td>
<td>24.025</td>
<td>0.268</td>
<td>0.612</td>
</tr>
<tr>
<td>AxB</td>
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</table>
Figure 2

Interaction of Positive/Negative Change X High/Low Change

For The State-Trait Anxiety Inventory-State
Table 5

Means for Positive/Negative Change X High/Low Change Interaction

State-Trait Anxiety Inventory-State

<table>
<thead>
<tr>
<th></th>
<th>High Change</th>
<th>Low Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Change</strong></td>
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<td></td>
</tr>
<tr>
<td>M</td>
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<td>SD</td>
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Table 6

Means and Standard Deviations for Scores on the STAI-State

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</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Negative Life Change</td>
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<tr>
<td></td>
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<td>Low</td>
</tr>
<tr>
<td></td>
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<td>M</td>
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<tr>
<td>F</td>
<td>41.7</td>
<td>41.2</td>
</tr>
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<td></td>
<td>46.0</td>
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<td></td>
<td>37.3</td>
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</tr>
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<td></td>
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<td>SD</td>
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Note. M=Male; F=Female
### TABLE 7

SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF THE STAI-TRAIT

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: Problem-Solving</td>
<td>15</td>
<td>116.109</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High/Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: Life Stress</td>
<td>1</td>
<td>0.025</td>
<td>0.025</td>
<td>0.000</td>
<td>0.984</td>
</tr>
<tr>
<td>Positive/Negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C: Life Stress</td>
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<td>180.625</td>
<td>180.625</td>
<td>1.949</td>
<td>0.161</td>
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<td>High/Low</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: Sex</td>
<td>1</td>
<td>504.100</td>
<td>504.100</td>
<td>5.440</td>
<td>0.019*</td>
</tr>
<tr>
<td>Male/Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AxB</td>
<td>1</td>
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<td>0.025</td>
<td>0.000</td>
<td>0.984</td>
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<tr>
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<td>14.400</td>
<td>0.155</td>
<td>0.696</td>
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<tr>
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<td>0.025</td>
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<td>0.984</td>
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<td>0.696</td>
</tr>
<tr>
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<td>Error</td>
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</table>
Table 8

Means and Standard Deviations for Scores on the STAI-Trait

<table>
<thead>
<tr>
<th></th>
<th>High Problem-Solving Ability</th>
<th>Low Problem-Solving Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive Life Change</td>
<td>Negative Life Change</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>M 39.5</td>
<td>F 44.1</td>
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<tr>
<td></td>
<td>SD 10.43</td>
<td>SD 11.37</td>
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<td></td>
<td>M 44.4</td>
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<td></td>
<td>SD 8.60</td>
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<tr>
<td></td>
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<td></td>
<td>SD 10.79</td>
<td>SD 7.52</td>
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Note. M=Male; F=Female
CHAPTER IV

DISCUSSION

Summary of Findings

Mental health professionals and researchers in the area of life stress have often observed that environmental stressors do not affect people uniformly. Rather, some individuals can withstand a great degree of life change with little noticeable effect, whereas others become severely distressed as a result of relatively minor life change. Some important individual differences that exert moderating effects upon the perception and impact of life stress include sensation seeking tendency (Smith, Johnson & Sarason, 1978), locus of control (Johnson & Sarason, 1978), and psychosocial assets (Nuckolls, Cassell, & Kaplan, 1972). The goal of this study was to investigate the relationship between problem-solving ability, a possible moderator variable, and the psychological effects of life stress. It was predicted that individuals possessing a high degree of problem-solving ability would be less depressed and anxious when confronted by high levels of negative life change than would persons with a low degree of problem-solving ability.

In the present investigation, problem-solving ability (as measured by the MEPS Procedure) was not found to moderate the effects

50
of life stress at a statistically significant level. The predicted high/low problem-solving ability X positive/negative life change X high/low life change interaction closely approached statistical significance ($p < .067$) with respect to the Beck Depression Inventory. This finding has heuristic value in suggesting that problem-solving ability does mediate depressive reactions that may be associated with life change. Specifically, individuals possessing a low degree of problem-solving ability were more depressed when confronted with a high amount of negative life stress than individuals with high problem-solving skills undergoing the same stress.

Consistent with findings reported by other researchers (Johnson & Sarason, 1970), the current study found that high life change interacted with negative life change to produce the greatest level of depression and state anxiety in subjects. This finding provides further support for the relatively recent conceptualization (Sarason & Johnson, 1976) that psychological distress arises primarily from an accumulation of stressful negative life events as opposed to the traditional view held by Rahe and his colleagues (Holmes & Rahe, 1976; Rahe, McKean, & Arthur, 1967) that total life change, both positive and negative, is responsible for the deleterious effects of life stress.

No significant interactions were found with respect to trait anxiety, although the same high/low X positive/negative life change interaction that was observed with respect to the Beck Depression
Inventory and the STAI-State dependent measures approached significance (p < 0.080). Considering that trait anxiety is, by definition, an enduring and stable characteristic of an individual, it is less likely to fluctuate in response to transient stress than would state anxiety and depression, which are more situationally determined. The instructions for the Life Experiences Survey specifically request that subjects only endorse those events that have occurred within the past twelve months; therefore, long term anxiety is less affected with respect to this variable than more current state anxiety.

From the results it is apparent that individuals possessing a high degree of problem-solving ability report significantly more trait anxiety than those with a lesser degree of problem-solving ability. One possible explanation for this seemingly discrepant finding is the nature of the MEPS Procedure. The MEPS Procedure is designed to test an individual's ability to recognize and formulate a problem in addition to discriminating relevant from irrelevant information and generating an appropriate response (Platt & Spivack, 1975). The finding that high problem-solvers evidence more trait anxiety does not necessarily imply that this anxiety is maladaptive. Instead, at moderate levels, arousal can be a powerful energizing and motivating force (Yerkes & Dodson, 1908). Very speculatively, it may be that individuals who achieve high scores on the MEPS Procedure are not only more effective problem-solvers, but are more aware of potential problems posed by their environment. These individuals may
be more aware of subtle life pressures and problems and, therefore, are more disturbed by life change than individuals who possess poor problem-solving skills and who may be oblivious to such potential difficulties. It would seem reasonable, then, that the slightly more vigilant individuals would experience a higher level of trait anxiety due to their heightened awareness of the complexity of their environment. No other studies investigating the relationship between the MEPS Procedure and anxiety were reported in the literature, suggesting a need for future research to replicate and investigate this interesting finding.

Treatment Implications

If future researchers are successful in identifying a correlational or causative relationship between social coping or problem-solving ability and life stress, the implications for prevention and treatment would be far-reaching. Although not statistically significant, the results of the present investigation suggest that such a relationship exists. Several effective therapies are currently available that emphasize helping the client to develop a repertoire of problem-solving and coping skills that will enable him to adapt to a variety of stressful situations. These therapy programs include covert modeling (Cautela, 1971), Goldfried's (1971) modified desensitization procedures, anxiety management training (Suinn & Richardson, 1971), Meichenbaum's (1975) stress inoculation program, and the "personal science" problem-solving approach (Mahoney, 1977).
The clinical potential of these various remediation programs merits some discussion. Problem-solving therapies require active participation by the client in his own treatment process. Thus, the individual is taught to accurately assess and define his problem, generate and examine his options, attempt new coping behaviors, etc. The primary strength of this treatment approach lies in its generalizability. The client is taught problem-solving strategies that can be applied outside the therapy room, enabling him to cope independently with his environment. Since the client is instructed to evaluate changes in his behavior and adjust coping efforts commensurate with his own rate of progress, these therapies are likely to exhibit good maintenance over time.

These various coping skills therapies might serve both preventative and treatment purposes, especially with respect to populations which will be subjected to highly stressful situations or changes in environment. For example, one such high risk population might be pregnant women expecting their first child. Previously mentioned research by Nuckolls et al. (1972), found that women who evidenced high levels of psychosocial assets and life stress experienced a lower rate of birth complications than women with equally high levels of life stress but fewer environmental support systems. If a relationship between specific interpersonal problem-solving skills and life stress was identified, a treatment program directed at assessing and remediating such skills in women reporting low psychosocial assets could be implemented in women experiencing a great
degree of negative life stress during pregnancy. Another particularly stressed population is that of individuals who have suddenly become physically disabled by surgery or illness. Problem-solving therapies could be integrated into existing vocational and social rehabilitation programs directed towards aiding the individual to readjust to his or her disability. More hypothetically, it would seem advisable to implement problem-solving training into the educational curriculum to enable children and adolescents to more effectively cope with inevitable current and future stressors in their rapidly changing environment. Additional highly stressed groups that might benefit from problem-solving training include military recruits, divorcees, transferred employees, and individuals contracting such chronic diseases as multiple sclerosis, diabetes, and hypertension. Although preliminary and tentative in nature, the findings of this study are promising with respect to future treatment implications and point to a potentially important direction for further research in the area of stress-moderating variables.

Implications for Future Research

Although not statistically significant, the observed interaction between problem-solving ability and negative life change indicates that interpersonal problem-solving ability, or more generally, coping skills, is a fruitful area for future investigation. Numerous researchers in the area of life stress have hypothesized that effective coping skills moderate the potentially detrimental psychological
effects of life change (Dohrenwend & Dohrenwend, 1974; Gotlib & Asarnow, 1979; Intagliata, 1978; Johnson & Sarason, 1979; Rabkin & Struening, 1976). Currently the present investigation is the first study specifically designed to address this hypotheses. It is likely that more sophisticated measures of problem-solving ability than the MEPS Procedure will produce more significant results. Unfortunately, although substantial literature exists concerning remediation of social incompetence and deficient coping skills, few methods are available which are designed to measure these variables (Goldfried & Linehan, 1977). In fact, Curran (1977) reviewed the existing social skills training literature and concluded that a major deficit in this area concerns the assessment of social skills. Despite this fact, there does exist one recent attempt to address this deficiency which does appear promising.

Utilizing Goldfried and D'Zurilla's (1969) recommendation to empirically construct a domain of problematic social situations, Levenson and Gottman (1978) devised an eighteen-item questionnaire assessing the probability of occurrence of certain behaviors and the accompanying degree of distress and expected social incompetence of individuals when confronted with such difficult social situations. They found that their questionnaire discriminated between a normal student population and a client population that was self-referred for social-skills training. Although this questionnaire is specifically designed to assess social competence in dating and assertion situations,
it would seem to be a possible measure to utilize in investigating social competence and its relationship to life stress and psychological distress. It is hoped that with the growing interest in this area there will be a greater number of assessment alternatives in the near future.

One particularly promising area for future research is suggested by the identified role of life stress in the etiology of such physical symptomatology as myocardial infarction (Rahe & Paasikivi, 1971; Theorell & Rahe, 1971), tuberculosis (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964), asthma (deAranjo, Van Arsdel, Holmes & Dudley, 1973), pregnancy complications (Gorsuch & Key, 1974; Nuckolls, Cassell, and Kaplan, 1972), and diabetes (Rahe, 1976; Rahe, McKean, & Arthur, 1967). Treatment outcome studies could be designed to study the effects of problem-solving training upon the need for medical intervention. Physical symptomatology (frequency of asthmatic episodes, number of pregnancy complications) or level of medication (insulin) would serve as objective dependent measures. In addition, patients awaiting major surgery might be instructed in coping skills and their post-treatment requests for analgesic medication in addition to the degree of psychological and physical adjustment could be assessed. The possibilities for similar studies undertaken with highly stressed populations are limitless, and again provide a promising direction for future investigations in the area of life stress.
CHAPTER V

SUMMARY

Research investigating the physical and psychological effects of life stress has received increasing attention in the years following Selye's (1956) pioneering work in this area. Since that time, numerous studies have documented a strong correlational relationship between both physical and mental illness and self-reported life changes. Most of the research concerning stress-related illness and life change has been based upon a conceptual framework that links stress with total amount of life change, whether desirable or undesirable in nature. Recently, investigators have begun to question this conceptualization of life stress which combines positive and negative events.

The Life Experiences Survey was developed as a measure of life stress with the above issue in mind (Sarason, Johnson & Siegel, 1978). The unique format of the Life Experiences Survey allows the respondent to rate separately the impact and desirability of events that they have experienced in the past twelve months. Thus, separate scores for positive and negative change are obtained, providing a means for investigating the question of whether the detrimental effects of life change are due to positive or negative life change. Results
of the present investigation provided support for the conceptualization of psychological distress as being a result of negative, as opposed to positive, life change.

It is probable that individual differences have moderating effects upon the perception and impact of life stress. Low levels of life change appear to greatly affect some individuals whereas high levels affect others relatively mildly. Research investigating the role of moderator variables is scarce, although several such variables have been recently identified, including psychosocial assets (Nuckolls, Cassel, & Kaplan, 1972), locus of control (Johnson & Sarason, 1978), and sensation seeking tendency, (Smith, Johnson & Sarason, 1978). The purpose of this study was to investigate the role of problem-solving ability as a possible moderator variable in the process of coping with life stress.

Eighty college undergraduates completed the Means-Ends Problem-Solving Procedure and were identified as possessing either poor or effective problem-solving skills on the basis of their scores on this measure. The Life Experiences Survey was utilized as a measure of self-reported positive and negative life change occurring within the past twelve months. In addition, all subjects completed the Beck Depression Inventory and the State-Trait Anxiety Inventory. It was expected that those subjects possessing poor problem-solving ability who reported high levels of negative life change would be more depressed and anxious than subjects demonstrating proficient problem-solving skills.
The results of this investigation failed to find problem-solving ability, as measured by the Means-Ends Problem-Solving Procedure, to be an important overall moderator of life stress. The predicted interaction among high/low problem-solving ability X positive/negative life change X high/low life change did closely approach significance with respect to the Beck Depression Inventory, however, suggesting that problem-solving ability, or more generally, interpersonal coping ability, does exert a moderating influence upon the depressive effects of life change. Implications for prevention and treatment of the detrimental effects of life stress were discussed, in addition to directions for future research.
REFERENCE NOTES


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APPENDIX A

MEPS PROCEDURE

Subject #___

In this procedure we are interested in your imagination and creative ability. You are to make up some stories. For each story you will be given the beginning of the story and how it ends. Your job is to make up a story that connects the beginning that is given to you with the ending given you. In other words, please make up the middle of the story.

Take as long as you need to make up the middle of the story. We would like you to write as much as you can on each one, but write at least one paragraph on each story. Thank you.

1. Harry loved his girlfriend very much, but they had many arguments. One day she left him. Harry wanted things to be better. The story ends with everything fine between him and his girlfriend. You begin the story with his girlfriend leaving him after an argument.

2. Mr. P. came home after shopping and found that he had lost his watch. He was very upset about it. The story ends with Mr. P. finding his watch and feeling good about it. You begin the story where Mr. P. found that he had lost his watch.

3. During the Nazi occupation a man's wife and children were viciously tortured and killed by an SS trooper, and the man swore revenge. The story begins one day after the war, when the man enters a restaurant and sees the ex-SS trooper. The story ends with the man killing the SS trooper. You begin when he sees the SS trooper in the restaurant.

4. Joe is having trouble getting along with the foreman on his job. Joe is very unhappy about this. The story ends with Joe's foreman liking him. You begin the story where Joe isn't getting along with his foreman.

5. Bob needed money badly. The story begins one day when he notices a valuable diamond in a shop window. Bob decides to steal it. The story ends when he succeeds in stealing the diamond. You begin when he sees the diamond.
APPENDIX B

The Life Experiences Survey

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. Please check those events which you have experienced in the recent past and indicate the time period during which you have experienced each event. Be sure that all check marks are directly across from the items they correspond to.

Also, for each item checked below, please indicate the extent to which you viewed the event as having either a positive or negative impact on your life at the time the event occurred. That is, indicate the type and extent of impact that the event had. A rating of −3 would indicate an extremely negative impact. A rating of 0 suggests no impact either positive or negative. A rating of +3 would indicate an extremely positive impact.

Section 1

<table>
<thead>
<tr>
<th>Event</th>
<th>0</th>
<th>7 mo</th>
<th>1 yr</th>
<th>6 mo</th>
<th>1 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Marriage</td>
<td>1</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>2. Detention in jail or comparable institution</td>
<td>1</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
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</tr>
<tr>
<td>3. Death of spouse</td>
<td>1</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>4. Major change in sleeping habits</td>
<td>1</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
</tbody>
</table>

(much more or much less sleep)
<table>
<thead>
<tr>
<th>Event Description</th>
<th>0-7 mo</th>
<th>6 mo-1 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Death of close family member:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. mother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>b. father</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>c. brother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>d. sister</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>e. grandmother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>f. grandfather</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>g. other (specify)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>6. Major change in eating habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(much more or much less food intake)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>7. Forfeiture on mortgage or loan</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>8. Death of close friend</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>9. Outstanding personal achievement</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>10. Minor law violations (traffic tickets, disturbing the peace, etc.)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>11. Male: Wife's girlfriend's pregnancy</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>12. Female: Pregnancy</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>13. Changed work situation (different work responsibility, major change in working conditions, working hours, etc.)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>14. New job</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>15. Serious illness or injury of close family member:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. father</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>b. mother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>c. sister</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>d. brother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>e. grandfather</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>f. grandmother</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>g. spouse</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>h. other (specify)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>16. Sexual difficulties</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>17. Trouble with employer (in danger of losing job, being suspended, demoted, etc.)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>18. Trouble with in-laws</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>19. Major change in financial status (a lot better off or a lot worse off)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>20. Major change in closeness of family members (increased or decreased closeness)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>21. Gaining a new family member (through birth, adoption, family member moving in, etc.)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>22. Change of residence</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>23. Marital separation from mate (due to conflict)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>24. Major change in church activities (increased or decreased attendance)</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>Event</td>
<td>0 mo</td>
<td>7 mo to 1 yr</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Marital reconciliation with mate</td>
<td>-3</td>
<td>2</td>
</tr>
<tr>
<td>Major change in number of arguments with spouse</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Married female: Change in wife's work outside the home (beginning work, ceasing work, changing to a new job, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Married female: Change in husband's work (loss of job, beginning new job, retirement, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Major change in usual type and/or amount of recreation</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Borrowing more than $10,000 (buying home, business, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Borrowing less than $10,000 (buying car, TV, getting school loan, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Being fired from job</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Male: Wife's girlfriend having abortion</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Female: Having abortion</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Major personal illness or injury</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Divorce</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Serious injury or illness of close friend</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Retirement from work</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Son or daughter leaving home (due to marriage, college, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Ending of formal schooling</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Separation from spouse (due to work, travel, etc.)</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Engagement</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Breaking up with boyfriend/girlfriend</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Leaving home for the first time</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Reconciliation with boyfriend/girlfriend</td>
<td>-3</td>
<td>-2</td>
</tr>
</tbody>
</table>

**Impact on your life: List and rate**

1. Marital reconciliation with mate: -3 -2 -1 0 +1 +2 +3
2. Major change in number of arguments with spouse: -3 -2 -1 0 +1 +2 +3
3. Married female: Change in wife's work outside the home: -3 -2 -1 0 +1 +2 +3
4. Married female: Change in husband's work: -3 -2 -1 0 +1 +2 +3
5. Major change in usual type and/or amount of recreation: -3 -2 -1 0 +1 +2 +3
6. Borrowing more than $10,000: -3 -2 -1 0 +1 +2 +3
7. Borrowing less than $10,000: -3 -2 -1 0 +1 +2 +3
8. Being fired from job: -3 -2 -1 0 +1 +2 +3
9. Male: Wife's girlfriend having abortion: -3 -2 -1 0 +1 +2 +3
10. Female: Having abortion: -3 -2 -1 0 +1 +2 +3
11. Major personal illness or injury: -3 -2 -1 0 +1 +2 +3
12. Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation): -3 -2 -1 0 +1 +2 +3
13. Major change in living conditions of family: -3 -2 -1 0 +1 +2 +3
14. Divorce: -3 -2 -1 0 +1 +2 +3
15. Serious injury or illness of close friend: -3 -2 -1 0 +1 +2 +3
16. Retirement from work: -3 -2 -1 0 +1 +2 +3
17. Son or daughter leaving home (due to marriage, college, etc.): -3 -2 -1 0 +1 +2 +3
18. Ending of formal schooling: -3 -2 -1 0 +1 +2 +3
19. Separation from spouse (due to work, travel, etc.): -3 -2 -1 0 +1 +2 +3
20. Engagement: -3 -2 -1 0 +1 +2 +3
21. Breaking up with boyfriend/girlfriend: -3 -2 -1 0 +1 +2 +3
22. Leaving home for the first time: -3 -2 -1 0 +1 +2 +3
23. Reconciliation with boyfriend/girlfriend: -3 -2 -1 0 +1 +2 +3
Section 2: Student Only

51. Beginning a new school experience at a higher academic level (college, graduate school, professional school, etc.)

52. Changing to a new school at same academic level (undergraduate, graduate, etc.)

53. Academic probation

54. Being dismissed from dormitory or other residence

55. Failing an important exam

56. Changing a major

57. Failing a course

58. Dropping a course

59. Joining a fraternity/sorority

60. Financial problems concerning school (in danger of not having sufficient money to continue)
APPENDIX C

INSTRUCTIONS TO THE BECK INVENTORY

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. ( ) 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2. ( ) 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel I am a complete failure as a person.

3. ( ) 0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 As I look back on my life, all I can see is a lot of failures.
   3 I feel I am a complete failure as a person.

4. ( ) 0 I get as much satisfaction out of things as I used to.
   1 I don't enjoy things the way I used to.
   2 I don't get real satisfaction out of anything anymore.
   3 I am dissatisfied or bored with everything.

5. ( ) 0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. ( ) 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. ( ) 0 I don't feel disappointed in myself.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.
8.  ( ) 0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.

9.  ( ) 0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. ( ) 0 I don't cry anymore than usual.
    1 I cry more now than I used to.
    2 I cry all the time now.
    3 I used to be able to cry, but now I can't cry even though I want to.

11. ( ) 0 I am no more irritated now than I ever am.
    1 I get annoyed or irritated more easily than I used to.
    2 I feel irritated all the time now.
    3 I don't get irritated at all by the things that used to irritate me.

12. ( ) 0 I have not lost interest in other people.
    1 I am less interested in other people than I used to be.
    2 I have lost most of my interest in other people.
    3 I have lost all of my interest in other people.

13. ( ) 0 I make decisions about as well as I ever could.
    1 I put off making decisions more than I used to.
    2 I have greater difficulty in making decisions than before.
    3 I can't make decisions at all anymore.

14. ( ) 0 I don't feel I look any worse than I used to.
    1 I am worried that I am looking old or unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I believe that I look ugly.

15. ( ) 0 I can work about as well as before.
    1 It takes an extra effort to get started at doing something.
    2 I have to push myself very hard to do anything.
    3 I can't do any work at all.
16. ( ) 0 I can sleep as well as usual.  
1 I don't sleep as well as I used to.  
2 I wake up 1 - 2 hours earlier than usual and find it hard to get back to sleep.  
3 I wake up several hours earlier than I used to and cannot get back to sleep.  

17. ( ) 0 I don't get more tired than usual.  
1 I get tired more easily than I used to.  
2 I get tired from doing almost anything.  
3 I am too tired to do anything.  

18. ( ) 0 My appetite is no worse than usual.  
1 My appetite is not as good as it used to be.  
2 My appetite is much worse now.  
3 I have no appetite at all anymore.  

19. ( ) 0 I haven't lost much weight, if any, lately.  
1 I have lost more than 5 pounds.  
2 I have lost more than 10 pounds.  
3 I have lost more than 15 pounds.  

I am purposely trying to lose weight by eating less.  
Yes _____ No _____  

20. ( ) 0 I am no more worried about my health than usual.  
1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.  
2 I am very worried about physical problems and it's hard to think of much else.  
3 I am so worried about my physical problems, that I cannot think about anything else.  

21. ( ) 0 I have not noticed any recent change in my interest in sex.  
1 I am less interested in sex than I used to be.  
2 I am much less interested in sex now.  
3 I have lost interest in sex completely.
APPENDIX D

SELF-EVALUATION QUESTIONNAIRE
Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

<table>
<thead>
<tr>
<th>Statement</th>
<th>NOT AT ALL</th>
<th>SOMewhat</th>
<th>VERY MUCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel calm</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I am tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I am regretful</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I feel at ease</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I feel upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I am presently worrying over possible misfortunes</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I feel rested</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I feel anxious</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I feel comfortable</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. I feel self-confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. I am jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. I feel “high strung”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. I am relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. I feel content</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
17. I am worried ................................................................. 1 2 3 4
18. I feel over-excited and “rattled” ......................................................... 1 2 3 4
19. I feel joyful ........................................................................... 1 2 3 4
20. I feel pleasant ......................................................................... 1 2 3 4

21. I feel pleasant ........................................................................ 1 2 3 4
22. I tire quickly ........................................................................... 1 2 3 4
23. I feel like crying ........................................................................ 1 2 3 4
24. I wish I could be as happy as others seem to be .................................. 1 2 3 4
25. I am losing out on things because I can’t make up my mind soon enough ... 1 2 3 4
26. I feel rested ................................................................................ 1 2 3 4
27. I am “calm, cool, and collected” ....................................................... 1 2 3 4

SELF-EVALUATION QUESTIONNAIRE
STAI FORM X-2

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

17. I am worried ................................................................. 1 2 3 4
18. I feel over-excited and “rattled” ......................................................... 1 2 3 4
19. I feel joyful ........................................................................... 1 2 3 4
20. I feel pleasant ......................................................................... 1 2 3 4

21. I feel pleasant ........................................................................ 1 2 3 4
22. I tire quickly ........................................................................... 1 2 3 4
23. I feel like crying ........................................................................ 1 2 3 4
24. I wish I could be as happy as others seem to be .................................. 1 2 3 4
25. I am losing out on things because I can’t make up my mind soon enough ... 1 2 3 4
26. I feel rested ................................................................................ 1 2 3 4
27. I am “calm, cool, and collected” ....................................................... 1 2 3 4
28. I feel that difficulties are piling up so that I cannot overcome them ........ ( ) ( ) ( ) ( )
29. I worry too much over something that really doesn't matter ....................... ( ) ( ) ( ) ( )
30. I am happy ............................................................................................................................ ( ) ( ) ( ) ( )
31. I am inclined to take things hard ....................................................................................... ( ) ( ) ( ) ( )
32. I lack self-confidence ........................................................................................................... ( ) ( ) ( ) ( )
33. I feel secure .......................................................................................................................... ( ) ( ) ( ) ( )
34. I try to avoid facing a crisis or difficulty ............................................................................ ( ) ( ) ( ) ( )
35. I feel blue ............................................................................................................................. ( ) ( ) ( ) ( )
36. I am content .......................................................................................................................... ( ) ( ) ( ) ( )
37. Some unimportant thought runs through my mind and bothers me ........ ( ) ( ) ( ) ( )
38. I take disappointments so keenly that I can't put them out of my mind ...................... ( ) ( ) ( ) ( )
39. I am a steady person .............................................................................................................. ( ) ( ) ( ) ( )
40. I get in a state of tension or turmoil as I think over my recent concerns and