1986

A prospective and retrospective study of attributional style, perceptions of control, social support, and the life events-illness relationship

Barbara Taverna Martin
Iowa State University

INFORMATION TO USERS

While the most advanced technology has been used to photograph and reproduce this manuscript, the quality of the reproduction is heavily dependent upon the quality of the material submitted. For example:

- Manuscript pages may have indistinct print. In such cases, the best available copy has been filmed.
- Manuscripts may not always be complete. In such cases, a note will indicate that it is not possible to obtain missing pages.
- Copyrighted material may have been removed from the manuscript. In such cases, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, and charts) are photographed by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each oversize page is also filmed as one exposure and is available, for an additional charge, as a standard 35mm slide or as a 17"x 23" black and white photographic print.

Most photographs reproduce acceptably on positive microfilm or microfiche but lack the clarity on xerographic copies made from the microfilm. For an additional charge, 35mm slides of 6"x 9" black and white photographic prints are available for any photographs or illustrations that cannot be reproduced satisfactorily by xerography.

Martin, Barbara Taverna

A PROSPECTIVE AND RETROSPECTIVE STUDY OF ATTRIBUTIONAL STYLE, PERCEPTIONS OF CONTROL, SOCIAL SUPPORT, AND THE LIFE EVENTS-ILLNESS RELATIONSHIP

Iowa State University PH.D. 1986

A prospective and retrospective study of attributional style, perceptions of control, social support, and the life events-illness relationship

by

Barbara Taverna Martin

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major: Psychology

Approved:

Signature was redacted for privacy.
In Charge of Major Work

Signature was redacted for privacy.
For the Major Department

Signature was redacted for privacy.
For the Graduate College

Iowa State University
Ames, Iowa

1986

TABLE OF CONTENTS

INTRODUCTION

Definitions and Conceptualizations of Stress

Stress has been defined/conceptualized in a number of different ways. Lazarus and Folkman (1984, p. 19) noted that "psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being." More simply, Selye (1976, p. 1) defined stress as "the nonspecific response of the body to any demand." According to Hackett and Lonborg (1983), there are four general approaches to defining and conceptualizing stress: Selye's, individual characteristics, life events stress, and an interactional model. Each of these will be summarized below.

Selye's Physiological Model

Selye (1976) conducted extensive research on nonspecific (common) reactions to a number of different illnesses. From this work, he developed the General Adaptation Syndrome (GAS) which is a model of the bodily reactions that result from environmental stress. The three stages in this model are the alarm reaction (which consists of the physiological mobilization of the body's defenses), the stage of resistance (which occurs when the body adapts to the stressor and consists of localization of the stress reaction to as small an area of the body as possible), and the stage of exhaustion (which consists of a decrease in the body's resistance and symptoms similar to the first stage).

Individual Characteristics

In addition to the GAS, specific individuals may have special reactions to stress. The individual characteristic approach recognizes that individual differences may influence a person's reactions to stressors (McLean, 1979). Certain individuals may be sensitive or vulnerable to certain types of stress. Some of the individual characteristics that may contribute to vulnerability for stress are Type A behavior patterns, learned helplessness, gender, age, locus of control, and coping skills (Abramson, Seligman, & Teasdale, 1978; Friedman & Rosenman, 1974; McLean, 1979).

Life Event Stress

Individuals who are more vulnerable to stress may be more likely to develop illnesses. According to the Life Event Stress model, environmental events that people experience can produce stress reactions and later illnesses. There is a vast amount of literature that focuses on the life events-illness relationship. In general, results indicate that life stress is related to diverse physical and mental conditions. The central theme of much of this research is that experience of one or more events of varying severity may increase one's chances of developing some physical or mental condition. Rahe and Arthur (1978) attempted to map out the developmental processes relating life stress to illness behavior. However, the issue of whether life stress causes illness is still debated in the literature (Brown, Harris, & Peto, 1973a; Murphy & Brown, 1980; Nelson & Cohen, 1983). Also, correlations between life

stress and illness tend to be fairly small, .30 or less. These correlations indicate that life stresses typically account for maximally 10% of the variance on illness indices.

Various researchers within this model have defined life stress as a change construct (Holmes & Rahe, 1967) or as an undesirability construct (Mueller, Edwards, & Yarvis, 1977). Considering life stress as change assumes that any event that causes change or some adaptive coping on the part of the individual will produce stress, regardless of the desirability of that event. As an undesirability construct, life stress is seen as those events that are believed to be undesirable by an individual. Perkins (1982) noted that many researchers consider life events to be "nonspecific stimuli" in that the events are believed to have the same impact on different people. Recently, however, others have tried to include the variables of undesirability and impact in the development of life stress measures (Sarason, Johnson, & Siegel, 1978). Change, desirability, and impact will be discussed in more detail in a later section.

Interactional Model

An aggregate model has been proposed that encompasses aspects of individual characteristics and life event stress. Lazarus and Folkman (1984) have developed a model in which both environmental stressors and individual dispositions, such as cognitive appraisal, interact to produce stress reactions. Encounters with stressors lead to cognitive appraisals, which lead to stress reactions (physiological, cognitive,

and behavioral), which finally lead to cognitive reappraisals (Hackett & Lonborg, 1983).

Stressors can be environmental or internal demands. Whenever a person encounters an event, they will go through primary and secondary appraisal (Lazarus & Folkman, 1984). Primary appraisal concerns an evaluation of the implications of the event on a person's well-being. The three types of primary appraisals are irrelevant, benign-positive, and stressful. If an encounter is irrelevant or is appraised as being positive, the appraisal falls within the first two types. Otherwise, stressful appraisals involve harm/loss, threat, or challenge.

Secondary appraisal concerns identifying what a person can do about the event (i.e., what resources or coping skills are available). This type of appraisal involves identifying what coping options are available, whether or not one could successfully utilize a certain strategy, and what one believes the outcome of the strategy will be.

How a person appraises a stressor may have a direct impact upon how one reacts to the stressor. In addition, by reappraising an event, through the use of new information, an event that was once appraised as a threat can be reappraised as an irrelevant or benign-positive event. Thus, according to this model, cognitive appraisals and physiological, cognitive, and behavioral reactions to events interact to create the stress process.

General Life Stress-Illness Models

Others have developed models which take into account the interaction of life events and variables other than cognitive appraisal. Dohrenwend and Dohrenwend (1981) identified six separate hypotheses about the life stress-illness relationship. The "victimization hypothesis" suggests that severe stressful life events themselves cause later illness. The "stress-strain hypothesis" is a model which suggests that psychophysiological strain mediates the life stress-illness relationship. The notion that the presence of certain social situations or personal dispositions may moderate the impact of stressful life events on illness is identified as the "vulnerability hypothesis." The "additive burden hypothesis" states that social situations and personal dispositions add to the impact of stressful life events on illness, whereas the "chronic burden hypothesis" suggests that stable social situations and personal dispositions themselves cause illness, regardless of the presence of stressful life events. Finally, the "proneness hypothesis" suggests that the presence of illness leads to stressful events, which in turn create more illnesses.

The Life Stress-Illness Model Utilized in the Present Investigation

The present investigation involved a test of the vulnerability hypothesis using a number of moderating variables. This hypothesis states that certain personal dispositions or social situations may make some people more vulnerable to life stress than others. These

dispositions and situations should have moderated the life stress-illness relationship.

The interactional model proposed by Lazarus and Folkman (1984) suggests that cognitive appraisals may have an impact on stress reactions. In contrast to the primary and secondary appraisals hypothesized by their model, the present study investigated the impact of cognitive appraisals of the causes of the life events experienced by the subjects. That is, individuals with different appraisals concerning the causes of life events may have had different reactions to the same life events. The specific appraisals investigated in the present study were based on the three attributional dimensions noted in the reformulated learned helplessness hypothesis (Abramson et al., 1978): internal-external, global-specific, and stable-unstable. Where people tended to fall on each of these dimensions constituted their attributional style. Attributional style was considered an individual difference variable, which made the present study fall under the individual characteristics approach. In addition, how subjects appraised the amount of control they had over the causes of their life events was studied.

As noted earlier, the vulnerability hypothesis suggests that social situations may moderate the life events-illness relationship. The present study also investigated the impact of the amount and type of social support on this relationship.

In general, however, the present investigation fell under the life stress approach. It followed retrospective and prospective research designs utilized in past investigations of the life stress concept of stress. In fact, the vulnerability hypothesis was taken directly

from life stress-illness research. Thus, methodological problems and past retrospective and prospective research findings will be discussed as a review of this area.

Measurement of Life Stress — Methodological Concerns

Inventories

The sampling and assessment of life events is a complex task. Representative sampling of relevant events is crucial, but often difficult to achieve. One possible solution is to include an open-ended question at the end of the scale that allows subjects to note any idiosyncratic events that occurred to them (Sarason, Johnson, & Siegel, 1978). No one inventory includes all of the events that cause stress in a given population (Hough, Fairbank, & Garcia, 1976), although some researchers modified life event measures in order to make these measures more relevant to specific populations (Cochrane & Robertson, 1973; Rahe, 1969). Quantification poses other concerns about whether or not the events are actually independent of one another (e.g., when one gets a divorce, one may have to move out of one's house; these events are not independent) and whether or not the effects of life events are additive (Brown, 1981).

Finally, the issue of contamination or confounding of stress and symptom, as well as cause and effect, is prevalent in the literature on life stress. Contamination occurs when symptoms of the illness are included in the life events measure (Dohrenwend & Dohrenwend, 1978; Lehman, 1978; Mechanic, 1975; McLanahan & Sorensen, 1984; Zimmerman,

1983). This limits the inferences that can be made from the results. Dohrenwend and Dohrenwend (1978) suggest that researchers should separate out those events that are confounded with psychiatric and physical illness from those that are not.

In general, little research has been completed on the impact of life event-symptom confounding on the life event-illness correlations (Zimmerman, 1983). One example of such a study was completed by Zimmerman, O'Hara, and Corenthal (1984). When confounding items (i.e., items strongly related to symptoms) were taken out of a life events scale, the correlation between life events and depression was not significantly lowered. However, Schroeder and Costa (1984) showed that only inventories with health-related, neuroticism-related, and subjective events were correlated with physical illness.

Related to contamination is the notion that the event itself may be due to the developing disorder instead of vice versa (McLanahan & Sorensen, 1984). When events and illness occur close to one another in time, researchers are unable to determine which of the two precedes the other.

Methodological concerns in studying life stresses include not only sampling quantification and confounding problems, but also problems of research design.

Retrospective Designs

The majority of early life stress-illness studies used the retrospective design approach. Retrospective designs require subjects

to remember life events that happened over a certain time period. Stone (1982), like others, questions the validity and possible inferences about causality that can be made from results using this approach. Memory and forgetting cause validity problems. For example, Monroe's (1982a) results showed marked decreases in life event scores for more distant time periods in that subjects recorded less events for more remote periods. Desirable events showed the greatest rate of decline. Jenkins, Hurst, and Rose (1979) had air traffic controllers retrospectively report life events for a single 6-month period at two different times that were nine months apart. They underreported, that is, reported 34-46% less life stress on the second assessment as compared with the first. In addition, Funch and Marshall (1984) stated that fall-off in reporting of events may depend on the saliency of the event.

One must question, however, whether these results are due to simple forgetting or whether selective distortion, underreporting, or "effort after meaning" (in which new information influences the remembrance of old) are also contributing to the decrease in reporting. Brown, Sklair, Harris, and Birley (1973b) pointed out that patients may exaggerate the significance of events in order to come to terms with their present illness. Thus, they will be able to rationalize why they are "sick" so that others will believe there was good cause for them to become ill. This source of invalidity in which a subject reports more disturbing events to explain their illness was termed direct contamination by Brown (1974). Also, retrospective designs may magnify typical sources of error such as selective memory, denial

of certain events, and overreporting to justify a current illness (Rabkin & Struening, 1976). Thus far, researchers have not adequately separated out the contributions of these factors to the substantial decrease in reporting of life events over time.

Other questions concern the validity and consistency of retrospective responses. Substantial statistical agreement was found between two different administrations of a life events inventory given to physicians who were asked to recall events over a ten-year period (Casey, Masuda, & Holmes, 1967). Events consistently responded to appeared to have the highest life change scores, which may be due to the saliency of these events. Concerning validity, Hudgens, Robins, and Delong (1970) demonstrated 57% intra-pair agreement between patients and their informants about stressful events. Thirty-one percent of their data was given only by informants and could have been lost had they only interviewed the patients. In general, about 20-30% of information can be gained by interviewing a significant other (Zimmerman, 1983). One must keep in mind, however, that intra-pair agreement is not a good validity or reliability indice because it does not take into account any chance agreement between people. Rahe (1975b) also noted that when interviewers probed into the life events checked by subjects, they seldom found events checked that had not occurred. The point is that unverified events may lead one to question the validity of results in retrospective designs (Stone, 1982). Unverified events and decreases in reporting events over time continue to be major concerns when using retrospective research designs.

Another problem with retrospective designs is the difficulty in

establishing whether life events or onset of illness came first (Zimmerman, 1983). Establishing the date of illness onset is very difficult.

One must keep in mind these methodological issues when dealing with the life stress-illness literature. However, much research has been done on developing life events inventories and in designing studies to investigate this relationship.

Life Events Inventories

Various inventories were developed to quantify and standardize the construct of life stress. As mentioned before, some dealt with life stress as a construct of change, whereas others centered on it as a construct of desirability.

Social Readjustment Rating Scale and Schedule of Recent Experiences

Two of the earliest and most widely used life stress inventories are the Social Readjustment Rating Scale (SRRS) (Holmes & Rahe, 1967) and the Schedule of Recent Experiences (SRE) (Rahe, 1975a). Both focus on change in that each life event item included on the inventories is considered to require some adaptive or coping behavior on the part of the person who experiences them, regardless of the direction of the change. The SRRS was developed by having 394 subjects rate 43 life events on the degree of necessary readjustment using marriage (with an arbitrary value of 500) as the fixed comparison point. For example,

if a person thought that the death of a spouse caused twice as much change or readjustment as marriage, then they would rate this item 1000. (See Holmes & Masuda, 1974, for details on the development of the SRRS.) The average ratings of all subjects taken together were then called Life Change Units (LCUs) for each item. The SRRS is actually a rating scale that is used to determine the LCU values of items that are checked by subjects on the SRE. The SRRS and SRE have the same items; thus, the LCU ratings of the SRRS, based on Holmes and Rahe's (1967) subjects, are used to score the SRE.

The SRE asks subjects to record the number of events that have occurred to them in a given time period. Each event checked is then given an LCU score based on the average SRRS ratings. LCUs are then summed to obtain the total life change score for each subject. Overall, the SRE appears to be a conservative estimate of subjects' recent life changes (Rahe, 1974).

Problems with the SRE and SRRS

Although the SRRS and SRE are two of the most frequently used instruments, a number of issues have been raised that question their present usefulness. First, Dohrenwend, Dohrenwend, Dodson, and Shrout (1984) noted that the SRE is very confounded with symptoms of psychological disorder. Second, the SRE and SRRS were developed with the notion that change is disruptive regardless of the direction of that change. Recent investigators suggested that stressfulness may depend on whether a person is moving from a positive to a negative state. However, Zeiss

(1980) concluded that the SRE actually measures aversiveness of life events, not the amount of change they entail. In addition, the SRE has a number of mixed events that could be interpreted as either positive or adverse change (e.g., a major change in health or behavior of a family member) (Mechanic, 1975).

Thus, the notion that life stress is a construct of desirability was developed. Desirability is a very complex construct because it is based on a subject's viewpoint. Different subjects will define desirability differently, so ratings cannot be based on a separate sample of subjects. Gersten, Langner, Eisenberg, and Orzeck (1974) concluded that undesirability was a better measure of stress than the amount of change. A number of other investigators have found more significant relationships between undesirable events and illness than with desirable events (Monroe, 1982a; Monroe, Imhoff, Wise, & Harris, 1983; Vinokur & Selzer, 1975). Using some of the items from the SRE, Mueller, Edwards, and Yarvis (1977) found that undesirable events correlated higher with criterion measures, such as Langner's (1962) psychiatric screening scale, than desirable or total events. In fact, the relationship between life events and psychological functioning was almost totally dependent on undesirable events. Tausig (1982) concluded that undesirable events were significantly better predictors of depression than desirable or ambiguous events. He also noted that there existed no significant differences between subjective (personal ratings) and objective (counting the number of events) scorings of desirability. Suls and Mullen (1981) added the variable of control (i.e., whether the event was caused by the subject or not) using both retrospective and prospective designs.

Correlations between total life change and illness were nonsignificant. Only when events were considered undesirable and uncontrollable were any significant correlations discovered. Apparently, this combination may increase the risk of psychological symptomatology. However, Dohrenwend (1973) demonstrated that life change itself produced a higher correlation than undesirability when using LCU scores. She concluded that life change is more useful than desirability for measuring stressfulness. In general, the few studies that have compared the impact of desirability versus readjustment (i.e., change) show that psychological impairment is more related to undesirability than change itself (Zimmerman, 1983). This issue has yet to be resolved, yet the fact remains that the SRE and SRRS do not take desirability into account.

The use of weighted scoring systems, such as LCUs, has also been questioned. A number of investigators found similar correlations between life events and illness regardless of whether they used a weighted system (LCU or individualized ratings) or simply counted the number of events (Lehman, 1978; Lei & Skinner, 1980; Mueller, Edwards, & Yarvis, 1977; Rahe, 1974; Zimmerman, 1983). In addition, high intercorrelations between results using a weighted scoring system and those obtained by simply counting events have reached levels of .85-.90 (Cooley, Miller, Keesey, Levenspiel, & Sisson, 1979; Vinokur & Selzer, 1975). Some researchers suggest that allowing individuals to weigh their own experienced events is better than using weightings based on a separate sample because age groups tend to show extreme variability in ranking (Sands & Parker, 1979-80) and because subjective

weights reflect more on the impact of events rather than just the number of events experienced (Zimmerman, 1983). Dohrenwend and Dohrenwend (1974) and Stone (1982) noted drawbacks with both weighted systems (individual or group) in that personal weights in retrospective studies may be affected by recall bias and "effort after meaning," whereas group weights are not adequate due to the large variability around the means of event weightings. Cleary (1981) concluded that if the absolute value of the LCU is important, then weightings should be taken from the present sample. However, if one is interested in the relative status of two or more groups or in correlations with another dependent variable, standardized weights are applicable. These studies seem to leave the final decision on scoring systems up to each independent researcher.

Finally, as mentioned earlier, many researchers did not take into account the personalized impact events may have on different individuals. In addition to perceiving events differently in terms of desirability, events can also be perceived differently concerning the amount of disruption the events cause in the lives of the individuals who experience them. This is personalized impact. Stronger associations between life stress and psychological symptoms can be found if the personal impact of events are considered (Byrne, 1984).

These issues concerning change vs. desirability, weighted scoring systems, and personal impact led to the development of the Life Experiences Survey (LES) (Johnson & Sarason, 1979; Sarason, Johnson, & Siegel, 1978).

Life Experiences Survey

The LES is based on the notion that people will respond differently to the same events; therefore, the LES measures both the impact and desirability of experienced life events. The LES is a 57-item self-report measure (with 10 items specifically directed at college students) in which subjects rate events that have occurred to them over the last year (divided into 0-6 month and 7-12 month periods) on whether the event was perceived as positive or negative (desirability) and what the perceived impact on their life was when the event occurred. Ratings range from extremely negative (-3) to extremely positive (+3) (thus, using a semi-weighted scoring system). Positive, negative and total life change scores can thus be obtained by summing across appropriate ratings. This scale has been suggested as being very appropriate for use with student samples (Monroe, Imhoff, Wise, & Harris, 1983):

A number of variables have been investigated using the LES (Nelson & Cohen, 1983; Norbeck & Tilden, 1983; Taverna, 1983). Siegel, Johnson, and Sarason (1979) induced elated and depressed moods in their subjects by having them read aloud and then concentrate on the mood (depressive, elated, or neutral) of various statements. According to differences in scores on mood inventories taken before and after the induction, these procedures were successful in changing subjects' moods. Subjects were also given the LES before and after induction. Results showed that mood state did not affect responses to the LES.

Sarason, Johnson, and Siegel (1978) administered the Psychological Screening Inventory (PSI) (Lanyon, 1970) to undergraduate students.

Negative life change scores correlated significantly with scores on the Social Nonconformity (Sn) and Discomfort (Di) scales of the PSI, whereas the PSI Expression (Ex) scale correlated significantly with positive life change scores. Their results showed that negative life change was associated with certain types of psychological maladjustment. In addition, it appears that extraverted individuals experienced more positive life change than introverted ones.

Passer and Seese (1983) found that negative life changes discriminated between injured and noninjured varsity football players. Zarski (1984) reported significant correlations between the LES and somatic symptoms. Finally, Monroe et al. (1983) found significant correlations of the LES with depression using a sample of college students.

The LES has also been studied in regard to variables other than illness. For example, Taverna (1983) and Beehr (1983) found that positive and negative life stress were related to social desirability. In addition, positive life stress was related to the attributional style of globality, whereas negative and total life stress were related to the attributional styles of upset, globality, intentionality, and uncertainty (Taverna, 1983).

In addition to concentrating on the development of life stress inventories, researchers focused their attention on designing and carrying out studies to support the existence of a life stress-illness relationship. This research can be discussed and conceptualized with respect to retrospective and prospective designs.

Previous Research

Retrospective Designs

Life Stress and Psychological and Physical Illness

As noted previously, most of the earlier research completed on life events-illness relationships used retrospective designs. This research tended to support the existence of a relationship between the two concepts. Whereas early investigators found relationships between physical illness and life stress (Rahe & Holmes, 1965), later research demonstrated that the magnitude of life events was also related to the severity of observed psychopathology (Harder, Strauss, Kokes, Ritzler, & Gift, 1980; Myers, Lindenthal, & Pepper, 1971; Ulenhuth & Paykel, 1973a) and depression (Cohen & Hoberman, 1983; Zimmerman et al., 1984).

In fact, retrospective life stress-illness research has often shown a clustering of stressful life events within two years before illness onset (Rahe, McKean, & Arthur, 1967). The actual time period may depend on the type of illness. For example, pulmonary tuberculosis and cardiac disease patients showed a clustering of life events in the final year before onset, whereas dermatology patients showed the clustering 2-1/2 years before onset (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964). A number of studies using Navy enlisted men demonstrated that life stress mounted in intensity 6 months prior to an illness and then dropped off within the next 6 months after the illness (Rahe, 1969, 1975a; Rahe & Arthur, 1968). Similar results occurred with psychiatric inpatients (Harder et al., 1980). Rahe (1969) had physicians

fill out the SRE and then list major physical ailments over the last 10 years. A monotonic relationship between the magnitude of life crisis and risk of health change appeared in his results. Matias (1978) also found a monotonic relationship between events and severity of psychopathology using students from a university counseling service. However, Wildman and Johnson (1977) discovered a nonmonotonic relationship between life change scores and scores on Langner's Mental Health Index (Langner, 1962). According to these researchers, one explanation of the curvilinear relationship is that life change may have to reach a certain threshold before having a negative influence. Moderate levels of change appear to have less impact than low or high levels.

Others attempted to confirm the relationship between life stress and illness by comparing the number of life events that patients experienced prior to illness onset and the number of events experienced by nonpatients in the same period of time. In one study, patients exhibited much higher stress scores than nonpatients (Ulenhuth & Paykel, 1973a). Overall symptom intensity was positively related to stress scores, whereas the symptom profile (i.e., type of illness) was not (Ulenhuth & Paykel, 1973b). In another study, patients had a higher incidence of instability in interpersonal relationships, but not on work stability (Morrison, Hudgens, & Barchha, 1968). In addition, neurotic psychiatric patients had significantly more life events occur in a designated three-month period than the control group (Cooper & Sylph, 1973). However, Fontana, Marcus, Noel, and Rakusin (1972) concluded that although patients tended to have a larger total number of events occur in the past year than a control

group, pathology appeared to generally be unrelated to the number of events.

Some researchers have begun to look at sex differences in vulnerability to stress. Kessler and McLeod (1984) disputed earlier findings that women are more vulnerable to stress. Instead, they found that women were only more vulnerable to "network events" in which someone in their social network was in trouble.

The above results tend to support a significant relationship between life stress and future illness; however, other investigators found negative results using retrospective designs. Aponte and Miller (1972) found no significant correlation between the number and severity of symptoms and scores from the SRE. Garrity, Marx, and Somes (1978) collected correlations between behavioral pathology and life events prior to and after the events occurred. No significant differences were found between the correlations. This finding questions whether life stress actually leads to illness or vice versa; however, overall, there does appear to be a relationship between life stress and psychological and physical well-being.

Often researchers attempted to correlate life event inventories with specific measures of psychological and physical functioning in order to provide more evidence for the life stress-illness relationship. Measures that are directly related to the present study are discussed below.

Physical Illness and the Seriousness of Illness Rating Scale

One such instrument used in studying the relationship between life change and physical illness is the Seriousness of Illness Rating Scale (SIRS) (Wyler, Masuda, & Holmes, 1968, 1971). A number of investigators found significant relationships between life change and seriousness of illness using this measure (Kobasa, Maddi, & Kahn, 1982). Stern, McCants, and Pettine (1982) had students fill out the SRE and SIRS for the last three years. The SIRS significantly correlated with total and uncontrollable life change units, and with the stressfulness ratings on all events and uncontrollable events. Taverna (1983) found significant correlations between positive, negative, and total life stress and the SIRS using either a count of the number of illnesses or a sum of the ratings of illnesses. Herbert (1978) found a Rho correlation of .412 ($p < .001$) between the number of life changes and seriousness of illness. Also, significant correlations were found between the SIRS and six-month, one-year, and two-year life change scores using a sample of patients.

Cooley, Miller, Keesey, Levenspiel, and Sisson (1979) completed a separate study in which they scored the SIRS using a simple count of the number of illnesses checked and the summation of seriousness scores (weighted). They found that the number of life events checked correlated significantly with both scoring systems of the SIRS. Schroeder and Costa (1984) found significant relations between life events and the SIRS; however, only when the life event inventory contained health related items. In contrast, Matheny and Cupp (1983) found a correlation of .26 between the SIRS and the SRE. Finally, a

correlation of .33 was found between the SRE and SIRS by Garrity, Marx, and Somes (1978). These researchers noted possible problems with the use of the SIRS. First, some illnesses experienced by students are not included in the SIRS. Second, some of the items lack specific definitions (e.g., a burn could be superficial or third degree). They conclude that a simple incidence measure could be just as effective. Overall, though, research, has noted a significant relationship between life events and physical illness as measured by the SIRS.

Psychological Stress and Psychophysiological Symptoms

An instrument used in the life events literature to measure mainly psychophysiological (e.g., poor appetite) symptoms is Langner's 22-item Psychiatric Impairment Scale (LPIS) (Langner, 1962; Shader, Ebert, & Harmats, 1971). This instrument was developed as a short screening device of psychological impairment and has been used to measure psychopathology in numerous populations for various research projects. For example, the LPIS has been used to relate life change to psychological strain and distress (Cohen, McGowan, Fooskas, & Rose, 1984; Garrity, Somes, & Marx, 1977; Marx, Garrity, & Bowers, 1975; Wildman & Johnson, 1977). Correlations between the SRRS and SRE and the LPIS range from .22-.41 depending on the scoring system and the type of life event measure (i.e., desirability or change) (Crandall & Lehman, 1977; Dohrenwend, 1973; Lehman, 1978; Mueller, Edwards, & Yarvis, 1977). Suls and Mullen (1981) found no significant relationship between total life change scores and Langner's symptom score; however, life change within the category of undesirable-uncontrollable showed a

significant correlation of .17 ($p < .05$). In contrast, Taverna (1983) found significant correlations between the LPIS and both negative and total life stress (negative and positive). Finally, Liao (1977) found no significant relationships between life change and psychiatric impairment as measured by the LPIS. Generally, these results provide evidence for the existence of a life stress-psychophysiological dysfunctioning relationship.

Life Stress and Depression

In addition to investigating physical and psychological disorders, some researchers have investigated the relationship between life events and depression (Monroe et al., 1983). In a review of such studies, Lloyd (1980) concluded that depressed patients tended to experience more life events compared to schizophrenic and general control groups in the months prior to the onset of the disorder. For example, Paykel, Myers, Dienelt, Klerman, Lindenthal, & Pepper (1969) noted that depressed patients reported close to three times as many events as a matched control group (Paykel, 1974). Suicide attempters represent a specialized depressed group that also tends to experience many life events. Paykel, Prusoff, and Myers (1975) compared a group of suicide attempters, depressives, and a general population control on the number of life events occurring to them six months prior to the attempt, the onset of the disorder, or the research interview, respectively. Suicide attempters reported four times as many events as the control group, and 50% more than the depressives. In addition, correlations ranging from .12 to .45 have been found between the Beck Depression

Inventory (BDI) and life stress inventories such as the LES (Blaney, Behar, & Head, 1980; Taverna, 1983) or the SRRS (Zimmerman, O'Hara, & Corenthal, 1984). However, Persons and Rao (1985) found no significant relationship between life events and depression as measured by the BDI.

Hammen and Mayol (1982) took a different approach in their investigation of the relationship between life events and depression. Generally, the notion is that depressed subjects may perceive events as less under their control, and may take more responsibility for negative events, and less responsibility for positive ones. They classified events from the Life Events Inventory (Cochrane & Robertson, 1973) as either desirable-responsible (Type A), undesirable-responsible (Type B), undesirable-not responsible (Type C), and ambiguous (Type D). They discovered that Type A and D events were significantly negatively correlated with depression, whereas Type B events correlated positively and Type C events were unrelated to depression. Hammen, Krantz, and Cochran (1981) also noted more depression for subjects whose more upsetting event was a Type B versus a Type C. The finding that undesirable-not responsible (i.e., uncontrollable) events were least related to depression runs contrary to most expectations derived from the life stress literature. However, a few investigators have noted that undesirable events that are partly under the control of a subject are often associated with greater psychological stress (Dohrenwend, 1974; Fairbank & Hough, 1979).

Changes in the number of undesirable life events also appears to be related to changes in depression. Lin and Ensel (1984) found that

individuals whose depression decreased over a year showed a similar decrease in the number of undesirable events experienced. The opposite effect was shown for individuals whose depression increased.

Overall, life events do seem to play a precipitating role in the development of depression. A variety of life events, especially those that are undesirable, concern exits or losses, and are threatening, tend to cluster before the onset of depressive disorders (Cadoret, Winokur, Dorzab, & Baker, 1972; Paykel, 1976; Thomson & Hendrie, 1972).

Research has shown significant relationships between life stress and physical, psychological, and depressive illness using retrospective designs. However, as discussed previously, retrospective designs have some inherent problems that make inferences drawn from these results questionable. Due to these problems and the fact that researchers began to seek evidence for a causal relationship between life stress and illness, investigators turned to prospective designs.

Prospective Designs

The usual prospective life stress study assesses persons with respect to the number of life events that have occurred and then follows them over a time period to see if an illness appears (e.g., Byrne, 1984). This type of design is very conducive to making more causal inferences; however, problems such as forgetting can still occur while the person fills out the life event inventory. (See Tennant, 1983, for a review of the relationship between life events and psychological

morbidity using prospective designs.)

An example of a prospective design is a study in which physicians were given the SRE and then asked for health information eight months later (Rahe, 1969). Health changes tended to be significantly associated with higher LCU totals. Norbeck and Tilden (1983) found that life stress was related to pregnancy complications. McFarlane, Norman, Streiner, Roy, and Scott (1980) noted that undesirable events correlated significantly with measures of strain. In addition, life events were found to be related to distress (as measured by the LPIS), the proportion of days subjects had symptoms, and the number of times the subjects visited their physicians (McFarlane, Norman, Streiner, and Roy, 1983). In general, correlations between life events and subsequent illness ranged from .215-.42 for other prospective studies using military men (Cline & Chosey, 1972; Rahe, Biersner, Ryman, & Arthur, 1972).

Cohen, McGowan, Fooskas, and Rose (1984) used a prospective design and found that negative life stress measured at one point in time was significantly related to both depressive and psychophysiological symptoms. Murrell and Norris (1983) showed that the higher the undesirable events in an older adult population, the higher the amount of depression found. Using a longitudinal design, Billings and Moos (1982) found that negative events were positively associated with symptoms. In addition, Monroe (1982b) assessed volunteers from a large corporation on "caseness" (nonpsychotic psychiatric disturbance) once a month for four months. These subjects also filled out a life events inventory for the preceding year. Results showed that for initial noncase subjects,

significant correlations were found between undesirable events in the first six months of the year and the entire year and symptoms, whereas only the total year neutral-ambiguous events correlated significantly with symptoms for the initial case group. This study pointed out the importance of initial assessment.

Delongis, Coyne, Dakof, Folkman, and Lazarus (1982) found that life events were significantly related to overall health status, but not to somatic complaints. In contrast, "hassles" (i.e., undesirable minor events) were significantly related to overall health status and somatic symptoms. Monroe (1983) also showed evidence for the use of hassles for predicting psychological distress. McLanahan and Sorensen (1984) used a lagged model, longitudinal design study and found that many different types of life events were related to later negative changes in psychological well-being.

Other investigators divided their subjects into high and low risk groups based on the number or severity of life change events experienced. This type of study tried to predict who would develop illnesses. For example, high LCU subjects consistently experienced greater illness severity when compared to low LCU subjects (Rahe, 1969, 1975b; Rahe, Mahan, & Arthur, 1970). Over a six-month period in which Navymen were on a cruise, the high risk group developed more illnesses of greater severity than the low risk group (Rahe, 1968). Using a sample of college students classified as high or low change subjects, Marx, Garrity, and Bowers (1975) found that the high change group had the highest mean on health outcome measures.

Not every prospective study, however, has found results supporting

the life stress-illness relationship. Grant, Yager, Sweetwood, and Olshen (1982) found little evidence that life events were causally related to psychological symptoms. Other studies also found no association between life events and disorder (Goldberg & Comstock, 1976; Schless, Teichman, Mendel, Weinstein, & Weller, 1977). As Brown (1981) noted, prospective designs, while they may have some advantage compared with retrospective designs, are not without deficits and do not address all the methodological complexities associated with research in the life events-illness area.

As the preceding discussion shows, research demonstrates a significant relationship between life stress and future illness using both retrospective and prospective designs. Since the relationship has been shown to exist, investigators have now begun to study the sequence of events and processes that occur between onset of life stress and appearance of symptoms or illness.

Moderator Variables

The Vulnerability Hypothesis

The vulnerability hypothesis states that certain social situations or personal dispositions may moderate the impact of stressful life events on illness (Dohrenwend & Dohrenwend, 1981). Individuals with certain attributes may be less at risk for illness when they experience life stress. These attributes help to buffer the effects of stress. Individuals without these attributes may be more vulnerable to stress. In line with this hypothesis, many researchers have turned their at-

tention to investigating moderating variables that may influence the relationship between life stress and illness (i.e., the relationship between life stress and illness may vary depending upon certain characteristics of the individual or the situation).

Dispositional locus of control has been studied in regard to the life stress-illness relationship. Several studies have shown that negative events have stronger adverse effects on externals' psychological functioning than on internals' (Johnson & Sarason, 1978; Sandler & Lakey, 1982). In contrast, Nelson and Cohen (1983) found that locus of control was directly related to psychological health, but independently of negative events. In addition, Kobasa, Maddi, and Kahn (1982) utilized locus of control, along with commitment and challenge dispositions to study the effects of "hardiness" on illness. They found that hardiness buffers the effects of stress.

Three other possible moderating variables are attributional style, general perception of control, and social support. These three variables will be discussed in more detail.

Attributional Style

One variable that may influence the relationship between life stress and illness is attributional style. Attributional style in this context refers to the characteristic way a subject appraises/interprets the causes and consequences of an event. For example, a person may always attribute cause to other people.

Development of Attributional Dimensions — The Reformulated Learned Helplessness Hypothesis

In the process of reformulating the learned helplessness hypothesis, Abramson, Seligman, and Teasdale (1978) developed three attributional dimensions. According to this hypothesis, the depressive attributional style refers to the tendency to make internal, stable, and global attributions for failure, and external, unstable, and specific attributions for success (Peterson, 1982; Seligman, 1981). If uncontrollable events are seen as caused by something about the person (internal), then the resulting depression is likely to include a loss of self-esteem. If the events are seen as stable and/or global, then the depression is expected to be longlasting or pervasive, respectively (Abramson et al., 1978; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982). This attributional style is seen as a risk factor (not a cause) for depressive deficits after a bad outcome has occurred or is anticipated (Peterson & Seligman, 1984; Seligman, Abramson, Semmel, & von Baeyer, 1979). In addition, Persons and Rao (1985) suggest that these attributions may change over time.

Criticisms of the hypothesis have been made. Wortman and Dintzer (1978) questioned some of the assumptions that the hypothesis makes such as whether or not people actually make attributions or whether or not there is a relationship between attributions of causality and subsequent behavior. Later, Peterson and Seligman (1984) showed that people do in fact spontaneously offer explanations of the causes of bad events. In addition, Wortman and Dintzer (1978) and Peterson (1982) both noted that the hypothesis may not consider all of the

attributional dimensions that affect responses to negative events. For example, Peterson, Schwartz, and Seligman (1981) studied the depressive attributional style in addition to characterological and behavioral attributions. They found that only internal, characterological attributions for negative events were associated with depression. Internal, behavioral or external attributions were not. Thus, these attributions may be more complex.

Studies of the Reformulated Learned Helplessness Hypothesis

The results of studies of the reformulated learned helplessness hypothesis show varying results. (See Peterson and Seligman, 1984, for a review.) An example of research that totally supported this reformulation was completed by Seligman et al. (1979). They found that, relative to nondepressed students, depressed students attributed bad outcomes to internal, stable, and global causes. Miller, Klee, and Norman (1982) showed that depressed inpatients were more likely to show a greater depressive attributional style for their most stressful life event, but not to hypothetical events. Raps, Peterson, Reinhard, Abramson, and Seligman (1982) found that depressed patients explained bad events with more internal, stable, and global causes than schizophrenic or nondepressed patients. Finally, Eaves and Rush (1984) showed significant differences between the explanation for bad events given by depressed patients and a control group.

Others have found partial or no support for the reformulated learned helplessness hypothesis (Blaney, Behar, & Head, 1980;

Calicchia & Pardine, 1984; Hammen & Cochran, 1981; Hammen & deMayo, 1982; Hargreaves, 1985; Pasahow, 1980; Rothwell & Williams, 1983). In a study by Hammen, Krantz, and Cochran (1981), perceptions of low control and of globality of causes were associated with depression, but internality and stability attributions were not. Gong-Guy and Hammen (1980) noted that when the most upsetting event was considered, depressed individuals attributed the cause to internal, intended, global, expected, and stable factors more than nondepressed individuals, but this difference disappeared when all events were considered.

Cochran and Hammen (1985) found that less external, more global attributions are directly related to depression, although they were unsure of the direction of influence. The effects of the other attributional dimensions (e.g., stability) appears to be through their interaction with globality.

Persons and Rao (1985) discovered that when a tendency to make external attributions for positive events is coupled with life stress, there tended to be an increase in depressive symptoms in psychiatric inpatients. However, depressed inpatients made less stable attributions for negative events.

Four longitudinal studies found partial support for the hypothesis. In one study, depressed patients tended to attribute more global and uncontrollable causes to events than nondepressed patients (Firth & Brewin, 1982). In the other studies, attributional style for bad events was a predictor of three-month postpartum depression (O'Hara, Rehm, & Campbell, 1982) and stability and globality were predictive of depression in college students (Golin, Sweeney, & Shaeffer, 1981).

Finally, Manly, McMahon, Bradley, and Davidson (1982) studied attributional style and depression prenatally and postpartum and found that attributional style contributed to predicting depression following childbirth. However, Lewinsohn, Steinmetz, Larson, and Franklin (1981) caution researchers because depressive cognitions (including locus of control) do not necessarily predict depression, but may develop concomitantly with depression. Thus, the ability to predict depression from attributional styles may not be as simple as once thought.

Other studies looked at how well depressive symptoms following negative events such as imprisonment, receiving poor midterm grades, or failure of a driving test could be predicted from attributional style. Peterson, Nutter, and Seligman (1982 -- as cited in Peterson & Seligman, 1984) showed that internal, stable, and global attributions for bad events correlated positively and significantly with depression found at the time the subjects were released from prison. Metalsky, Abramson, Seligman, Semmel, and Peterson (1982) investigated the impact of attributional style on depressive symptoms for individuals who received a poor midterm grade on a test. They found that subjects with internal or global attributional styles became more depressed after receiving a low midterm grade, whereas those with other attributional styles showed no depressive moods. They interpreted their findings in terms of a diathesis-stress model. However, Williams (1985) showed, through other analyses, that attributional style was not more related to lowered mood for students who failed the exam than those who did not. Thus, the negative experience was not important. Finally, in a study by Williams and Brewin (1984), no relationships

were found between internal attributions of failure and depressive mood for individuals who failed a driving test.

Problems with Studies of Depressive Attributional Styles

Peterson and Seligman (1984) noted that many disconfirming studies only used single-item questionnaires, thus, explanatory style (i.e., attributional style) was not truly measured. In addition, many longitudinal studies of the predictiveness of explanatory style did not look at bad events, which is a crucial part of the hypothesis. Williams (1985) suggests that simple correlations do not necessarily prove or disprove the theory. Insignificant correlations may simply suggest that something other than attributional style may have created the depression, not necessarily invalidating the RLHH model.

Rothwell and Williams (1983) stress the point that for the depressive attributional style to be related to depression, an uncontrollable event must occur. Otherwise, the attributional style may just produce "depressive proneness." In fact, they found that a tendency to make internal attributions was only associated with depression in a group that had experienced an uncontrollable event (e.g., job redundancy) and not with one that had not.

Attributional Questionnaires

Results may differ depending upon which attributional questionnaire was used. Some studies requested that subjects fill out a questionnaire (Gong-Guy & Hammen, 1980) in which they rated five of their most stressful life events on each of the attributional dimensions using a seven-point scale (Gong-Guy & Hammen, 1980; Hammen & Cochran, 1981;

Hammen, Krantz, & Cochran, 1981; Hammen & Mayol, 1982).

In contrast to the above, the Attributional Style Questionnaire (ASQ) (Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982) asks subjects to rate hypothetical events on the attributional dimensions of internal-external, stable-unstable, and global-specific. (This instrument is described in more detail in a later section.)

The impact of the choice of questionnaire could be particularly strong with research dealing with the moderational effects of attributional style and the life stress-illness relationship. For example, Taverna (1983) completed a retrospective study of these moderating effects using a questionnaire which asked subjects to rate events they experienced on the various attributional dimensions. She found no significant results concerning the moderation effects, although life stress was significantly related to many types of illnesses. It is conceivable that some students may actually experience more uncontrollable, stable, or global events than others; thus, their ratings may reflect the events they experienced and not their general attributional style. This confounding of aspects of events and attributional style could have produced the results. Others have noted that some events do tend to have commonly shared appraisals (Hammen & Mayol, 1982).

More specifically, after a negative event occurs, the person will try to explain why it happened. Peterson and Seligman (1984) note that there are two influences on which particular explanation is chosen. One is what kind of event occurred (i.e., some events such as a death tend to have stable and global causes) and another is the

explanatory style (attributional style) an individual has. The present investigation was interested in the effects of general attributional style of individuals, not in what events trigger what types of explanations. Thus, as an improvement upon the Taverna (1983) study, attributional style was measured using explanations of hypothetical events (that were compared across subjects) and not explanations of events that actually occurred. This is why the ASQ was chosen for this study.

Summary of Attributional Style

How people attribute cause to life events may have a direct bearing on how they react to these events. According to the above discussion, different types of attributions concerning life events may influence various aspects of depression. Thus, there may be an interaction between these three variables. This interaction has not been studied thoroughly, especially concerning uncontrollable, negative events. The present study was designed to study this interaction (i.e., the moderating effects of attributional style) and expand this reasoning to other types of illness behaviors. In addition, a prospective study of the predictiveness of this attributional style for later symptoms was included.

Perceptions of Control

Another variable that may influence (moderate) the relationship between life stress and illness is general perceptions of control (McLanahan & Sorensen, 1984). That is, do subjects who perceive many

of the events that occur to them as uncontrollable or who just tend to perceive hypothetical events as more uncontrollable tend to show stronger relationships between life stress and illness than other people?

As pointed out by Wortman and Dintzer (1978), perceived controllability of a causal factor may be more important than other attributions in predicting deficits; thus, this variable may have a strong influence on the life stress-illness relationship.

Past research on the perception of the controllability of events has shown mixed results (Nelson & Cohen, 1983). Some researchers have found that negative, uncontrollable perceived events had stronger adverse effects on psychological health than negative, controllable ones (Husaini & Neff, 1980; McFarlane, Norman, Streiner, Roy, & Scott, 1980), whereas others have not (Fontana, Hughes, Marcus, & Dowds, 1979; Sandler & Lakey, 1982). Whereas individuals who tended to perceive events as being due to chance (i.e., uncontrollable) showed more depressive symptoms in one study (Monroe et al., 1983), Type C events (that were seen as uncontrollable) were least associated with depression in another (Hammen & Mayol, 1982). In general, however, it appears that uncontrollable events tend to correlate higher with the amount of illness than controllable ones do (Stern, McCants, & Pettine, 1982; Suls & Mullen, 1981).

Moderation effects of perceived control show mixed results too. Nelson and Cohen (1983) looked at perceptions of control over the outcome of life experiences by having subjects rate the controllability of the life events they experienced using a prospective design. They

found that negative events were seen as more uncontrollable than positive ones. However, control perceptions did not moderate the life stress-illness relationship. In contrast, Matheny and Cupp (1983) found moderating effects for perceived level of control. Krause (1985) found that locus of control beliefs did moderate the relationship between stress and depression, but only after social desirability was controlled for. Thus, there are other variables that interact in this research.

As one can see, the impact of perceptions of control on the life stress-illness relationship has not been well-delineated. A majority of the studies that have been done had subjects rate their perceived control of events they actually experienced. The present study also investigated differences in subjects' perceptions of control over hypothetical events.

Social Support

Social support is another variable that has been implicated as a moderator of the life stress-illness relationship. The effects of social support may differ depending on the definition or measurement instrument used.

Definitions of Social Support

Various definitions of social support have been utilized in the literature. An early concept of social support was presented by Cobb (1976) in his review of past literature. He defined support as information that leads the subject to believe that s/he is esteemed

and valued, cared for and loved, and that s/he belongs to a network of communication and mutual obligation.

Researchers in this area have just begun to incorporate other models into the social support literature. For example, Weiss' (1974) Relational Provisions Model has been suggested as a model of social support (Cutrona, 1984). He notes that there are different provisions that can be gained from relationships with others including attachment, social integration, opportunity for nurturance, reassurance of worth, reliable alliance, and guidance. By looking at how many of these provisions an individual receives, one can estimate the social support that person receives.

Other types of social support have been hypothesized in the literature. Some examples include psychological support (i.e., provide information which contributes to the amount of knowledge or to cognitive systems), emotional supports (which augment basic socio-emotional needs) (Cohen & McKay, 1984; Schaefer, Coyne, & Lazarus, 1981), and nonpsychological or tangible supports (i.e., provide material aid) (Cobb, 1976). In general, the types of support that frequently appear in the literature are emotional support, provision of material goods or tangible assistance, cognitive guidance, and socializing (Stokes & Wilson, 1984).

The conceptualization of social support used in the present study included the provision of goods and services, guidance, and expressions of esteem (Barrera, Sandler, & Ramsay, 1981). Social support was seen as a multidimensional concept that incorporated the following ideas noted by Caplan (1976): "The significant others help the individual

mobilize his psychological resources and master his emotional burdens; they share his tasks; and they provide him with extra supplies of money, material, tools, skills, and cognitive guidance to improve his handling of his situation" (pp. 5-6).

Measures of Social Support

As one can see, there are a number of conceptualizations of social support. One problem with the past research is that social support has not been operationalized very well. Throughout the literature, social support has been measured in different ways, usually using instruments developed by the researchers that have unknown reliability or validity. For example, Billings and Moos (1984) studied the frequency of network contacts, number of friends, and two qualitative aspects of social networks (e.g., strength and quality of relationships). Measures such as marital status, frequency of visiting friends, participation in community organizations, or interactions with neighbors have also been utilized (Eaton, 1978; Lin, Simeone, Ensel, & Kuo, 1979; Sandler, 1980).

In addition, various aspects of social support have been measured including receipt of supportive transactions, satisfaction with support received, social support network characteristics, and conflicted versus unconflicted networks (Sandler & Barrera, 1984). As Ell (1984) pointed out, research needs to focus on the subjective nature of social support and not just the presence of sources of social support.

Due to the poor operationalization of social support and the lack of concern for the subjective nature of social support, recently a

few researchers have developed measures of social support that follow directly from the conceptualizations noted above. For example, the Inventory of Socially Supportive Behaviors (ISSB) (Barrera, Sandler, & Ramsay, 1981) is based on Caplan's (1976) ideas which were previously presented and utilizes descriptions of specific, natural helping behaviors. These behaviors cover the types of support noted by Stokes and Wilson (1984) too.

A factor analysis of the ISSB was conducted to determine the structure of social support (Barrera & Ainlay, 1983). Conceptually, based on the support literature, the researchers categorized social support in terms of material aid, behavioral assistance, intimate interaction, guidance, feedback, and positive social interaction. Empirically, through the factor analysis, however, they identified the following types of social support: directive guidance (that includes the conceptual categories of guidance and feedback), nondirective support (including things such as expressions of intimacy, esteem, and trust), positive social interaction, and tangible assistance (e.g., providing money, shelter, etc.).

Another example of the development of social support scales from a specific theory is the Social Provisions Scale (SPS) (Cutrona, 1984; Russell & Cutrona, 1984). The SPS is an objective measure of the six relational provisions identified by Weiss (1974). Research with this instrument has shown that social integration and reliable alliance are strongly predictive of postpartum depression (Cutrona, 1984).

Others have been less interested in operationalizing social support from a specific definition. For example, the Social Support

Questionnaire (Sarason, Levine, Basham, & Sarason, 1981) is a 27-item instrument that asks people to identify individuals upon whom they can rely on in different situations and to specify how satisfied they are with these relationships (Sarason & Sarason, 1984). Another measure of social support is the Interpersonal Support Evaluation List (ISEL) (Cohen & Hoberman, 1983) that measures the perceived availability of supports.

Thus, there are a number of relatively new objective measures of social support currently available. (See Bruhn & Philips, 1984, for a review.) The important notion in the literature today is that social support should be considered a multidimensional concept (Ell, 1984) that has quantitative (e.g., number of relationships) and qualitative (e.g., perceived satisfaction) aspects (Bruhn & Philips, 1984; Singer & Lord, 1984). As Thoits (1982) and Wallston, Alagna, DeVeillis, and DeVeillis (1983) noted, measures of social support should consider the amount, type, and sources of support. Thus, in addition to the various types of support noted earlier, there are also various sources of support including friends, relatives, professional counselors, and community organizations (Hirsch, 1980; Singer & Lord, 1984). In general, several measures of social support should be used (Barrera & Balls, 1983) and the reliability and validity of the measures must be noted (Singer & Lord, 1984).

In general, there has been no consensus over what social support is or how to best measure it. With this caution in mind, studies of the influence of support on the life stress-illness relationship are reviewed.

Influence of Social Support — The Buffering Hypothesis

The actual relationship between social support, life stress, and illnesses has not been clearly delineated in the literature. Various hypotheses have been presented to establish the relationship, but none have found complete support.

The buffering hypothesis has been presented as one explanation of the role of social support in stressful reactions. According to Cohen and McKay (1984, p. 253), "the hypothesis states that psychosocial stress will have deleterious effects on the health and well-being of those with little or no social support, while effects will be lessened or eliminated for those with stronger supports." Thus, social support should moderate the impact of stressful events on illness (Dean & Lin, 1977).

Empirical tests of the buffering hypothesis have brought mixed reviews (Eckenrode, 1983; Wallston et al., 1983). Some empirical support has been found using laboratory manipulated (Kiecolt-Glaser & Greenberg, 1984) or natural support (Cobb, 1976; Dean & Lin, 1977; Eaton, 1978; Hobfall & Walfisch, 1984; Sandler, 1980). For example, Wilcox (1981) found buffering effects of supportive relations on the relationship between life events and psychological distress. Lin and Ensel (1984) discovered that individuals whose depression increased over a year also had a corresponding drop in strong ties support. However, life stress and social support interactions appeared to support an additive effect rather than a buffering one. Gore (1978) concluded that social support modified the severity of psychological reactions to the stressor unemployment. Women who had experienced

severe life stress and lacked a confidant were 10 times more likely to develop an affective disorder than women with any other combination of life stress and presence or absence of a confidant (Brown, Bhrolchain, & Harris, 1975).

Dohrenwend and Dohrenwend (1981) cite a number of studies that show that combinations of high stress with low social support lead to more difficulties than with high social support. Syrotuik and D'Arcy (1984) noted that spousal support did moderate the relationship between some job strains and mental health. Number of friends was an important moderator of the stressfulness of taking final exams (Monroe et al., 1983). Finally, Monroe (1983) found buffering effects of marital support for physical, but not psychological symptoms. Thus, some forms of support may have a protective function.

Others have not found direct support for the buffering hypothesis (Andrews, Tennant, Hewson, & Vaillant, 1978; Costello, 1982; Flaherty, Gaviria, Black, Altman, & Mitchell, 1983; Gad & Johnson, 1980; Williams, Ware, & Donald, 1981). For example, Cutrona (1984) studied the interaction of social support, depression, and postpartum stressful situations and found that the strongest effects of social support were actually only at lower levels of stress. Billings and Moos (1984) found that coping and social resources did not have buffering effects concerning depression. However, stressors, social resources, and coping were additively predictive of depression in that each were directly related to depression.

These mixed results may be due to problems with the methodologies of these studies. Heller and Swindle (1983) noted that two major

problems with these studies are the confounding of independent and dependent measures and confounding of support with measures of other personality characteristics.

Conceptual differences may also lead to the mixed results. Identifying actual versus potential supports may make a difference (Eckenrode & Gore, 1981). Failure to separate the effects of social support from "psychosocial assets" leads to confusion too (Nuckolls, Cassel, & Kaplan, 1972).

Modifications for Studying the Buffering Hypothesis

In response to the above concerns, various researchers have suggested modifications to this basic hypothesis. Thoits (1982) suggests that high, stable amounts of social support present through a crisis period will lessen the impact of life changes. Stable refers to a similar net amount of support during the time period that is measured. By using stable amounts of support, researchers can unconfound the effects of life stress and social support.

Cohen and McKay (1984) suggest that social support will only buffer a stress reaction if it provides resources for fulfilling coping requirements elicited by a stressful event. As noted earlier, there are a number of different types of support and these different types probably have different mechanisms for moderating life stress-illness relationships. Only certain types of individuals can provide these types of support; thus, the specificity of social support may be more powerful than previously imagined.

The previous discussion suggests that researchers must look at

the sources of support and the types of support given, and not just the sheer quantity of support (Cohen & Hoberman, 1983). For example, Cohen, McGowan, Fooskas, and Rose (1984) suggest that perceived availability of support may be more important than perceived amount of support received for buffering the effects of stress. Satisfaction with support makes a difference (Barrera & Balls, 1983; Sandler & Barrera, 1984). In addition, receiving social support from an individual who has also recently been a source of conflict has an important impact on the effect of social support (Sandler & Barrera, 1984). Increases in the number of individuals who provide support and conflict corresponded to increases in symptomatology.

In addition, the stress-buffering effects of social support may differ depending on the subject population, the amount and reciprocity of support, and the type of support, stress, and illness measures utilized (Ell, 1984; Heller & Swindle, 1983; Monroe, 1983; Sandler & Barrera, 1984). For example, Norbeck and Tilden (1983) found buffering effects for tangible, but not emotional support concerning pregnancy complications. Cohen and Hoberman (1983) noted that appraisal, self-esteem, and belonging scales supported the buffering hypothesis for depression, whereas tangible, belonging, and self-esteem did for physical symptoms. The effects of various combinations of these variables has not been delineated in the literature.

Limitations of the Buffering Hypothesis

The buffering hypothesis, as studied in the past, may not be enough to account for all of the data concerning the effects of

social support (Hammer, 1983). Thus, others have attempted to look at other ways social support may affect health. For example, some researchers have begun to study the independent contribution of social contacts to mental health in that an adequate amount of social feedback or support itself may maintain health and normal physiological functioning (Hammer, 1983; Williams, Ware, & Donald, 1981) or that individuals without social support may be at risk because of the stress of having no system (i.e., support is a stressor itself (Singer & Lord, 1984)).

The general finding is that there is a negative relationship between social support and psychological or depressive dysfunctioning (Dean, Lin, & Ensel, 1981; Holahan & Moos, 1981). In fact, social support itself has been found to explain a lot more of the illness variance than life stress (Dean, Lin, & Ensel, 1981; Lin, Simeone, Ensel, & Kuo, 1979). Living at home was the only type of social support that was significantly related to symptoms following final exams (Monroe et al., 1983). Thus, living at home may offer some direct protection. (See Wallston et al., 1983, for a review of social support and physical illness.) However, in at least one prospective study, when initial psychological symptoms were controlled, support no longer predicted the symptoms (Monroe, 1983).

Some researchers have then attempted to see what types of support are related to what types of illness. Greater satisfaction with cognitive guidance was significantly related to lessened symptomatology, whereas greater socializing was more related to higher self-esteem (Hirsch, 1980). In another study, tangible and emotional support

were related to depression and negative morale, but informational support was not (Schaefer, Coyne, & Lazarus, 1981).

Suggestions for Further Research

In conclusion, the impact of social support may be due to its independent relationship with mental health impairment (in that social support is directly related to functioning) (Andrews, Tennant, Hewson, & Vaillant, 1978) or due to its buffering effect on stress. What specific role social support plays is still unknown. However, researchers tend to agree that certain aspects of social support do seem to have a positive effect on mental health. Future research needs to identify what role social support plays (Bruhn & Philips, 1984), what specific aspects of social support are important to this role (e.g., satisfaction with support, frequency of contact, availability of support), and how social support is mobilized (Eckenrode & Gore, 1981). Prospective designs should be utilized (Heller & Swindle, 1983).

There are some other areas of social support that have been identified as future research concerns. Research is lacking concerning the match between specific helping behaviors and specific stressors (Sandler & Barrera, 1984). Research on individual differences in sex, age, and socioeconomic status could be studied within the social support framework (Ell, 1984). Finally, Cutrona (1984) noted that future research could focus on what specific behaviors are seen as supportive and how individual differences may influence individuals' abilities to benefit from social support (Wallston et al., 1983).

Social Support and Attributional Style

As noted above, some researchers suggest that the impact of individual differences should be studied. One type of individual difference concerns attributional style (Peterson & Seligman, 1984). Few studies have been done that consider social support and attributional style. Internal-external locus of control has just recently begun to be studied in relation to social support and life stress. Sandler and Lakey (1982) found that the stress buffering effects of social support were only found for individuals classified as internals. In addition, internals tended to make more coping contacts with individuals following stressful events than externals, even though they may not have a larger number of social resources than externals (Eckenrode, 1983). More research could be done in this area.

PURPOSE OF THE PRESENT INVESTIGATION

The present study was designed to assess the impact of attributional style, perceptions of control, and social support on the life stress-illness relationship. More specifically, the vulnerability hypothesis, which states that certain types of social situations or personal dispositions may moderate the impact life stress has on illness, was investigated to see if certain varieties of attributional style, perceptions of control, and social support actually did make some individuals more vulnerable to stress. Illness variables included psychophysiological, depressive, and physical functioning. Through the use of a retrospective and prospective design, this research provided valuable information concerning why the same stressful event produced different effects. In addition, the research fostered a more complete understanding of the relationship between life stress and illness behavior and led to a better understanding of the impact of different types and amounts of social support on reactions to stress.

UNIQUENESS OF THE PRESENT INVESTIGATION

Data were collected on life stress, illnesses, attributional style, perceptions of control, and social support at two different points in time which were approximately two months apart. There are at least four unique ways that the present investigation differed from studies completed in the past.

General Design

First, the present study examined both positive and negative types of life stress and their relationship to a number of illness behaviors using a retrospective and prospective design. Thus, assessments were made of individuals' present reactions to past life events (retrospective), the impact of anticipated stress on individuals' functioning, and individuals' later reactions to recent and past stresses (prospective).

The use of prospective tests of these relationships allowed for more inferences concerning causal effects. That is, with a prospective design, one can be more certain that the events came before and influenced the illnesses and not vice versa. By giving the same measures of life events and illnesses at two different points in time, one could see whether correlations concerning the predicted relationship (e.g., life stress — Time one and illness — Time two) were stronger than non-predicted relationships (e.g., illness — Time one and life stress — Time two).

Moderator Variables

A second unique aspect of the study involved the inclusion and study of the concurrent effects of three different moderator variables (attributional style, perceptions of control, and social support) at the same time. The interactions between these variables and the influence of each variable and combinations of variables on the life stress-illness relationship were studied retrospectively and prospectively. For example, individuals with different attributional styles or perceptions of control may differentially benefit from social support. To this author's knowledge, no studies have clearly addressed these issues using these variables. As Sarason and Sarason (1984) have pointed out, more studies need to incorporate personality, life experience, and social support variables at one time.

Attributional Style

A third unique aspect of the study pertained to the fact that most studies concerning the reformulated learned helplessness attributional style (i.e., internal, global, and stable) have focused on depression. The present study extended this research to other illness behaviors (e.g., physical and psychophysiological functioning).

Social Support

A fourth and distinct feature of the study focused upon the buffering hypothesis, that states that the effects of stress will be

less for individuals with strong supports than those with weak supports. Unlike other studies, this study used a number of measures of social support such as specific sources, satisfaction with support, amount of support, and type of support. Good tests of the buffering hypothesis with a number of measures of social support are rare. In addition, previous studies often confounded life events and social support in that changes in social support can be a stressor in itself. The present study only looked at stable support, thus minimizing confounding effects. Also, persons' perceptions of helpful types of social supports were investigated. Previously, many researchers explored the amount of helpful behavior subjects received within a certain time period. This approach ignores the notion that individuals may perceive certain types of support as being more helpful for dealing with certain stressors than others. The present investigation took this notion into account and studied the relationship between helping behaviors received and helping behaviors perceived as truly being helpful for each individual.

Thus, this investigation had several unique aspects including the use of a retrospective and prospective design, three moderational variables, both positive and negative life stress, and a test of the buffering hypothesis using several social support measures. These distinct emphases served to differentiate it from prior investigations.

HYPOTHESES

Based on previous research, a number of hypotheses were developed. These hypotheses are discussed in terms of life stress and illness, attributional style, perceptions of control, and social support.

Life Stress and Illness Behavior

As noted in the previous discussion, numerous studies have shown that there is a relationship between life stress and illness. The present study used self-report, paper and pencil measures of psychophysiological, physical, and depressive dysfunctioning in investigating this relationship. These multiple measures permitted a comparison of different life stress-illness relationships. Because of a lack of similar comparisons in the literature, the following general hypothesis was presented:

Hyp 1: The relationship between life stress and illness behavior will vary depending on the domains of functioning and related illness behavior which is assessed.

Many studies have investigated the impact of both desirable and undesirable events. A majority of these studies have shown that undesirable events are more related to illness behavior than desirable events are; thus, the following additional hypothesis was presented:

Hyp 2: Negative life events will show a stronger relationship to subsequent psychophysiological, physical, or mood dysfunctioning than will positive life events.

Few studies have looked at the impact of anticipated stressors.

Prior research suggests that anticipated stressors can have an effect on illness behavior regardless of whether or not the stressor actually occurs. Hypothesis 3 was presented to investigate this notion.

Hyp 3: Ratings of anticipated life stress (both positive and negative) will be significantly related to later psychophysiological, physical, and/or depressive dysfunctioning.

Hypotheses were also developed concerning the investigation of certain moderational variables. The first discussed is attributional style.

Attributional Style

Previous research has shown that there exists a significant correlation between life events and illnesses, although the magnitude of this relationship is low. Thus, only part of the variance in illness behavior appears to be attributable exclusively to life events. Attributions concerning these events may contribute more to illness than the life events themselves. For example, research has shown a significant correlation between life events and depression. In addition, attribution of life events has been related to depression in the way depressed and nondepressed subjects differ in the manner in which they attribute cause to the events which they experience. In general, there appears to be some interaction between these variables such that attributional style may influence the relationship between life events and depression. The present study sought to explore this notion and at the same time investigated the influence of attributional

style on the life stress-psychophysiological and -physical relationships. This research was based on the premise that if a person attributed the cause of events in certain ways (e.g., internally, globally) s/he may react psychologically or physically differently to the stress than a person with a different attributional style. Certain attributional styles (e.g., internal, global, stable) may lead to stronger stressful reactions to life events. If the preceding is true, then the magnitudes of the life stress-illness correlational relationships may be differentiated depending upon subjects' attributional styles. The specific amount of difference or its direction are unpredictable due to the lack of literature on this subject.

Literature on the existence of a relationship between attributional style and depression tends to suggest that attributional style will influence reports of depression. In addition, various studies have shown that internal-external locus of control moderates the relationship between life stress and psychological and physical impairment.

The present study compared the influence of a variety of attributions (e.g., stability, globality) on the relationship between life stress and self-reports of psychophysiological, physical, and depressive dysfunctioning by examining the following hypothesis:

Hyp 4: Attributional style will differentially contribute to the separate relationships between experienced and anticipated life stress and psychophysiological, physical, and depressive dysfunctioning (e.g., the attributional dimensions may have a stronger moderating influence on

the life stress-depression relationship than on the life stress-physical relationship).

In addition, as noted by Rothwell and Williams (1983), the reformulated learned helplessness hypothesis states that in order for the depressive attributional style to be related to depression, an uncontrollable event must occur. Thus, the present study specifically investigated the moderating effects of attributional style between uncontrollable (as perceived by each subject), negative life events and illness and led to the formulation of the following hypothesis:

Hyp 5: Attributional style will influence the relationship between uncontrollable, negative life stress and illness.

Perceptions of Control

Perceptions of control have also been implicated as moderators of the life stress-illness relationship. In fact, research has shown that events that are perceived to be undesirable and uncontrollable are more significantly related to the occurrence of illness than desirable and controllable events (Suls & Mullen, 1981). In the present study, perceptions of control were measured concerning a variety of hypothetical situations included on the ASQ (Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982). The following hypotheses were considered:

Hyp 6: Perceptions of control will moderate the relationship between life stress and various illness behaviors.

Perceptions of control were also measured concerning a variety of events that subjects actually experienced from those listed on the LES. The impact of events that were seen as controllable were then compared to the impact of events seen as uncontrollable as noted in hypothesis 7.

Hyp 7: The relationship between life events that are seen as uncontrollable and later illnesses will be stronger than the relationship between life events that are seen as controllable and later illnesses.

A final moderational variable that was considered was social support. A number of hypotheses were developed.

Social Support

Social support has been implicated as a buffer for the psychological or physical impact of stressful life events in a number of studies (Cohen & McKay, 1984; Cobb, 1976; Hobfoll & Walfisch, 1984). According to the buffering hypothesis, social support may moderate the impact of life events on mental health in that there should be a weaker relationship between life stress and illness for individuals with high levels of social support than with individuals with low levels. However, Thoits (1982) pointed out a number of problems with studies that supposedly tested this hypothesis including a lack of precise definitions of social support and confounding of life event and social support measures. Thoits (1982) proposed a model for testing the buffering hypothesis in which measures of support are taken before

and after the occurrence of events. This model has been incorporated into the present investigation in order to clear up the effects of social support.

More specifically, support can be seen as a multidimensional concept. Many investigators only included one aspect of social support such as the amount of social support (e.g., presence of a confidant — Brown et al., 1975). The present investigation considered the sources and satisfaction with support (through self-report of subject's identification of confidants — CSSM), the frequency of support (as measured by the ISSB), the type of support (as measured by the SPS), and the perception of which behaviors were supportive for each individual person.

In addition, social support and life stress are often confounded in that a change in social support (e.g., death of a family member) may constitute a life stressor. Thus, life events and support may be confounded. One way to minimize this confounding is to study the life stress and illness behavior of individuals who have not experienced a significant change in social supports over the experimental period (i.e., to look at the effects of stable support). A restatement of the buffering hypothesis is then created which states that "the higher the initial level of support and the greater the degree to which this level is maintained throughout a crisis period, the less impact life changes will have upon psychological state" (Thoits, 1982, p. 154). Thus, an additional hypothesis for the present study was:

Hyp 8: Social support will moderate the relationship between life events and illness in that the relationship will be weak for

individuals with high, stable support systems, whereas it will be strong for individuals with low, stable support systems. (This hypothesized pattern implies that high, stable support systems act as a buffer against stress.)

Others have also looked at the relationship between satisfaction with support received and life stress-illness relationships. Results have shown that satisfaction with support does have a buffering effect on individuals' reactions to stress (Sandler & Barrera, 1984). The present study was an attempt to replicate this finding and also study which particular behaviors (e.g., attachment) have a stronger buffering effect. Thus, two additional hypotheses were suggested.

Hyp 9: The relationship between life stress and illness will be stronger for those individuals who are less satisfied with the general support they receive than for those who are more satisfied.

Hyp 10: The buffering effect of social support will vary depending on the type of support received.

Cutrona (1984) suggests that a new area of research concerns which specific social behaviors are perceived as supportive. Researchers have begun to look at what specific types of supportive behaviors individuals experience (Barrera et al., 1981; Sandler & Barrera, 1984), but have not dealt with the possibility that individuals will have different perceptions of the same supportive behaviors. For example, loaning money can be considered a supportive behavior; however, one recipient may value this type of behavior more than another; thus,

the impact of this support may also vary. As Cohen and McKay (1984) pointed out, some individuals may perceive the loaning of money as a threat to their independence; thus, it may be an inappropriate form of support.

The present investigation considered the notion that it is not just the frequency of occurrence of supportive behaviors that may act as a buffer against stress, but the frequency of occurrence of supportive behaviors that the individual values and finds particularly helpful to them.

According to a stressor-support specificity model of the buffering process developed by Cohen and McKay (1984), the buffering effects of social support will only work if certain conditions are present. That is, stressors will elicit certain coping requirements and only those relationships that provide appropriate forms of support will act as a buffer against those stressors. Thus, if the forms of social support that subjects believe are helpful in dealing with a particular stressor are present, that social support should buffer the effects of that stressor for that person better than if less appropriate support is present. The present study was designed to study subjects' perceptions of appropriate and inappropriate support and the frequency of appropriate support received, through examination of the following hypothesis.

Hyp 11: Subjects who receive appropriate (i.e., helpful as defined by the subject) social support for dealing with their most stressful experience will show less psychological and physical dysfunctioning (i.e., a stronger buffering effect) than those who receive less appropriate support.

One area that has not been investigated thoroughly, especially within the framework of the reformulated learned helplessness hypothesis, is the notion that individuals may differ in their ability to benefit from social support (Cutrona, 1984). That is, does the role of social support in moderating the life stress-illness relationship differ for individuals with different attributional styles?

The relationship between differing attributional styles and coping strategies (e.g., use of social support) has not been clearly determined in the literature, although some work has been completed. For example, Parkes (1984) found that in situations they believe to be amenable to change, internals tended to report high levels of direct coping and low levels of suppression of anxiety, whereas the opposite pattern was true for externals.

There appears to be some difference in the way that externals and internals cope with stress. Thus, there may also be differences in the impact of social support for these two groups. In fact, some studies have only found the buffering effects of stress for internal individuals (Sandler & Lakey, 1982). Hence, the following hypothesis was proposed.

Hyp 12: The impact of social support on the life stress-illness relationship will differ for individuals with different attributional styles.

Thus, this study investigated 12 hypotheses concerning the relationship between life stress and illness and the impact of attributional style, perceptions of control, and social support on this re-

lationship. The next section describes in more detail how the investigation was completed.

METHOD

Subjects

The subjects were 305 undergraduate students enrolled in an introductory psychology course at Iowa State University. The subjects were volunteers who, by their participation, became eligible to receive extra course credit. Inclusion in the experiment was through a self-selection process approved by the Iowa State University Human Subjects Review Committee (see Appendix K). The subjects who completed both sessions and for whom complete data was obtained consisted of 157 men and 148 women with an average age of 19.61 (s.d. = 1.87). The subject dropout rate was as follows: 405 attended session one, 351 returned for session two, and 46 were dropped due to incomplete data. Thus, 100 of the initial 405 volunteers either did not return or did not complete the study's questionnaires.

Instruments

Life Experiences Survey (LES)

The life event inventory used was the LES (Appendix A). The LES is a 57-item self-report life event inventory developed by Sarason, Johnson, and Siegel (1978) in which subjects rate the perceived impact of events they have experienced. This instrument was described in more detail earlier in this report. Two reliability studies completed on the LES demonstrated test-retest correlations of .19 and .53 ($p < .001$) for positive change scores, .56 ($p < .001$) and .88 ($p < .001$) for negative change scores, and .63 ($p < .001$) and .64

($p < .001$) for total life change scores (Johnson & Sarason, 1979; Sarason, Johnson, & Siegel, 1978). Taverna (1983) also found an alpha coefficient of .61 for the total LES.

In the present study, subjects were asked to fill out the LES for the last year, which was divided into two time periods: 0-6 months and 7-12 months. Each event was rated on the usual -3 to +3 scale, and total (i.e., both positive and negative), positive, and negative life stress scores were computed for each subject. In addition, subjects were asked to rate how much control they believed they had over each event on a 1 (no control) to 7 (total control) scale.

Anticipated Life Stress

Subjects were also asked questions about stressors that they anticipated would occur in the next two months. No instrument was immediately available to assess anticipated stress; thus, one was developed for this study.

Appendix B contains the inventory developed for this study. Subjects were asked to identify anticipated stressors in five categories: academics, work, interpersonal relations, health, and other. Subjects then replied to five questions relating to each stressor. The second question identified both the amount of stress and desirability of the stress that was anticipated. (This question resembled the scale used in the LES.) Negative anticipated stress was the sum of all of the anticipated stressors subjects had identified and rated as "-1, -2, or -3." Similarly, positive anticipated stress was the

sum of stressors rated as "1, 2, or 3" and total anticipated stress was the sum of positive plus negative anticipated stress ratings.

Relative anticipated stress was computed by averaging the ratings each subject gave to question three over all of their anticipated stressors. Stress anticipation was similarly scored by averaging those ratings each subject gave to question four. Finally, anticipated control was computed by averaging ratings given to question five.

Two months later, subjects were again asked questions one, two, and four for those anticipated stressors that actually did occur within that two-month period. Questions were rephrased in the past tense.

Attributional Style Questionnaire (ASQ)

Attributional style was measured by the Attributional Style Questionnaire (Appendix C). The ASQ was developed by Peterson et al. (1982) and was based on the reformulated learned helplessness model (Abramson et al., 1978). The ASQ measures how people tend to attribute causes of events based on the following attributional dimensions: internal vs. external; specific vs. global; and stable vs. unstable. Subjects were asked to determine a cause for 12 hypothetical situations (6 good outcomes, 6 bad outcomes). Then the subjects rated the cause on 7-point scales for each of the three attributional dimensions. Finally, the subjects were asked to rate the importance of the hypothetical events. Positive (good) and negative (bad) outcome scores on each of the dimensions were determined by averaging across the 6 ratings the subjects

made for each of the dimensions.

Internal consistency coefficients range from .44 to .69 for six-item good or bad events composites for each dimension (Peterson et al., 1982). Alpha coefficients of .75 and .72 have been found for good and bad events, respectively, across all of the attributional dimensions. In addition, test-retest correlations range from .57 to .69 for six-item good or bad event composites for each dimension.

Validity was shown for the ASQ in that causal explanations taken from handwritten, personal accounts of events correlated significantly with corresponding dimensions on the ASQ (Peterson, Bettes, & Seligman, 1982 — as cited in Peterson & Seligman, 1984). In addition, content analyses of interviews concerning bad events correlated significantly with composite scores of the ASQ with a group of clinically depressed people (Castellon, Ollove, & Seligman, 1982 — as cited in Peterson & Seligman, 1984).

The ASQ was modified slightly for the present investigation by including the following question under each hypothetical situation:

How much control do you have over the cause?

1 (no control) 2 3 4 5 6 7 (total control)

Langner's Psychiatric Impairment Scale (LPIS)

Psychophysiological functioning was measured by Langner's scale (Appendix D). T. Langner (1962) reported that the 22-item psychiatric impairment scale was developed to place people on a continuum of impairment in life functioning. The items represent common psychiatric

symptoms that primarily deal with psychophysiological symptoms, such as whether a person is bothered by nervousness or has trouble getting to sleep, but also include feelings of depression and withdrawal. Validity has been demonstrated by comparing a normal functioning group to a group of psychiatric patients. The 22 items clearly distinguished between the two groups. Other validation studies are discussed elsewhere (Langner, 1962). A cutoff point of four on this scale seems to distinguish between "well" and "ill" groups. This measure was included in the present study in order to see how life stress affected a combination of psychological and physical symptoms.

Seriousness of Illness Rating Scale (SIRS)

Physical functioning was measured by the SIRS (Appendix E). Wyler, Masuda, and Holmes (1968) completed research that led to the development of the SIRS. In this study, they had a sample of physicians and a sample of nonmedical people rate 126 physical illnesses using peptic ulcer (with a value of 500) as the fixed point to make proportional ratings on the other items. Due to high correlations between the two samples, a grand rank order and mean for each item were computed by combining the results from the two samples. This list of 126 illnesses and their mean ratings comprise the SIRS. Wyler, Masuda, and Holmes (1970) studied the reproducibility of the SIRS by having two physician samples fill out the SIRS. They found no significant differences in the mean scores on the disease items between the samples. Using a test-retest method, they also found a Spearman rank order

correlation coefficient of .988. They concluded that the SIRS is a reliable measure of the seriousness of illnesses (as estimated by physicians).

A modified version of the SIRS was used in this study because the subjects were students who generally do not experience many of the later numbered illnesses on the SIRS. Thus, only numbers 1-76 were retained and a few blanks were added on for students to note illnesses they had experienced that were not already included on the SIRS. Subjects in the present study were asked to check those illnesses listed on the SIRS that they had experienced during the last six months. Their physical illness scores were then computed by summing the number of items checked. (Because the sum of the number of items checked and the sum of the ratings of these items were so highly correlated in a study by Taverna (1983), only the sum of the number of illnesses checked were used in this study.)

Beck Depression Inventory (BDI)

General depression was measured by the BDI (Appendix F). The BDI was originally developed by Beck, Ward, Mendelson, Mock, and Erbaugh (1961) as a rapid mental health screening device for depressive symptoms. The BDI is a 21-item self-report inventory that has been shown to be a reliable and valid instrument. Beck, Ward, Mendelson, Mock, and Erbaugh (1961) reported a split-half reliability coefficient of .93. Also, each item significantly correlated with the total BDI scale. Bumberry, Oliver, and McClure (1978) noted a significant relationship

between the BDI and clinical judgment ratings of depression in a university student population. The BDI has also been shown to be associated with other depression measures (Davies, Burrows, & Poynton, 1975). Analyses completed in the present study only used the BDI total score.

Social Provisions Scale (SPS)

The type of social support subjects received was measured by the SPS (Appendix G) (Cutrona, 1984; Russell & Cutrona, 1984). This is a 24-item scale that measures the six relational provisions identified by Weiss (1974) including attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance.

Internal consistency as measured by Cronbach's alpha coefficient was .84 for the total score (Russell & Cutrona, 1984). Reliability of the individual provisions were all above .70. Test-retest reliability for the total score for a six-month period was .55 (Cutrona, Russell, & Rose, 1984 — as cited by Cutrona, 1984). However, in another study, test-retest correlations for a 4-6 month period ranged from .37 to .66 for the provision scales (Russell & Cutrona, 1984).

Validity data has also been collected. Weiss (1974) predicted that different provisions should correlate differently with ratings of separate categories. Russell, Cutrona, Rose, and Yurko (1984 — as cited in Russell & Cutrona, 1984) showed that this was the case in that social integration correlated higher than other provisions with perceived quality of friendships and attachment correlated higher with

romantic or marital relations. Sixty-six percent of the variance of scores on a loneliness scale was accounted for by the six social provisions (Cutrona, 1984). The factor structure resulting from a factor analysis of the scale provided evidence for six relatively unique provisions (Russell & Cutrona, 1984). In addition, scores on the SPS correlated with measures of social networks and satisfaction with different types of social relationships.

Inventory of Socially Supportive Behaviors (ISSB)

The frequency of social support subjects received was measured by the ISSB (Appendix H). Barrera, Sandler, and Ramsay (1981) developed this instrument in which subjects were asked to rate the frequency with which each of the 40 items occurred during the last month on a scale from 1 (not at all) to 5 (about everyday). Each of the items were based on the criteria that they be behaviorally specific, not be only applicable to a specific population, and not have explicit references to various states of psychological functioning. Thus, this instrument should not be confounded with measures of psychological dysfunctioning.

The reliability of the ISSB was evaluated by Barrera, Sandler, and Ramsay (1981). A test-retest correlation of .882 was found for the total scale. Test-retest correlations ranged from .441 to .912 for individual items. Internal consistency coefficients were .926 and .940 for the entire scale. Although a majority of the item-total correlations were of a moderate size, seven of the correlations were below .30. Barrera and Balls (1983) also demonstrated an internal consistency

coefficient of .92 using the ISSB.

In order to explore the validity of the ISSB, these researchers also looked at the relationship between the ISSB and social support network indices and perceived family support. Correlations of .42 and .32 were found for the relationships between the ISSB and available and actual social support network size, respectively. In addition, scores on the ISSB correlated .359 with the Cohesion scale of the Family Environment Scale (which measures how supportive and committed family members are to one another).

The ISSB was slightly modified to cover a larger time period for this study. The ISSB given at the first session asked subjects to rate the frequency of support over the past year. The rating scale was only modified by changing 2 — "once or twice" to 2 — "once or twice a month." The ISSB given during the second session covered the last two months and the rating scale was modified the same as that of the first session.

In addition to filling out the ISSB in its regular format, students were asked to complete a modified version. Students chose the most stressful event that happened to them over the past year. Next, they completed the 40 ISSB items using the following instructions and scale: "Please rate the following behaviors based on how helpful you think these behaviors would be for helping you deal with this particular stressful event using this scale — 1 = not helpful.... 5 = very helpful." (These ratings were used to study appropriateness of support for Hypothesis 11.) Finally, they chose the most supportive individual who helped them deal with this stressor. Once again, they completed

the ISSB items; however, this time with the following instructions: "Please rate the frequency with which each of the following behaviors were done for you, to you, or with you by this most helpful individual since your most stressful event occurred." Subjects used this rating scale: 1 = not at all; 2 = once or twice a month; 3 = about once a week; 4 = several times a week; and 5 = about everyday.

Comprehensive Social Support Measure (CSSM)

Another measure of social support was developed for this study to assess the impact of the amount of support, satisfaction with support, ease of getting in touch with supporters, and number of supporters. This instrument was called the CSSM.

Subjects were asked to identify individuals whom they saw as being helpful and supportive to them. For each individual identified, subjects then rated the amount of support the individual gave them (using a 1-5 scale, 1 being no support, 5 being a lot of support), how satisfied the subject was with this support (using a 1-5 scale, 1 being not satisfied and 5 being very satisfied), and how easy each supporter was to get in touch with (using a 1-5 scale, 1 being very hard to get a hold of and 5 being very easy).

An amount of support scale was calculated by averaging the ratings of amount of support over all identified supportive individuals. A satisfaction with support score was calculated by averaging satisfaction with support ratings over all supportive individuals. Similarly, an availability score was developed by averaging the availability

ratings over all supportive individuals. See Appendix I for an example of this inventory.

Marlowe-Crowne Social Desirability Scale (MCSDS)

Social desirability was measured using the MCSDS (Appendix J). Crowne and Marlowe (1960) developed the MCSDS to identify subjects who tend to display a social-desirability response set (i.e., have a need for social approval). It has 33 items, half of which are true, but undesirable statements (15 items), and half of which are false, but desirable statements (18 items). Internal consistency computed by the Kuder-Richardson formula has reached .88. A test-retest correlation of .88 has also been obtained (Crowne & Marlowe, 1964). In addition, correlations between the MCSDS and positive, negative, and total life change as measured by the LES have previously been found to be nonsignificant (Sarason, Johnson, & Siegel, 1978). Finally, a significant relationship was found between the MCSDS and the Defensiveness scale of the PSI (Taverna, 1983).

Procedure

Data was collected during two different sessions that occurred approximately two months apart. (See the "Sequence of Assessments Chart," Figure 1.)

Insert Figure 1 about here

During the first session, the subjects completed all of the inventories in groups of 50 subjects per session. Inventories were given in ten different counterbalanced orders with the exception that the

modified ISSB was given immediately after the LES because it asked for a response given on the LES. Completion of these inventories took approximately one to one and one-half hours. Subjects were given the following general instructions:

> In this study, you will be requested to respond to a number of different surveys. These surveys measure your general well-being at this time and your reactions to various events you may have experienced in the past year. Please read each of the directions carefully and fill out each survey in the order they were presented to you. Your individual answers will be kept completely confidential, so do not put your name on any of the answer keys. Try to answer each question as truthfully and consistently as you can using the appropriate answer blanks. There is no time limit. In addition, you will be asked to return in approximately two months to complete a similar battery of inventories.

Finally, approximately two months after session one, subjects returned and filled out all of the following inventories: LES and ISSB (with modified instructions that asked the subjects to fill out the surveys regarding life events and frequency of social support that occurred during the last two months), SPS, ASQ, LPIS, SIRS, and BDI. (See Figure 1 which depicts the sequence of events.) In addition, subjects responded to the following questions concerning their actual reactions to previously anticipated stressors: (Questions 2, 3, and 4 are comparable to Questions 2, 3, and 5, respectively, that were given during session one.).

One event you previously had anticipated was _____
(I will fill this in for each subject.)

1) Did the event actually occur? _____ yes _____ no (Check one)

If you answered yes, please continue with this event, otherwise go on to the next event.

2) To what extent do you think the event had a positive or negative impact on your life at the time the event occurred? Circle the appropriate rating.

Extremely negative	Moderately negative	Somewhat negative	No impact	Slightly positive	Moderately positive	Extremely positive
-3	-2	-1	0	+1	+2	+3

3) Relative to other stressors you've experienced, how stressful was this event for you? Circle the appropriate rating.

1 (not stressful) 2 3 4 5 6 7 (very stressful)

4) How much control do you believe you had over the occurrence of the event? Circle the appropriate rating.

1 (no control) 2 3 4 5 6 7 (total control)

For purposes of clarification in the next sections, any instruments given at Time one (i.e., session one) will have a (1) after the title (e.g., ISSB(1)), whereas those instruments given at Time two will have a (2) after the title (e.g., LES(2)).

Analyses

Analysis of the data was approached by three methods of statistical analysis. Multiple regression techniques were used for most of the

analyses, Pearson product-moment correlations and t-tests for the rest.

Pearson product-moment correlations were used to investigate Hypotheses 1 and 3. Experienced and anticipated life stress were correlated with the three illness variables. For the prospective data, a regression technique was used in which life stress(1) was correlated with illness(2) and the effects of illness(1) were partialled out. This analysis controlled for psychological disorder present at session one in order to test for a relationship between life stress and later illness (e.g., illness present at session two) (Nelson & Cohen, 1983).

General Linear Model (from the Statistical Analysis System) multiple regression analyses were used to test Hypotheses 4, 5, 6, 8, 9, 10, 11, and 12. Life stress and the moderator variables of attributional style, perceptions of control, and social support represented the independent variables, whereas the three illness measures represented the dependent variables in these analyses. Evidence for moderation effects was collected by investigating the presence of significant interactions between the moderator variables and life stress.

Finally, t-tests were conducted to investigate Hypotheses 2 and 7. For Hypothesis 2, correlations between positive life stress and illness were compared to correlations between negative life stress and illness. For Hypothesis 7, correlations between uncontrollable negative or positive life stress and illness and controllable negative or positive life stress and illness were compared.

These three types of analyses led to the results noted in the

next section. The results presented are consistent with and in the order of the 12 hypotheses presented earlier. The results are divided into the following sections: Illness Variables, Life Stress, and Illness Behavior, Attributional Style, Perceptions of Control, Social Support, and Factors Influencing Responses.

RESULTS

Illness Variables

Three separate illness variables were used: LPIS, BDI, and SIRS. (The SIRS was scored by a simple count of the number of physical illnesses experienced.) Pearson product-moment correlations were computed between all combinations of the three illness variables for both Time one and Time two. Twenty of the correlations were significant at the .05 level. Table 1 presents these correlations. These results suggest that the illness inventories are not measuring separate entities. Instead, there were overlapping sources of variance in depressive, psychophysiological, and physical symptoms.

Insert Table 1 about here

Life Stress and Illness Behavior

Hypotheses 1 and 2 — Life Stress-Illness Associations

Two hypotheses were tested involving life stress and illness:

Hyp 1: The relationship between life stress and illness behavior will vary depending on the domains of functioning and related illness behavior which is assessed.

Hyp 2: Negative life events will show a stronger relationship to subsequent psychophysiological, physical, or mood dysfunctioning than will positive life events.

General Analyses

Examination of Table 2 indicated that of a total of 72 product-moment correlations computed between total, positive, and negative life stress scores at Time one and Time two and scores on the illness variables at both times, 55 or 76% significant correlations were found. (See Table 2 for a summary.) Positive life stress(1) was significantly related to SIRS(1) (r = .22, p < .01) and SIRS(2) (r = .12, p < .05). Positive life stress(2) was significantly related to the BDI(1) (r = .12, p < .05), SIRS(1) (r = .20, p < .05), and SIRS(2) (r = .15, p < .05). Negative life stress(1) scores correlated significantly with the BDI(1) (r = .42, p < .01), LPIS(1) (r = .35, p < .01), SIRS(1) (r = .40, p < .01), BDI(2) (r = .32, p < .01), LPIS(2) (r = .31, p < .01), and the SIRS(2) (r = .32, p < .01). Negative life stress(2) scores correlated significantly with BDI(1) (r = .35, p < .01), LPIS(1) (r = .34, p < .01), SIRS(1) (r = .28, p < .01), BDI(2) (r = .52, p < .01), LPIS(2) (r = .46, p < .01), and SIRS(2) (r = .33, p < .01). Significant relationships between total life stress(1) scores and the BDI(1) (r = .30, p < .01), LPIS(1) (r = .19, p < .01), SIRS(1) (r = .40, p < .01), BDI(2) (r = .25, p < .01), LPIS(2) (r = .21, p < .01), and SIRS(2) (r = .30, p < .01), were observed. Significant relationships between total life stress(2) scores and the BDI(1) (r = .31, p < .01), LPIS(1) (r = .29, p < .01), SIRS(1) (r = .31, p < .01), BDI(2) (r = .39, p < .01), LPIS(2) (r = .35, p < .01), and SIRS(2) (r = .31, p < .01) were also found.

Insert Table 2 about here

When Time one life stress is broken up into 7-12 and 0-6 month periods, the following significant relationships were found. Of the 12 positive life stress correlations computed for both periods, 3 or 25% were significant — one for 0-6 months and two for 7-12 months. Of the 12 negative life stress correlations, all 12 or 100% were significant. Finally, of the 12 total life stress correlations computed, 11 or 92% were significant, 6 for 0-6 months and 5 for 7-12 months. (See Table 2 for a summary.) As one can see, negative life stress was significantly related to more variables than positive life stress. These correlations indicate that life stress was significantly related to depressive, psychophysiological, and physical illness. Life stress was most consistently related to physical illness and Hypothesis 1 has been supported.

Prospective Analyses of Hypotheses 1 and 2

Regression analyses were used to investigate the prospective relationship between Time one and Time two life stress and Time two illness. When illness(1) is partialled out, the following relationships between life stress (1 or 2) and illness(2) still exist: positive life stress(1 — 7-12 months)-LPIS (F (1, 302) = 9.11, p < .01), negative life stress(1 — 7-12 months)-LPIS (F (1, 302) = 4.47, p < .05), total life stress(1 — 7-12 months)-LPIS (F (1, 302) = 8.91, p < .01), negative life stress(1)-LPIS (F (1, 302) = 3.92, p < .05), total life stress(1)-LPIS (F (1, 302) = 4.21, p < .05), negative life stress(2)-LPIS (F (1, 302) = 36.93, p < .01), total life stress(2)-LPIS (F (1, 302) = 15.54, p < .01), positive life stress (1 — 7-12 months)-BDI (F (1, 302) =

4.18, $p < .05$), total life stress(1 — 7-12 months)-BDI (F (1, 302) = 3.99, $p < .05$), negative life stress(2)-BDI (F (1, 302) = 58.31, $p < .01$), total life stress(2)-BDI (F (1, 302) = 20.31, $p < .01$), negative life stress(1 — 0-6 months)-SIRS (F (1, 302) = 6.03, $p < .05$), negative life stress(2)-SIRS (F (1, 302) = 12.90, $p < .01$), total life stress(2)-SIRS (F (1, 302) = 7.55, $p < .01$). Fourteen or 39% of the 36 relationships were significant. (See Table 2.) These results suggest that life stress was related to later psychophysiological illness independently of illness present when the life stress was occurring. This was not true for physical and depressive illness. For these, illness (Time one) was important in predicting illness (Time two).

Positive Versus Negative Life Stress Analyses

Pairwise t-tests were computed between pairs of correlations of positive and negative life stress with the three illness variables. All of the t-tests were significant with negative life stress-illness correlations always significantly higher than positive life stress-illness relationships. The results were as follows: Life stress(1)-LPIS(1) ($t(302) = 7.68$, $p < .01$), life stress(1)-LPIS(2) ($t(302) = 4.86$, $p < .01$), life stress(2)-LPIS(2) ($t(302) = 6.47$, $p < .01$), life stress(1)-BDI(1) ($t(302) = 6.32$, $p < .01$), life stress(1)-BDI(2) ($t(302) = 4.07$, $p < .01$), life stress(2)-BDI(2) ($t(302) = 7.55$, $p < .01$), life stress(1)-SIRS(1) ($t(302) = 2.82$, $p < .01$), life stress(1)-SIRS(2) ($t(302) = 2.89$, $p < .01$), and life stress(2)-SIRS(2) ($t(302) = 2.62$, $p < .01$). These results showed strong support for Hypothesis 2 in

that negative life stress showed a stronger relationship to illness than positive life stress.

Intercorrelations between Life Stress Variables

Correlations were also computed between all types of life stress. All of the correlations were significant: positive(1)-negative(1) (r = .31, p < .01), positive(1)-total(1) (r = .76, p < .01), negative(1)-total(1) (r = .85, p < .01), positive(1)-positive(2) (r = .32, p < .01), positive(1)-negative(2) (r = .23, p < .01), positive(1)-total(2) (r = .35, p < .01), negative(1)-positive(2) (r = .19, p < .01), negative(1)-negative(2) (r = .55, p < .01), negative(1)-total(2) (r = .51, p < .01), total(1)-positive(2) (r = .31, p < .01), total(1)-negative(2) (r = .50, p < .01), total(1)-total(2) (r = .54, p < .01), positive(2)-negative(2) (r = .19, p < .01), positive(2)-total(2) (r = .71, p < .01), and negative(2)-total(2) (r = .82, p < .01). When individuals experienced one type of life stress, they likely experienced other types. Subjects also anticipated future stressors.

Hypothesis 3 — Anticipated Stress

The anticipated stress measure used in this study was developed specifically for this study. Table 3 presents some descriptive information about the average ratings of positive, negative, total, and relative anticipated stress, stress anticipation, and perceptions of anticipated control for each category of stress: academics, work, family/interpersonal relations, health, and other. One will note

that subjects predicted (i.e., noted higher ratings) higher levels of stress for events falling under the categories of academics and other.

Insert Table 3 about here

Hypothesis 3 focused on how anticipated stress was related to illness.

Hyp 3: Ratings of anticipated life stress (both positive and negative) will be significantly related to later psychophysiological, physical, and/or mood dysfunctioning.

Table 4 represents the separate Pearsonian correlations computed between anticipated stress measures and Time two illness measures. The following correlations were significant: negative anticipated stress-BDI (r = .24, p < .01), -LPIS (r = .27, p < .01), and -SIRS (r = .26, p < .01); total anticipated stress-BDI (r = .19, p < .05), -LPIS (r = .19, p < .01), and -SIRS (r = .22, p < .01); relative anticipated stress-SIRS (r = .23, p < .01), stress anticipation-LPIS (r = .13, p < .05), and stress anticipation-SIRS (r = .16, p < .05). Only the relative anticipated stress-SIRS correlation remained significant after the effects of life stress and illness present at Time one were deleted through a regression analysis procedure: $F(1, 297) = 6.78$, p < .01).

Insert Table 4 about here

Although negative and total anticipated stress appeared to consistently correlate with all of the three illness measures, they did not correlate significantly without the added effects of experienced life stress. Thus, Hypothesis 3 was supported, but anticipated stress alone, did not predict later illness.

Intercorrelations between the anticipated stress variables were computed. Seventy-eight percent or 43 of a possible 55 nonredundant correlations were significant. See Table 5 for a summary of these intercorrelations. In addition, correlations between ratings of anticipated stress (Time one) and ratings taken after the anticipated events have occurred (Time two) are included in Table 5. All of these correlations were significant. Time one-Time two correlations were as follows: positive anticipated stress (r = .51, p < .01), negative anticipated stress (r = .62, p < .01), total anticipated stress (r = .51, p < .01), and relative anticipated stress (r = .41, p < .01). These correlations suggest that subjects were good at predicting future stress.

Insert Table 5 about here

The results of analyses conducted between life stress and illness suggest that life stress was related to illness. Negative life stress was more related to illness than positive life stress, and life stress predicted later psychophysiological illness independent of illness present at the time the life stress measure was taken. Anticipated

life stress was related to illness, but not independent of experienced life stress.

Farmer Related Analyses

A secondary exploration that was not part of the original purpose of the study was conducted. Due to the unique aspects of the subject pool and the current depressed economic status of Iowa farmers, potential differences between members of farm families and members of nonfarm families were explored. Farm families may be more stressed because of these difficult economic conditions, although not all Iowa farmers have economic problems or difficulties of similar magnitude.

T-tests were conducted between members of farm families (n = 53) and members of nonfarm families (n = 225) in which the father was not deceased, retired, or unemployed on measures of social support, life stress, anticipated stress and illness. Of a total of 80 t-tests computed, only three were significant: BDI(1) ($t(276) = 2.25$, $p < .05$), anticipated control(2) ($t(276) = 2.14$, $p < .05$), and perception of control of negative life stress ($t(276) = 2.27$, $p < .05$). Members of farm families had more depressive symptoms and tended to believe they had more control over negative life stress and over events they actually experienced or that they had anticipated would occur.

The remainder of the analyses, for the entire sample and total project, focused on effects of moderator variables on the life stress-

illness relationship. Attributional style was the first moderational variable studied.

Attributional Style

Reliability of the ASQ

To determine the internal reliability of the ASQ, coefficient alphas (Cronbach, 1951) were computed for each attributional dimension (e.g., internality, stability, globality) at each time period. The alphas were as follows: internality(1) = .34, internality(2) = .39, stability(1) = .47, stability(2) = .56, globality(1) = .59, and globality(2) = .65.

Similar attributional measures were taken at both Time one and Time two. When the measures of each of the three attributional dimensions from Time one were correlated with those of Time two, the correlations were not particularly high (range of .44-.59) (see Table 6). Thus, the ASQ did not have good test-retest reliability.

Insert Table 6 about here

Because of this lack of consistency for Time one and Time two attribution scores, attribution scores taken at time one were used when life stress(1) was used. Similarly, attribution scores taken at time two were used when life stress(2) was used in the remainder of the analyses.

Hypothesis 4 — Attributional Moderation Effects

The first hypothesis concerning attributional style was:

Hyp 4: Attributional style will differentially contribute to the separate relationships between experienced and anticipated life stress and psychophysiological, physical, and depressive dysfunctioning (e.g., the attributional dimensions may have a stronger moderating influence on the life stress-depression relationship than on the life stress-physical relationship).

Experienced Life Stress Interactions

Eighty-one independent regression analyses were computed using all possible separate combinations of positive, negative, and total life stress (Time one and Time two), in conjunction with one of the three attribution variables, and all of the life stress-attribution interactions as the independent variables, to examine their separate effects on each of the three dependent illness variables. Of these analyses, 60 or 74% were significant ($p < .05$) for overall regression effects. Significant overall regression effects (i.e., R-squares) are presented for positive, negative, and total life stress(1) and positive, negative, and total life stress(2) in Tables 7 and 8, respectively. (Whenever positive life stress was used, only attributions concerning the positive events on the ASQ were used to test moderation effects. Similarly, only attributions concerning negative events on the ASQ were used when negative life stress was used.)

Insert Tables 7 and 8 about here

In addition, of these significant general regression effects, seven had significant interaction terms. Significant interactions were found between the following: negative life stress(1) and stability in predicting the LPIS(1) (F (1, 301) = 4.91, p < .05); negative life stress(1) and stability in predicting the SIRS(2) (F (1, 301) = 6.59, p < .05); total life stress(1) and stability in predicting the SIRS(2) (F (1, 301) = 6.14, p < .05); total life stress(1) and stability in predicting the LPIS(1) (F (1, 301) = 5.10, p < .05); total life stress(1) and stability in predicting the SIRS(1) (F (1, 301) = 5.02, p < .05); total life stress and globality in predicting the LPIS(1). (F (1, 301) = 4.14, p < .05); and positive life stress(2) and stability in predicting the SIRS(2) (F (1, 301) = 3.98, p < .05). Table 9 summarizes these moderational effects of attributional style. Hypothesis 4 was partially supported in that stability moderated life stress-illness relationships. In addition, stability did differentially moderate relationships in that it only moderated LPIS and SIRS relationships.

Insert Table 9 about here

Anticipated Stress

Forty-five independent regression analyses were computed using all possible separate combinations of positive, negative, total, or

relative anticipated stress or stress anticipation, one of the three attribution variables, and all of the anticipated life stress-attribution interactions as the independent variables. The analyses examined the separate effects of the combinations of these independent variables on each of the dependent illness(2) variables. Of these analyses, 28 or 62% were significant ($p < .05$) for overall regression effects. Table 10 shows these significant overall regression effects (i.e., R-squares).

Insert Table 10 about here

Of these significant general regression effects, one interaction term was significant. This interaction term was between negative anticipated stress and stability in predicting the SIRS (F (1, 301) = 20.47, $p < .01$). See Table 9 for this moderation effect. Once again, only stability moderated life stress-illness relationships, thus, partially supporting Hypothesis 4 (although not as strongly with anticipated stress as with experienced stress).

Life Stress-Attribution Relationships

Correlations were computed between experienced and anticipated life stress and the attributional variables from each time period. Sixty-one percent of the correlations were significant. Table 11 presents these correlations. Attributions of globality and stability were directly related to life stress. Internality was not related to life stress. Whether or not individuals blamed themselves was not related directly to life stress.

Insert Table 11 about here

Attribution-Illness Relationships

Pearson product-moment correlations were also computed between the attributional variables and the illness variables for both time periods. Of a possible 108 correlations, 49 or 45% were significant. See Table 12 for a summary of these correlations. Globality was directly related to illness. Individuals who saw the causes of stress as affecting many areas of their lives had more illness symptoms.

Insert Table 12 about here

Hypothesis 5 — Uncontrollable Versus Controllable Life Stress and Attributional Style

A second hypothesis concerning the moderational effects of attributional style was Hypothesis 5.

Hyp 5: Attributional style will influence the relationship between uncontrollable, negative life stress and illness.

One hundred and eight independent regression analyses were computed using all possible combinations of uncontrollable positive or negative life stress or controllable positive or negative life stress, one of the three attribution variables, and all of the uncontrollable/controllable life stress-attribution interactions as the independent

variables. The analyses studied the effects of combinations of these independent variables on each of the three independent illness variables. Sixty or 56% of these analyses had significant overall regression effects: 100% for uncontrollable negative, 89% for controllable negative, 7% for uncontrollable positive, and 26% for controllable positive life stress. Significant overall regression effects (i.e., R-squares) are presented for uncontrollable positive and negative life stress, and for controllable positive and negative life stress, respectively, in Tables 13 and 14. One should note that uncontrollable and controllable negative life stress when combined with attributional style did account for a significant (although small) amount of the illness variance.

Insert Tables 13 and 14 about here

Four of the interaction terms from these regression analyses were significant. The significant interaction terms were as follows: uncontrollable negative life stress(1) and stability(1) in predicting BDI(1) ($\underline{F}$ (1, 301) = 4.73, $\underline{p}$ < .05); uncontrollable negative life stress(1) and internality(1) in predicting LPIS(2) ($\underline{F}$ (1, 301) = 5.17, $\underline{p}$ < .05) and BDI(2) ($\underline{F}$ (1, 301) = 8.07, $\underline{p}$ < .05); and controllable negative life stress(1) and stability(1) in predicting SIRS(2) ($\underline{F}$ (1, 301) = 3.88, $\underline{p}$ < .05). See Table 15 for a summary of these moderating effects. These results did not support Hypothesis 5. The results could have likely been due to chance and did not show

that attributional style moderated the relationship between uncontrollable negative life stress and illness.

Insert Table 15 about here

In general, Hypothesis 4 was partially supported in that stability moderated the relationship between life stress and psychophysiological and physical functioning. Hypothesis 5 was not supported. Regardless of control, negative life stress combined with attributional style did account for a significant amount of illness variance.

Another possible moderational variable, perceptions of control, was investigated. Two hypotheses were considered.

Perceptions of Control

Hypothesis 6 — Moderation Effects

The first perceptions of control hypothesis considered was Hypothesis 6.

Hyp 6: Perceptions of control will moderate the relationship between life stress and various illness behaviors.

Experienced Life Stress Interactions

Fifty-four independent regression analyses were computed using all possible separate combinations of positive, negative, or total life stress (Time one or two), average perceptions of control of experienced (from the LES) or hypothetical (from the ASQ) events, and all of the life stress-perceptions of control interactions as the

independent variables. The analyses examined the separate effects of combinations of these independent variables on each of the dependent illness variables. Of these analyses, 45 or 83% were significant ($p < .05$) in overall regression effects. Thus, perceptions of control in combination with life stress predicted a significant amount of the illness variance. Overall regression effects are presented in Table 16.

Insert Table 16 about here

In addition, of these significant general regression effects, eight had significant interaction terms. Significant interactions were as follows: negative life stress(1) and control(hypothetical events) in predicting the SIRS(2) (F (1, 301) = 5.61, $p < .05$); positive life stress(1) and control(hypothetical events) in predicting the SIRS(2) (F (1, 301) = 4.67, $p < .05$); total life stress(1) and control(experienced events) in predicting the SIRS(2) (F (1, 301) = 4.38, $p < .05$); positive life stress(2) and control(experienced events) in predicting the BDI(2) (F (1, 301) = 8.24, $p < .01$) and the LPIS(2) (F (1, 301) = 4.57, $p < .05$); negative life stress(2) and control(experienced events) in predicting the LPIS(2) (F (1, 301) = 4.89, $p < .05$); and total life stress(2) and control(experienced events) in predicting the BDI(2) (F (1, 301) = 16.19, $p < .01$) and the LPIS(2) (F (1, 301) = 15.06, $p < .01$). See Table 17 for a summary of the moderating effects of perceptions of control. These results showed some support for Hypothesis 6. Both experienced and hypothetical perceptions of control

moderated experienced life stress-illness relations, but not consistently.

Insert Table 17 about here

Anticipated Life Stress Interactions

Forty-five independent regression analyses were computed using all possible separate combinations of the following independent variables as predictors: positive, negative, total, or relative anticipated stress or stress anticipation, average perceptions of control of experienced (from the LES), hypothetical (from the ASQ), or anticipated (from the anticipated stress measure) events, and all of the anticipated life stress-perceptions of control interactions. These analyses examined the separate effects of combinations of these independent variables on each of the dependent illness variables. Of these analyses, 27 or 60% were significant ($p < .05$) in overall regression effects. Anticipated stress in combination with perceptions of control did not account for the illness variables as consistently as experienced life stress in combination with perceptions of control. Overall regression effects are presented in Table 18.

Insert Table 18 about here

In addition, of these significant general regression effects, one had a significant interaction term. The significant interaction was as follows: positive anticipated life stress and experienced perceptions

of control in predicting the SIRS(2) (F (1, 301) = 5.08, $p < .05$). (See Table 17.) Perceptions of control did not moderate the relationship between anticipated life stress and illness. Hypothesis 6 was not supported for anticipated stress. Specific Pearson product-moment correlations were also investigated.

Life Stress-Perceptions of Control Intercorrelations

Intercorrelations between life stress and perceptions of control, both experienced and hypothetical, were computed. Six significant correlations were discovered. In general, the more life stress people experienced, the more control they perceived they had. Table 19 presents these correlations.

Insert Table 19 about here

Perceptions of Control-Illness Intercorrelations

Of a total of 72 Pearson product-moment correlations computed between perceptions of control, of both experienced and hypothetical events, and the illness measures, 12 or 17% were significant. Perceptions of control were not as consistently or strongly directly related to illness as attributional style was. See Table 20.

Insert Table 20 about here

Hypothesis 7 — Uncontrollable Versus Controllable Life Stress

The second perception of control hypothesis concerned uncontrollable life stress.

Hyp 7: The relationship between life events that are seen as uncontrollable and later illnesses will be stronger than the relationship between life events that are seen as controllable and later illnesses.

Pearson product-moment correlations were computed between uncontrollable and controllable negative or positive life stress and the three illness variables. Of a possible 48 correlations, 24 or 50% were significant — 12 for uncontrollable negative, 11 for controllable negative, zero for uncontrollable positive, and one for controllable positive life stress. As one can see, negative life stress, regardless of controllability, was related to illness more than positive life stress. See Table 21 for a summary of these correlations.

Insert Table 21 about here

Pairwise *t*-tests were computed for pairs of correlations of uncontrollable negative or positive life stress and illness, and controllable negative or positive life stress and illness for both time periods. Eighteen separate t-tests were calculated and of those four or 22% were significant at the .05 level: uncontrollable negative life stress(1)-BDI(1) and controllable negative life stress(1)-BDI(1) (t (302) = 1.65, $p < .05$); uncontrollable negative life stress(1)-

LPIS(1) and controllable negative life stress(1)-LPIS(1) (t (302) = 2.50, $p < .01$); uncontrollable negative life stress(2)-BDI(2) and controllable negative life stress(2)-BDI(2) (t (302) = 2.94, $p < .01$); and uncontrollable negative life stress(2)-LPIS(2) and controllable negative life stress(2)-LPIS(2) (t (302) = 3.35, $p < .01$). Table 20 presents all of the correlations between uncontrollable/controllable life stress and the three illness variables.

Controllability did seem to be an important factor in regards to negative life stress. Hypothesis 7 was partially supported for negative life stress, but not for positive life stress.

In general, when negative life stress was seen as uncontrollable, it predicted illness better than when it was seen as controllable. Experienced perceptions of control themselves partially moderated the life stress-illness relationship, but did not directly predict illness.

Another moderator variable that was investigated was social support. Amount of, satisfaction with, availability of, frequency of, and type of social support were considered.

Social Support

The Comprehensive Social Support Measure (CSSM) was developed specifically for this study. Table 22 presents average amounts of, satisfaction with, and availability of social support provided by parents, siblings, friends, other relatives, and others. Note that subjects rated parents and other relatives higher in amount and satis-

faction with support, whereas friends and parents were more available. In addition, subjects differentially used these supports in that 60% of the support came from friends, 20% from parents, 12% from siblings, 5% from relatives, and 3% from others.

Insert Table 22 about here

Hypothesis 8 — Stability of Social Support Interactions

One hypothesis presented concerned stable social support.

Hyp 8: Social support will moderate the relationship between life events and illness in that the relationship will be weak for individuals with high, stable support systems, whereas it will be strong for individuals with low, stable support systems. (This hypothesized pattern implies that high, stable support systems act as a buffer against stress.)

The number of helpers and amount of social support identified in the CSSM and the frequency of support from the ISSB were used to study Hypothesis 8. Social support was considered to be stable for an individual if the difference between the number of helpers, amount of support, or frequency of support between Time one and Time two was less than or equal to 1/2 standard deviation above the mean of this difference for the entire sample. The remainder of the analyses for this hypothesis were computed only with individuals with stable support.

The effects on each of the dependent illness variables from all possible separate combinations of independent variables were studied. Specifically, 81 independent regression analyses were computed using the following independent variables as predictors: positive, negative, or total life stress (Time one and Time two), stable frequency of support, stable number of helpers, or stable amount of support, and all of the life stress-social support interactions. Of these analyses, 59 or 73% were significant ($p < .05$) in overall regression effects. These results suggest that life stress in combination with stable support accounted for a significant amount of the illness variance. Significant overall regression effects are presented for frequency of support, number of helpers, and amount of support, respectively, in Tables 23, 24, and 25.

Insert Tables 23, 24, and 25 about here

Of these significant general regression effects, 17 had significant interaction terms — two for amount of support, twelve for frequency of support, and three for number of helpers (CSSM). Significant interactions were found between the following: negative life stress(1) and amount of support(1) in predicting the BDI(2) (F (1, 229) = 6.36, $p < .05$) and in predicting the LPIS(2) (F (1, 229) = 4.37, $p < .05$); total life stress(1) and ISSB(1) (F (1, 233) = 4.62, $p < .05$) in predicting the BDI(1); total life stress(1) and ISSB(1) in predicting the LPIS(1) (F (1, 233) = 4.45, $p < .05$); negative life stress(1) and ISSB(1) (F (1, 233) = 5.49, $p < .05$) and total life stress(1)

and ISSB(1) (F (1, 233) = 6.09, p < .05) in predicting the BDI(2); positive life stress(2) and ISSB(2) in predicting the LPIS(2) (F (1, 233) = 3.88, p < .05) and the SIRS(2) (F (1, 233) = 9.32, p < .01); negative life stress(2) and ISSB(2) in predicting the BDI(2) (F (1, 233) = 9.23, p < .01), LPIS(2) (F (1, 233) = 5.78, p < .05), and SIRS(2) (F (1, 233) = 6.68, p < .05); total life stress(2) and ISSB(2) in predicting the BDI(2) (F (1, 233) = 6.69, p < .01), the LPIS(2) (F (1, 233) = 5.94, p < .05), and the SIRS(2) (F (1, 233) = 10.32, p < .01); positive life stress(1) and number of helpers(1) in predicting the BDI(1) (F (1, 238) = 4.09, p < .05); and total life stress(1) and number of helpers(1) in predicting the BDI(1) (F (1, 238) = 4.14, p < .05) and LPIS(2) (F (1, 238) = 3.98, p < .05). Tables 26 and 27 present the moderation effects for frequency of support and number of helpers/amount of support, respectively. These results suggest that Hypothesis 8 was not supported. Although stable frequency of support moderated the life stress-illness relationship and stable amount of support and stable number of helpers did not, the direction of the moderation suggested in Hypothesis 8 was not supported. Less frequent social support buffered the effects of stress. Satisfaction with support was another important variable.

Insert Tables 26 and 27 about here

Hypothesis 9 — Satisfaction with Support

Hypothesis 9 concerned how satisfied subjects were with their support.

Hyp 9: The relationship between life stress and illness will be stronger for those individuals who are less satisfied with the general support they receive than for those who are more satisfied.

Satisfaction with Support Interactions

Twenty-seven independent regression analyses were computed using all possible separate combinations of positive, negative, or total life stress (Time one and Time two), satisfaction with support (from the CSSM), and all of the life stress-satisfaction with support interactions as the independent variables. These analyses examined the separate effects of combinations of these independent variables on each of the three dependent illness variables. Of these analyses, 24 or 89% had significant overall regression effects. Table 28 summarizes these R-square values. Satisfaction with support combined with life stress accounted for a significant, although small amount of the illness variance.

Insert Table 28 about here

Of these significant independent regression effects, two had significant interaction terms: negative life stress(1) and satisfaction with support(1) in predicting the LPIS(1) (F (1, 301) = 5.34, $p < .05$),

and negative life stress(2) and satisfaction with support(2) in predicting the SIRS(2) (F (1, 301) = 3.96, $p < .05$). See the bottom of Table 27 for these moderation effects.

Hypothesis 9 was not supported by the present data. Satisfaction with support did not moderate the relationship between life stress and illness. More information can be obtained by looking at the interrelationships between the social support measures.

Relationships between Frequency of, Amount of, Availability of, and Satisfaction with Support

Forty-five Pearson product-moment correlations were computed between frequency of support (ISSB), amount of support, satisfaction with support, availability of support, and number of helpers (CSSM) for Time one and Time two. Of these, 28 or 62% were significant. Table 29 summarizes these intercorrelations.

Insert Table 29 about here

Amount of support was more related to satisfaction with than frequency of support. Frequency and amount of support were significantly, although not highly related. Number of helpers was not related to any other support.

In addition to amount of, satisfaction with, and frequency of social support, types of social support were considered. Six types of support were used to investigate Hypothesis 10.

Hypothesis 10 — Types of Social Support

Hyp 10: The buffering effect of social support will vary depending on the type of support received.

Types of Social Support Interactions

One hundred and sixty-two independent regression analyses were computed using all possible separate combinations of positive, negative, or total life stress (Time one and Time two), one of the six types of support from the SPS, and all of the life stress-types of support interactions as the independent variables. These analyses examined the separate effects of combinations of these independent variables on each of the three dependent illness variables. Of these analyses, 150 or 93% were significant in overall regression effects. Significant overall regression effects (i.e., R-squares) are presented for positive, negative, and total life stress Time one and Time two, respectively, in Tables 30 and 31. Life stress in combination with one of the six types of support accounted for a significant amount of the illness variance consistently.

Insert Tables 30 and 31 about here

Of these significant regression effects, 22 or 23% had significant interaction terms. The following were significant: in predicting the BDI(1) - negative life stress(1) and opportunity for nurturance(1) (F (1, 301) = 5.02, $p < .05$); in predicting the LPIS(1) - negative life stress(1) and attachment(1) (F (1, 301) = 4.54, $p < .05$), negative life

stress(1) and social integration(1) (F (1, 301) = 6.42, p < .05), negative life stress and reassurance of worth(1) (F (1, 301) = 6.82, p < .01), negative life stress(1) and reliable alliance(1) (F (1, 301) = 5.05, p < .05), negative life stress(1) and opportunity for nurturance(1) (F (1, 301) = 14.14, p < .01), and total life stress(1) and opportunity for nurturance(1) (F (1, 301) = 6.71, p < .05; in predicting the SIRS(1)- negative life stress(1) and social integration(1) (F (1, 301) = 4.34, p < .05), total life stress(1) and social integration(1) (F (1, 301) = 4.46, p < .05), negative life stress(1) and reassurance of worth(1) (F (1, 301) = 6.76, p < .05), total life stress(1) and reassurance of worth(1) (F (1, 301) = 7.33, p < .01), negative life stress(1) and reliable alliance(1) (F (1, 301) = 4.36, p < .05), negative life stress(1) and opportunity for nurturance(1) (F (1, 301) = 4.17, p < .05), and total life stress(1) and opportunity for nurturance(1) (F (1, 301) = 5.80, p < .05); in predicting the SIRS(2) - negative life stress(1) and social integration(1) (F (1, 301) = 6.12, p < .05), reassurance of worth(1) (F (1, 301) = 9.04, p < .01), reliable alliance(1) (F (1, 301) = 8.18, p < .01), or opportunity for nurturance(1) (F (1, 301) = 10.31, p < .01), and total life stress(1) and reassurance of worth(1) (F (1, 301) = 5.26, p < .05) or opportunity for nurturance(1) (F (1, 301) = 7.31, p < .05); and in predicting the LPIS(2) - negative life stress(1) and opportunity for nurturance(1) (F (1, 301) = 6.23, p < .05) and total life stress(1) and opportunity for nurturance(1) (F (1, 301) = 4.18, p < .05). Table 32 presents these moderation effects.

Insert Table 32 about here

Some support was found for Hypothesis 10, although the results could have been due to chance. Low levels of opportunity for nurturance and reassurance of worth seemed to buffer the effects of stress to a point.

The relationships between the types of social support and other variables were analyzed. The next four sections cover these analyses.

Intercorrelations between the Different Measures of Social Support

Correlations between types of support and frequency of, satisfaction with, availability of, and amount of support (Time one and Time two) were calculated. One hundred and two or 85% were significant. That is, as subjects experienced more support, they experienced more of the types of support. See Table 33.

Insert Table 33 about here

Intercorrelations between the Types of Social Support

One hundred percent of the intercorrelations between types of support from the SPS were significant. As individuals experienced one type of support, they were more likely to experience other types. Guidance was particularly related to reliable alliance and attachment. Table 34 summarizes these correlations.

Insert Table 34 about here

Correlations between Life Stress and Measures of Social Support

Of a possible 132 correlations between positive, negative, or total life stress and the measures of types of, amount of, frequency of, availability of, and satisfaction with social support, 32 or 24% were significant. As individuals experienced more types of social support, they experienced more positive and less negative life stress. See Table 35.

Insert Table 35 about here

Correlations between Illness and the Measures of Social Support

Finally, the various measures of social support were correlated with the three illness variables for Time one and Time two. Sixty-one or 46% of the correlations were significant. As individuals experienced more types of social support, they experienced less depressive or psychophysiological symptoms. Table 36 summarizes these correlations.

Insert Table 36 about here

Six types of support were noted above. This study also looked at subjects' own perceptions of appropriate support.

Hypothesis 11 — Appropriate Social Support

Subjects' own perceptions of social support were considered by Hypothesis 11.

Hyp 11: Subjects who receive appropriate (i.e., helpful as defined by the subject) social support for dealing with their most stressful experience will show less psychological and physical dysfunctioning (i.e., a stronger buffering effect) than those who receive less appropriate support.

In order to test Hypothesis 11, subjects filled out the ISSB items according to how helpful each type of support would be for dealing with the most stressful event they experienced and how frequently they actually received each type of support from an individual they identified as being most helpful in dealing with this stressful event. Difference scores were computed for each subject using ratings of appropriateness of support minus ratings of frequency of actual support received. The sums of the absolute values of these difference scores were used as the moderator variable in the following analyses.

Eighteen independent regression analyses were computed using positive, negative, or total life stress(1), the sum of the difference scores, and the life stress-difference score interactions as the independent variables to study their effects on the three dependent illness variables (Time one and Time two). Of these analyses, 13 or 72% were significant ($p < .05$) in overall regression effects. Table 37 presents the overall regression effects.

Insert Table 37 about here

Five of these analyses had significant interaction terms: negative life stress(1) and difference scores in predicting the LPIS(1) (F (1, 301) = 15.90, p < .01), the BDI(1) (F (1, 301) = 14.46, p < .01), and the LPIS(2) (F (1, 301) = 4.11, p < .05); and total life stress(1) and difference scores in predicting the LPIS(1) (F (1, 301) = 8.18, p < .01) and the BDI(1) (F (1, 301) = 8.66, p < .01). See Table 38 for a summary of these moderation effects.

Insert Table 38 about here

Hypothesis 11 was not supported. Instead, for individuals who received little appropriate support or much less appropriate support, life stress was less related to illness (i.e., stress was buffered). Further analyses were too complex for this study.

In general, life stress in combination with social support accounted for a significant, although small amount of the illness variance. Hypothesis 10 was partially supported because opportunity for nurturance moderated the relationship between life stress and illness. Opposite to that suggested in Hypothesis 8, less frequent stable support buffered the effects of stress.

The final hypothesis investigated incorporated a variety of moderator variables. The moderational effects of combining social support and attributional style were investigated.

Hypothesis 12 — Interactions between Attributions and Social Support as Moderators

Hypothesis 12 focused on the interaction between attributions and social support.

Hyp 12: The impact of social support on the life stress-illness relationship will differ for individuals with different attributional styles.

One hundred and eight independent regression analyses were computed using positive, negative, and total life stress (Time one and Time two), attributional style/hypothetical perception of control, frequency of social support, and life stress-attribution-social support interactions as independent variables to examine their effects on the three dependent illness variables. (Only frequency of support from the ISSB was used in these analyses because it had been one of the few social support measures that moderated the life stress-illness relationship in previous analyses. In addition, perception of control of hypothetical events was included in the attribution analyses because it was from the same instrument as the other attribution dimensions.) Of these analyses, 92 or 85% had significant overall regression effects. These results suggested that life stress combined with attributional style and social support accounted for a significant amount of the variance in illness variables. Table 39 presents the R-square values for these regression effects.

Insert Table 39 about here

Of these significant regression effects, 17 or 21% had a significant interaction term. The significant interactions were as follows: in predicting the BDI(1) - positive life stress(1), internality(1), and ISSB(1) (F (1, 297) = 5.14, p < .05); in predicting the LPIS(1) - negative life stress(1), stability(1), and ISSB(1) (F (1, 297) = 4.73, p < .05); in predicting the LPIS(2) - positive life stress(1), internality(1), and ISSB(1) (F (1, 297) = 4.22, p < .05), positive life stress(1), controllability(1), and ISSB(1) (F (1, 297) = 5.53, p < .05), and positive life stress(2), stability(2), and ISSB(2) (F (1, 297) = 5.71, p < .05); in predicting the BDI(2) - negative life stress(1), globality(1), and ISSB(1) (F (1, 297) = 7.66, p < .01), positive life stress(1), internality(1), and ISSB(1) (F (1, 297) = 7.44, p < .01), positive life stress(1), controllability(1), and ISSB(1) (F (1, 297) = 6.96, p < .01), positive life stress(2), controllability(2), and ISSB(2) (F (1, 297) = 4.13, p < .05), positive life stress(2), stability(2), and ISSB(2) (F (1, 297) = 8.04, p < .01), total life stress(2), internality(2), and ISSB(2) (F (1, 297) = 4.17, p < .05), and negative life stress(2), stability(2), and ISSB(2) (F (1, 297) = 4.83, p < .05); and in predicting SIRS(2) - positive life stress(1), internality(1), and ISSB(1) (F (1, 297) = 9.12, p < .01), positive life stress(1), controllability(1), and ISSB(1) (F (1, 297) = 6.95, p < .01), negative life stress(2), internality(2), and ISSB(2) (F (1, 297) = 7.90, p < .01), negative life stress(2), globality(2), and ISSB(2) (F (1, 297) = 9.08, p < .01), and total life stress(2), globality(2), and ISSB(2) (F (1, 297) = 3.98, p < .05). See Table 40 for a summary of these attributional style-social support interactions.

In general, for individuals with internal and/or global attributions for negative stress and for individuals with external, unstable, and/or uncontrollable attributions for positive stress, increases in social support led to high life stress-illness correlations. Hypothesis 12 was partially supported. The final sections will deal with factors influencing responses and comments on the overall study.

Insert Table 40 about here

Factors Influencing Responses

A number of specific factors were analyzed to discover their impact on subjects' responses. First, however, descriptive statistics are presented in Table 41 for all variables. See this table for a summary of mean scores.

Insert Table 41 about here

Social Desirability

Social desirability (as measured by the MCSDS) was correlated with measures of illness, life stress (experienced and anticipated), attributional style, and social support. Each of these is discussed separately.

Illness Variables

Social desirability was correlated with the three illness variables measured at Time one and Time two. Five of the six correlations were significant: BDI(1) (r = -.21, p < .01); BDI(2) (r = -.11, p < .05); LPIS(1) (r = -.18, p < .01); SIRS(1) (r = -.24, p < .01); and SIRS(2) (r = -.21, p < .01). Note that all of the correlations were negative. See Table 1 for a summary.

Experienced Life Stress

Life stress (Times one and two) was also correlated with the MCSDS. Of 12 correlations, only four were significant: negative life stress (1 — 0-6 months) (r = -.19, p < .01); total life stress (1 — 0-6 months) (r = -.13, p < .05); negative life stress(1) (r = -.18, p < .01); and negative life stress(2) (r = -.12, p < .05). Table 2 summarizes these correlations.

Anticipated Life Stress

Three of the 11 correlations between anticipated stress and social desirability were significant: negative anticipated stress(1) (r = -.12, p < .01), number of anticipated events(1) (r = -.12, p < .05), and number of anticipated events(2 — those that actually occurred) (r = .16, p < .01). See Table 5 for a summary.

Social Support

Measures of type, amount, satisfaction with, and frequency of social support were also correlated with the MCSDS. Of 22 possible correlations, four were significant: reassurance of worth(1) (r = .21,

$p < .01$); reassurance of worth(2) ($r = .15$, $p < .01$); opportunity for nurturance(2) ($r = .13$, $p < .05$); and satisfaction with support(1) ($r = .14$, $p < .01$). See Table 33.

Attributional Style

Finally, social desirability was correlated with attributional style. Five of the 18 correlations were significant: stability (positive — Time 1) ($r = .17$, $p < .01$), stability (negative — Time 1) ($r = -.26$, $p < .01$), globality (negative — Time 1) ($r = -.20$, $p < .01$), globality (total — Time 1) ($r = -.12$, $p < .05$), and stability (negative — Time 2) ($r = .14$, $p < .05$). See Table 12 for a summary of these correlations.

Present Stress Levels

Ratings of the levels of stress subjects felt were in their lives before they completed the inventories were correlated with life stress, anticipated and experienced, the three illness measures, and the MCSDS. Significant correlations were found between the following variables and present stress level: negative life stress(1) ($r = .24$, $p < .01$), negative life stress(2) ($r = .29$, $p < .01$), total life stress(1) ($r = .19$, $p < .01$), total life stress(2) ($r = .23$, $p < .01$), negative anticipated stress(1) ($r = .26$, $p < .01$), negative anticipated stress(2) ($r = .17$, $p < .05$), total anticipated stress(1) ($r = .17$, $p < .05$), total anticipated stress(2) ($r = .15$, $p < .05$), relative anticipated stress(1) ($r = .31$), $p < .01$), relative anticipated stress(2) ($r = .18$, $p < .01$), stress anticipation(1) ($r = .24$, $p < .01$), number of

anticipated events(1) (r = .13, p < .05), number of anticipated events(2) (r = .15, p < .05), BDI(1) (r = .36, p < .01), BDI(2) (r = .37, p < .01), LPIS(1) (r = .32, p < .01), LPIS(2) (r = .33, p < .01), SIRS(1) (r = .21, p < .01), SIRS(2) (r = .18, p < .01), and MCSDS (r = .13, p < .05). In general, how individuals completed inventories may have been influenced by how stressful they perceived their lives to have been at the time they completed the inventories.

Summary of Results

The results indicated strong support for Hypotheses 1 and 2. Life stress-illness relationships varied depending upon the illness behavior that was assessed and negative life stress was more related to illness than was positive life stress. Moderate support was found for Hypotheses 3, 4, 6, 7, 10, and 12. Anticipated stress was related to illness and uncontrollable negative life stress-illness correlations were generally stronger than controllable negative life stress-illness correlations. Attributions of stability, experienced perceptions of control, and opportunity for nurturance moderated the life stress-illness relationships and attributional style had a minimal impact on the moderation of life stress-illness relationships by social support. Little support was indicated for Hypotheses 5, 8, 9, and 11. Attributional style did not moderate the relationship between uncontrollable, negative life stress and illness, nor did satisfaction with support generally moderate life stress-illness relationships. Although stable frequency of support moderated life stress-illness relationships, the results were in the opposite direction of

those proposed in Hypothesis 8. Individuals who received appropriate support did not experience less illness than those who received less appropriate support. Finally, 47% of the calculated correlations between the independent variables and the dependent illness variables were significant. Of the independent variables, life stress was most consistently related to illness.

DISCUSSION

This study addressed 12 specific hypotheses pertaining to life stress-illness relationships. As noted above, the results indicated moderate support for six of the hypotheses, no support for four of them, and strong support for two hypotheses. The findings, implications of findings, and limitations of the study pertinent to each hypothesis will be addressed in the following sections.

Life Stress and Illness Behavior

Hypothesis 1 — Life Stress-Illness Associations

The first hypothesis addressed in this study was:

Hyp 1: The relationship between life stress and illness behavior will vary depending on the domains of functioning and related illness behavior which is assessed.

The different types of life stress correlated significantly with all three illness variables, particularly ratings of physical illness (see Passer & Seese, 1983, and Stern et al., 1982). Depression was second in terms of number of significant correlations, while psychophysiological symptoms ranked third. The size of these correlations were similar to those found in other studies (Cline & Chosey, 1972; Monroe et al., 1983; Rahe et al., 1972; Taverna, 1983).

For the prospective analyses (i.e., Time one and Time two life stress correlated with Time 2 illness), Time one illness was partialled out. Thirteen of the 27 correlations that originally were significant remained significant even after the effects of Time one illness were

removed, particularly for psychophysiological symptoms. All of the relationships between Time two negative and total life stress and illness remained, suggesting that these variables were related independent of illness that was present in the past. Life stress(1) also predicted later psychophysiological functioning independent of earlier functioning. However, when Time one life stress and Time two depressive and physical illness relationships were considered, illness present at Time one seemed to play an important role in predicting illness present at Time two. This may in part have been due to the short time lag between measurements. These findings suggested that researchers may need to remove the effects of earlier illnesses before drawing conclusions about how well life stress itself predicts illness.

Temporal relationships appeared to be important in this study. Negative life stress was related to illness symptoms independent of previous illness only when they occurred close together (e.g., Time two life stress and Time two illness). Negative life stress(1) was not significantly related to illness(2) independent of illness(1). This notion suggested that the independent impact of life stress may have been more immediate than previously thought. In addition, negative and total life stress (Time two) were significantly related to illness (Time one). Although this finding seemed to confuse the direction of the life stress-illness relationship, life stress(2) occurred temporally closer to illness(1) than life stress(1) occurred to illness(2). More specifically, life stress(1) included an entire year of the past and illness(2) was measured seven weeks later. Life stress(2) included this seven-week period which started just after

illness(1) was measured (see Figure 1). Thus, illness(1) and life stress(2) occurred closer together in time than life stress(1) and illness(2). Variables that appeared closer in time would likely correlate higher than those that did not. Causal relationships cannot be inferred from these data.

Hypothesis 1 was supported by the results of this study. As was noted in the next few paragraphs, the magnitude of the relationship between life stress and illness depended upon which type of illness was measured.

Physical Illness and the Seriousness of Illness Rating Scale

The SIRS correlated with all types of life stress more consistently than the other illness measures. Even positive life stress was related to physical illness, although the magnitude of this relationship was much smaller than that between negative or total life stress and the SIRS. The influence of life stress on physical illness(2) was not generally independent of past physical illness(1), suggesting that the impact of life stress may have in part been due to preexisting ailments. However, similar to other studies, life stress was shown to be significantly related to physical illness (Cooley et al., 1979; Kobasa et al., 1982; Stern, McCants, & Pettine, 1982; Taverna, 1983).

The SIRS used in this study was modified to allow students to fill in illnesses they had experienced that were not on the original inventory. This modification was useful because subjects reported illnesses other than the ones contained on the original inventory. Such data would have been omitted had the original inventory been

employed. Thus, a modified version of the SIRS was more relevant with this student population.

Psychological Stress and Psychophysiological Symptoms

As noted earlier, life stress was related to psychophysiological symptoms, as measured by the LPIS, independent of previously existing psychophysiological symptoms. McFarlane et al. (1983) and Cohen, McGowan, Fooskas, and Rose (1984), in prospective studies, also found life stress to be related to psychophysiological symptoms. In the present study, positive life stress was unrelated to the LPIS, whereas negative life stress was related to the LPIS, suggesting that stress must be undesirable before psychophysiological symptoms begin to appear. These findings supported other research which showed undesirable life stress to be related to psychophysiological functioning (Mueller, Edwards, & Yarvis, 1977; Taverna, 1983) and life stress, in general, to be related to psychophysiological symptoms (Crandall & Lehman, 1977; Dohrenwend, 1973; Lehman, 1978).

Life Stress and Depression

Similar to the findings with the LPIS, only negative and total life stress correlated significantly with the BDI (Cohen, McGowan, Fooskas, & Rose, 1984). In this study, stress rated as undesirable had a greater impact on depressive symptomatology than desirable stress. Similar to physical symptoms, life stress did not consistently predict depressive symptoms(2) independent of earlier depressive symptoms(1). Finally, the correlations between life stress and depression ranged from .00 to .52 (median of .25), as had been found by other researchers

(Blaney et al., 1980; Taverna, 1983; Zimmerman et al., 1984).

According to the results noted above, negative and positive life stress appeared to have differential effects. This notion was investigated in Hypothesis 2.

Hypothesis 2 — Negative Versus Positive Life Stress

An additional hypothesis related to life stress and illness was:

Hyp 2: Negative life events will show a stronger relationship to subsequent psychophysiological, physical, or mood dysfunctioning than will positive life events.

In general, negative life stress did correlate with more illness measures than did positive life stress, thus supporting previous research (Mueller et al., 1977; Tausig, 1982). Even when positive life stress significantly correlated with an illness measure, negative life stress always correlated significantly higher with that same measure (e.g., positive and negative life stress(2) correlated with the SIRS(2)).

As noted earlier, people tended to note more depressive and psychophysiological symptoms if they had experienced more negative life stress than if they only experienced positive life stress. This finding supported other research which indicated that a person's perceptions of desirable or undesirable life change had an important impact upon his or her emotional and physical functioning (Monroe, 1982a; Monroe et al., 1983; Tausig, 1982). Also, positive and negative life stress were correlated; thus, individuals who experienced negative life

stress also appeared to experience some positive change.

Thus, the present results suggested that it was important to make a distinction between desirable and undesirable events when life stress was studied. Despite the fact that negative and positive life stress were correlated, each had separate, unique effects upon each of the illness variables. In addition, as suggested by the data related to Hypothesis 3, researchers would be well-advised to distinguish between anticipated and experienced stress.

Hypothesis 3 — Anticipated Stress

The anticipated stress measure used in this study was developed specifically for this study. One can see by the means in Table 3 that, relative to other stressors, the subjects tended to rate events they anticipated under the categories of academics and other (e.g., change of residence, borrowing money, detention in jail) as more stressful than events under the remaining categories. Subjects also anticipated more academic stressful events than other events, which was expected in a college setting. Hypothesis 3 dealt with how anticipated stress was related to other illness.

Hyp 3: Ratings of anticipated life stress (both positive and negative) will be significantly related to later psycho-physiological, physical, and/or mood dysfunctioning.

Anticipated stress measures taken at Time one did correlate significantly, but minimally, with illness present at Time two. Hypothesis 3 was, therefore, supported. Similar to experienced life

stress, negative and total anticipated stress showed stronger correlations with illness than positive anticipated stress did. However, only the relative anticipated stress-SIRS correlation remained significant after the effects of Time one illness and life stress were removed. Only when subjects perceived anticipated stressors as more stressful than past ones, did anticipated stress predict physical illness independent of past illness and life stress. This relationship did not apply to psychophysiological or depressive symptoms. This finding suggested that anticipated stress alone may not have predicted later illnesses. Subjects may have had to actually experience a stressful event before the effects of it were shown in illness behavior.

The concept must also be considered that the anticipated stress measure was developed particularly for this study and as such, may not have been an adequate measure of anticipated stress. The length of time between the measurement of stress anticipation and the occurrence of the anticipated event also may have influenced the impact of anticipated stress on illness. Stressful events that were anticipated to occur in a shorter time period may have seemed more stressful to the individuals than those events that were anticipated to occur much later in time. More stress may have lead to more illness; thus, the relationship between anticipated stress and illness may have been stronger for shorter time periods between the anticipation of an event and the actual occurrence of an event than for longer time periods.

Examination of the relationship between ratings of anticipated stressful events (Time one) and ratings after the actual occurrence

of these events (Time two) suggested that subjects were quite accurate at predicting how stressful events would be for them in the future (i.e., Time one-Time two correlations ranged from .41 for relative anticipated stress to .64 for the number of anticipated events). In addition, anticipated positive and negative stress were correlated; thus, individuals who anticipated stress appeared to anticipate both positive and negative stress. However, subjects tended to anticipate negative stressors more often than positive ones.

In conclusion, the results indicated that life stress was related to illness, negative life stress was more related than positive life stress to illness, and anticipated stress was related to later illness (although not independently of experienced life stress). The impact of life stress may also have been more immediate than previously thought. Certain groups may have experienced more life stress or illness.

Farmer Related Analyses

Investigations were carried out concerning the differences between the experiences of farm and nonfarm families. There were few differences between members of farm families and members of nonfarm families on the social support, life stress, anticipated stress, and illness measures. Members of farm families described themselves as more depressed. This difference may have been due to current economic difficulties. In addition, members of farm families, more than nonfarm family members, tended to believe they had more control over negative

life stress. This cognitive belief may have been a way of coping with the helpless feelings that can occur when one's life depends on uncontrollable entities such as the weather, in addition to the current economic ambiguities associated with market prices and government subsidies. However, more specific research should be conducted in this area.

In order to better understand the life stress-illness relationship, specific aspects of this study's moderator variables will be discussed. The first moderational variable to be discussed will be attributional style.

Attributional Style

Reliability of the ASQ

As noted earlier in the results section, attributional dimensions measured at Time one (from the ASQ, Peterson et al., 1982) did not highly correlate with dimensions measured at Time two. This finding supported Persons and Rao's (1985) suggestion that attributional styles are not necessarily stable and may change over time.

In addition, the internal reliabilities of each of the attributional scales of the ASQ were not very high (ranging from .34 to .65). The internality dimension was particularly unreliable (with coefficient alphas of .34 for Time one and .39 for Time two). Despite the fact that the 12 questions were identical within each attributional dimension, subjects varied their ratings depending upon what event they were considering. This finding suggested that attributional ratings were

heavily influenced by the external situation and were not necessarily individual, stable approaches to appraising the environment or stress. These findings were consistent with Peterson and Seligman (1984) who noted that both the type of event and attributional style may be important.

Analyses were completed using the ASQ to measure attributional style. Two hypotheses were considered concerning the moderational effects of attributional style. The first hypothesis concerned general life stress, whereas the second hypothesis concerned uncontrollable life stress.

Hypothesis 4 — Attributional Moderation Effects

The first hypothesis concerning attributional style was stated as follows:

> Hyp 4: Attributional style will differentially contribute to the separate relationships between experienced and anticipated life stress and psychophysiological, physical, and depressive dysfunctioning (e.g., the attributional dimensions may have a stronger moderating influence on the life stress-depression relationship than on the life stress-physical relationship).

Experienced Life Stress

Significant overall regression effects were found for over 70% of the total analyses performed. Total and negative life stress in combination with each of the attribution dimensions appeared to have a

significant effect on scores on the BDI, LPIS, and SIRS. Combinations of negative or total life stress and attributional styles accounted for a significant amount of the variance of these illness variables. One must note, however, that although these regression effects were statistically significant, they were also very small, with R-square values ranging from .05 to .29. Thus, only 5 to 29% of the variance of illness variables were accounted for by combinations of life stress and attributional style.

Of the 81 independent regression analyses performed, only seven resulted in significant interactions. Thus, these findings could easily have been due to chance. Therefore, in general, these results did not supply substantial evidence that attributional style moderated the relationship between life stress and illness. However, it is important to note that the only attributional dimension that moderated many of the life stress-illness relationships was stability. It was unlikely that this finding was due to chance and consequently, attributions of stability warrant enough attention to be discussed.

Attributions of stability concerned whether a person perceived the causes of a stressful event to always be present (i.e., stable) or to never again be present (i.e., unstable). The general finding in regard to stability as a moderator was that for individuals who tended to attribute stressful events to unstable causes, as life stress increased, so did illness behavior. Attributions of less stability had the unique contribution of increasing the predictive relationship between life stress and illness. In other words, whether or not life stress led to illness depended upon how individuals attributed stability

to the causes of stressful events. Attributing stress to stable causes may have made one less vulnerable to the stressor. For individuals with attributions of stability, the causes of their stress were frequently present and probably had affected stress in the past; thus, these causes were somewhat predictable. However, for individuals with attributions of instability, the causes of their stress had likely not been present before; thus, these causes were more unpredictable. This unpredictability could have accounted for the increase in illness symptoms when life stress was experienced by this group. In addition, as life stress increased for individuals with attributions of instability, the causes of this stress must have also increased (i.e., they did not attribute stress to causes of past stress; thus, new and additional causes must have been attributed for new stresses). This increase in the number of causes of stress individuals with attributions of instability believed they had, may have also accounted for the increased illness symptomatology when stress was experienced.

In addition, stability did not moderate the relationship between any type of life stress and the BDI. If attributional style had an impact on depression, it was not due to a moderating effect on the life stress-depression relationship.

Anticipated Stress

Similar to experienced life stress, over 60% of the overall regression effects were significant for anticipated stress. Once again, total and negative anticipated life stress, in combination with the attributional variables, had significant effects on the three ill-

ness measures. However, only 3 to 10% of the illness variance was accounted for by the combinations of anticipated life stress and attributional dimensions, and only one of the 45 regression analyses had a significant interaction effect. This interaction effect was likely due to chance. As with experienced life stress, only the stability dimension showed any moderating effects, this time between negative life stress and the SIRS. Once again, no moderating effects were found for the anticipated life stress-depression relationship.

In general, Hypothesis 4 was partially supported. Attributional style (e.g., stability) differentially contributed to the life stress-illness relationships. Attributions of stability only moderated life stress-physical and life stress-psychophysiological relationships and not life stress-depression relationships. The stability dimension appeared to be the only attributional style with significant effects on the life stress-illness relationship. Thus, attributional style did not generally moderate life stress-illness relationships.

Life Stress-Attribution Relationships

Analyses were also completed on the relationships between pairs of these variables. Examination of the correlations between life stress and attributional styles seemed to show that the stability and globality dimensions were related to all forms of life stress except for anticipated positive life stress. In other words, people who experienced a great deal of life stress or who anticipated negative life stress tended to view the causes of events as more stable (i.e., as always being present) and more global (i.e., as affecting all areas of their lives) than

those who did not. Whether or not individuals tended to blame themselves (i.e., internality) did not seem to be consistently related to life stress.

Attribution-Illness Relationships

Correlations between the attributional styles and the various illness variables showed that the globality dimension was most consistently related to the illness measures — twice that of the other dimensions. The general finding was that individuals who tended to view the causes of negative or negative and positive (total) events as affecting many areas of their lives (i.e., global), also showed more depressive, psychophysiological, and physical symptoms. Cochran and Hammen (1985) also found this relationship between globality and depression.

Another consistent finding in the data was that individuals who tended to view the causes of negative events as due to themselves (i.e., internal) showed more depressive symptoms. This finding and the globality results noted above support the reformulated learned helplessness hypothesis (RLHH). This hypothesis states that depressed individuals are likely to attribute causes of negative events to internal, stable, and global causes (Abramson et al., 1978). Other results that supported the RLHH were as follows. Individuals who tended to see the causes of negative events as stable also tended to show more symptoms of depression, although this finding was not as consistent as the others. There was also a pattern that suggested that individuals who viewed the causes of positive events as due to themselves (i.e., internal)

and as being stable had less depressive, psychophysiological, and physical symptoms. Although this pattern was not statistically significant, it still supported the direction of the results suggested by the RLHH, and in combination with the globality results noted above extended the hypothesis to symptoms other than depression. Moderational analyses were also performed based on the RLHH.

Hypothesis 5 — Uncontrollable Versus Controllable Life Stress and Attributional Style

Hypothesis 5 was another attributional hypothesis that was considered and that concerned uncontrollable events.

Hyp 5: Attributional style will influence the relationship between uncontrollable, negative life stress and illness.

According to the RLHH (Abramson et al., 1978), if an individual experienced an uncontrollable, negative event and attributed the cause of this event to factors that were internal, stable, and global, then depression was more likely to result. Twenty-seven overall regression analyses were computed for combinations of negative, uncontrollable life stress and the three attributional dimensions. All of these analyses were significant, suggesting that combinations of uncontrollable negative life stress and attributional style did account for a significant amount of the variance with R-square values of .03 to .19) of the three illness variables. However, similar findings (although less frequent and accounting for less illness variance) were discovered with controllable, negative life stress. This finding

did not emerge with uncontrollable or controllable positive life stress. Thus, negative life stress, regardless of whether it was uncontrollable or controllable, when combined with attributional style, explained a significant amount of the variance of the illness variables, whereas positive life stress did not. Controllability itself may not have been as important as previously thought.

Attributional style did not generally moderate the relation between uncontrollable or controllable life stress and illness. Out of 108 regression analyses, only four had significant interaction effects that represented moderation effects. These effects were likely due to chance. In general, the relationship between uncontrollable and controllable life stress, attributional style, and illness behavior did not appear to be one of moderation. The vulnerability hypothesis and Hypothesis 5 were not supported in regards to the impact of attributional style on uncontrollable life stress.

Summary of Attributional Style

The data of this study suggested that the vulnerability hypothesis, which states that certain social situations or personal dispositions may moderate the impact of stressful life events on illness (Dohrenwend et al., 1984), was not supported for most of the attributional dimensions. Although attributional style was related to differences in physical, depressive, and psychophysiological symptoms, attributional style in general did not moderate the relationship between life stress and illness. In addition, attributional style

was not a stable factor. Attributions actually changed over time and relied heavily on the specific event and not just the desirability of the event. The stability dimension stood out as the only dimension to show any consistent moderational effects. Individuals who attributed the causes of stress to unstable factors experienced more physical and psychophysiological symptoms than those who attributed causes to stable factors.

Analyses that were based on the RLHH were completed. Some support for the RLHH was found through direct correlations. The globality dimension was found to be more consistently related to the illness measures than were the other dimensions. Attributions of global causes for stress led to more depressive (in accordance with the RLHH), psychophysiological, and physical symptoms. This finding supported the findings of Cochran and Hammen (1985) and extended the RLHH, in regards to globality, to physical and psychophysiological symptoms as well as depression. In addition, those who had more internal or stable attributions for negative events showed more depression.

Uncontrollable, negative life stress in combination with attributional style accounted for a significant, although small amount of the variance in the illness measures. This result was stronger for uncontrollable negative life stress than for controllable negative or uncontrollable/controllable positive life stress. Thus, perceptions of the controllability of life events appeared to be an important factor in determining illness behavior, although not as important as negative stress itself. This factor was studied in more detail in the next section.

Perceptions of Control

Two hypotheses were developed concerning perceptions of control. Each will be discussed separately.

Hypothesis 6 — Moderation Effects

The first perceptions of control hypothesis was Hypothesis 6.

Hyp 6: Perceptions of control will moderate the relationship between life stress and various illness behaviors.

Perceptions of Control Interactions

Over 80% of the regression analyses completed with perceptions of control and experienced life stress had significant overall regression effects. Sixty percent of the regression analyses completed with perceptions of control and anticipated stress, combined with hypothesized and experienced perceptions of control, accounted for a significant portion of the illness variance. More specifically, combinations of life stress and perceptions of control accounted for 3 to 27% of the illness variance. (One should note that 73% of the variance was still unaccounted for.) All three of the illness measures were affected.

Once again, overall negative and total life stress seemed to have the most regression effects compared to positive life stress. Whether or not the perceptions of control were measured in terms of hypothetical events (e.g., the ASQ) or events the subjects actually experienced (e.g., the LES) did not seem to significantly matter for overall regression effects. These effects were quite similar for both types of events.

In addressing the question of whether or not perceptions of control moderated the relationship between life stress and illness, only 8 of the 54 regression analyses had significant interaction terms. This finding showed some support for the moderational effects of perceptions of control (Hypothesis 6) and the vulnerability hypothesis.

Average perceptions of control subjects believed they had over events they actually experienced seemed to have a greater moderational impact on the life stress-illness relationship than perceptions of control of hypothetical events. In all of the significant cases (a total of six), for individuals who believed they had a lower amount of control over the stressful event, higher amounts of life stress were associated with higher amounts of physical, psychophysiological, and depressive symptoms. This result was stronger for individuals who believed they had less control than for individuals who believed they had more control.

One problem with the interpretation of this finding was that experienced perceptions of control were confounded with the actual controllability of an event (i.e., some events were out of anyone's control). People who perceived they had less control over their experienced events may have actually experienced less controllable events. Thus, this moderational impact of control may not have been simply due to the individuals' perceptions of control, but the actual controllability of events. Dispositional perceptions of control (of hypothetical events) showed fewer moderational effects. Thus, perceptions of control, similar to attributional styles, relied heavily on the

specific event considered. Perceptions of control were also directly related to life stress and illness.

Life Stress-Perceptions of Control Relationships

Correlations between life stress and perceptions of control showed that in 50% of the cases, life stress was related to both hypothetical and experienced perceptions of control. In other words, people who experienced a great deal of life stress tended to see these events (or a group of hypothetical events) as more under their control than people who experienced fewer events. One possible way for people to deal with a large amount of stress would be to believe that they had more control; thus, they may believe they could prevent future stress.

Perception of Control-Illness Relationships

Examination of the correlations between perceptions of control and illness indicated that these two variables were not consistently significantly related. Perceptions of control of experienced events seemed to be more related to illness than those of hypothetical events. Of the few significant correlations, the tendency was for people who perceived they had less control to have had more illness symptoms.

The above correlations dealt with perceptions of control in a moderational sense. Hypothesis 7 dealt with perceptions of control of life stress and their direct relation to illness.

Hypothesis 7 — Uncontrollable Versus Controllable Life Stress

Hyp 7: The relationship between life events that are seen as uncontrollable and later illnesses will be stronger than the relationship between life events that are seen as controllable and later illnesses.

As noted in Table 21, uncontrollable and controllable negative life stress were significantly related to the three illness measures. Generally, uncontrollable negative life stress-illness correlations were higher than controllable negative life stress-illness relations, although in only four of the nine *t*-test comparisons of controllable versus uncontrollable negative life stress-illness correlations were these differences significant. These significant *t*-test differences between uncontrollable and controllable negative life stress correlations were also found only when correlations were with the BDI and LPIS, but not with the SIRS. This finding suggested that whether or not negative life stress was seen as controllable made a difference in whether or not life stress predicted psychophysiological or depressive symptoms, but not physical symptoms. People who experienced uncontrollable negative life stress were more likely to experience depression and psychophysiological symptoms than those who experienced controllable negative life stress (consistent with the RLHH). This finding was similar to the results of Husaini and Neff (1980) and McFarlane et al. (1980). In addition, no significant differences were found between uncontrollable positive life stress-illness

correlations and controllable positive life stress-illness correlations. Thus, Hypothesis 7 was partially supported in regards to negative life stress, but not positive life stress.

Summary of Perceptions of Control

Perceptions of control did not consistently moderate life stress-illness relationships. For the moderational effects that were significant, however, individuals who believed they had little control over stressful events were more likely to experience illness when they experienced life stress than those who believed they had control. Perceptions of control-illness correlations suggested that perceptions of control of hypothetical events did not have a significant direct impact on illness variables. However, when uncontrollability was considered in terms of negative life stress, there was a negative impact on illness symptomatology in that the more uncontrollable, negative life stress an individual experienced, the more depressive and psychophysiological symptoms they experienced (Suls & Mullen, 1981). These uncontrollable negative life stress-illness correlations tended to be stronger than controllable negative or positive life stress illness correlations or uncontrollable positive life stress correlations. Thus, perceptions of control were related to illness measures, but only in direct relation to life stress. Hypothesis 6 was partially supported, as was Hypothesis 7.

Social Support

Another moderational variable that was studied was social support. The students in this study tended to receive most of their social support from their friends (60%). Another large proportion came from their parents (20%). The rest of the support came from siblings, bosses, counselors, coaches, ministers, and coworkers. Subjects tended to rate their parents and other relatives higher than other supporters on the amount of and satisfaction with support. Friends and parents were most accessible for these college students (see Table 22).

As Ell (1984) pointed out, social support is a multidimensional concept. In accordance with this concept and the suggestions of Cohen and Hoberman (1983), the present study considered frequency of, satisfaction with, amount of, and six types of social support. The buffering hypothesis (Cohen & McKay, 1984) was investigated by examining Hypothesis 8.

Hypothesis 8 — Stability of Social Support Interactions

The first of the social support hypotheses was Hypothesis 8.

Hyp 8: Social support will moderate the relationship between life events and illness in that the relationship will be weak for individuals with high, stable support systems. (This hypothesized pattern implies that high, stable support systems act as buffers against stress.)

Hypothesis 8, pertaining to social support, was investigated by studying number of helpers and frequency and amount of social support. Only stable social support was studied so that a change in social support itself would not be a life stressor, thus confounding social support and life stress (Thoits, 1982). For the present study, subjects were considered to have stable support if the difference between the number of helpers or amount of support (identified on the CSSM) or the frequency of support (from the ISSB) between Time one and Time two were less than or equal to one-half a standard deviation above the mean of this difference for the entire sample.

Frequency of Social Support

Frequency of social support was defined as the frequency of natural supportive behaviors that were based on Caplan's (1976) ideas and included on the ISSB (Barrera, Sandler, & Ramsay, 1981). For subjects with a stable frequency of social support, 21 out of 27 regression analyses had significant overall effects. That is, combinations of negative and total life stress and stable frequency of social support accounted for a significant amount of the variance of the three illness variables (4 to 28% of the variance).

Of these significant overall effects, 12 showed significant interaction effects. In other words, stable frequency of support moderated the life stress-illness relationships approximately 50% of the time. In all cases, people with more frequent, stable social support tended to have stronger relationships between life stress and illness than those with less frequent stable support. This finding ran contrary to

Thoits' (1982) prediction that life stress would have a weaker relationship with illness for individuals with higher initial levels of social support. On the contrary, with less frequent stable support levels, life stress had a weaker relationship with illness. Less frequent social support actually seemed, in this study, to buffer the effects of life stress. This finding was opposite to that predicted in Hypothesis 8.

The correlations in Table 36 suggested, however, that frequency of support was directly related to physical health rather than psychophysiological or emotional health. The more frequent the amount of support, the more physical symptoms noted. Having people around more often may actually have caused some sort of stress instead of buffering it. This notion may have also explained the moderational effects of frequency of support.

In conclusion, although stable frequency of support moderated the life stress-illness relationship, the results did not support the hypothesized direction of the buffering hypothesis. These results suggested instead that the impact of life stress on illness was lessened with less frequent social support. One possible interpretation of this finding was that people may have needed stable social support, but not quite as frequently as earlier believed.

Number of Helpers

Similar to the results above, negative and total life stress combined with stable number of helpers contributed significantly to the variance of the three illness variables (4 to 22%). Only 3 of the 27

regression analyses showed moderational effects for stable number of helpers. Stable number of helpers moderated the relationship between total life stress(1) and the BDI(1) and LPIS(2), and positive life stress(1) and the BDI(1). These results were too minimal to conclude that number of helpers moderated the life stress-illness relationship.

However, once again, for individuals who had a fewer number of helpers (i.e., number of social supporters), life stress had less of an impact on illness symptoms than for those who had more helpers. This finding also ran contrary to the hypothesized direction of the buffering hypothesis which states that the negative effects of stress on health will be lessened for individuals with stronger supports (Dean & Lin, 1977). These results suggested the opposite finding, although not significantly.

Amount of Social Support

The results from stable amount of support duplicated the results from number of helpers. Stable amount of support in combination with life stress accounted for a significant amount of the illness variance. However, stable amounts of support did not moderate the life stress-illness relationship. Only 2 of a possible 27 analyses showed significant results. Once again, contrary to the buffering hypothesis, life stress was more related to illness for individuals with higher amounts of support.

In general, Hypothesis 8 was only partially supported with stable frequency of support. Contrary to the buffering hypothesis, less frequent support buffered the effects of stress. Amount of support

and number of helpers did not buffer the effects of stress. In addition, there appeared to be a significant relationship between the frequency of support, amount of support, and number of helpers subjects had between Time one and Time two (r = .65, .47, .64, respectively). Because of this overall powerful relationship, the distinction between individuals with and without stable social support may not have been as precise as desired.

Other important aspects of social support studied were satisfaction with and types of support. Satisfaction with support was addressed first.

Hypothesis 9 — Satisfaction with Support

Hypothesis 9 dealt with satisfaction with support.

Hyp 9: The relationship between life stress and illness will be stronger for those individuals who are less satisfied with the general support they receive than for those who are more satisfied.

Satisfaction with Support Interactions

Twenty-four out of 27 regression analyses showed significant overall negative effects for combinations of life stress and satisfaction with support, in predicting the three illness variables. Three to 27% of the illness variable variance was accounted for by life stress combined with satisfaction with support. Thus, a large percentage of illness variance was accounted for by variables other than

those mentioned.

Only two of the analyses showed significant interaction effects to support the notion that satisfaction with support was an important moderator variable. These results were likely due to chance. Within each of these significant interactions, for individuals with lower satisfaction with support, life stress had a stronger impact on illness symptomatology than for those with higher satisfaction with support. Although these findings supported the tendency toward the buffering effect of high satisfaction with support, they were non-significant, unlike those of Sandler and Barrera (1984). Hypothesis 9 was not supported.

By looking at Table 36, one can see that satisfaction with support was significantly negatively related to the BDI and the LPIS, although the correlations were quite small. The correlations did suggest, however, that how satisfied individuals were with the support they received may have had a greater impact on their emotional and psychophysiological functioning than on their physical functioning. The more satisfied individuals were with the support they received, the less likely they were to experience psychophysiological or depressive symptoms.

One word of caution needed to be addressed. The measure of satisfaction with social support was developed for this project and like Sandler and Barrera's (1984) measure, it only asked individuals to rate satisfaction with support on a small scale (e.g., 3-5 points).

Relationships between Frequency of, Amount of, Availability of, and Satisfaction with Support

As one might predict, satisfaction with support significantly increased as the amount of and availability of social support also increased. There was also a significant positive relationship between satisfaction with support and frequency of support; however, the correlations were smaller than the previously noted relationships. Thus, the overall ratings of the amounts of support (e.g., none versus a lot) appeared to be more important to individuals' satisfaction with support than the frequency with which they received this support. In addition, amount of social support was not highly related to frequency of social support. This difference may have been due to the fact that each was measured by a different inventory or because subjects were not accurate in perceiving the amount or frequency of support they received.

Hypothesis 10 — Types of Social Support

Another important distinction related to social support was between different types of support. Past research has suggested that types of supportive interactions produced differential effects on illness symptomatology (Cutrona, 1984). Thus, this study dealt with six different types of support in Hypothesis 10.

Hyp 10: The buffering effect of social support will vary depending on the type of support received.

Types of Support Interactions

One fruitful area of research concerned Weiss' (1974) various provisions of social support. Six types of provisions, taken from the SPS (Russell & Cutrona, 1984), were investigated, and included opportunity for nurturance, reliable alliance, reassurance of worth, guidance, social integration, and attachment. One hundred and fifty out of 162 regression analyses had overall significant regression results. Life stress in combination with each of the six different types of social support accounted for a significant amount of the illness variance (3 to 31%).

When addressing the question of whether or not types of social support moderated the relationship between life stress and illness, one must keep in mind that only 22 out of the 162 analyses resulted in significant interactions (i.e., 14%). Thus, these results could have occurred by chance. Only opportunity for nurturance showed any consistent moderational effects (35% of the time). Thus, the remainder of this discussion is speculative due to the tenuous nature of the findings.

Of the significant interaction effects noted, low levels of each type of support buffered the effects of life stress on psychophysiological and physical symptoms. This finding ran contrary to the buffering hypothesis. Types of support did not moderate the relationship between life stress and depression. Thus, as in the findings of Cohen and Hoberman (1983), different types of support significantly interacted with life stress to predict only certain illnesses. Unlike these researchers, however, the present study did not find support for the hypothesized direction of the buffering hypothesis.

Opportunity for nurturance showed the greatest consistency of moderational effects. This type of support resembled the relationship between a parent and a child, and suggested that the individual was responsible in some way for the health of another (i.e., a person depended on the individual). In the present study, individuals who were less responsible for another person showed less significant relationships between life stress and illness than those who were more responsible for another person. Life stress had less of an impact on illness if individuals were less responsible for another person. This finding suggested that lack of responsibility for others may have helped to buffer the effects of stress. Provision of care for another human being may have taken away the individual's resources to deal with stress. Resources may have been needed to be spread between two people; thus, less energy was left to buffer the effects of stress for any one person. Also, having had responsibility for someone else may have been a stressor in itself.

In conclusion, Hypothesis 10 was partially supported. The buffering effect of social support differed depending on the type of support received. The buffering effects of opportunity for nurturance were more consistent than the effects of the other types of support. How types of support were related to other variables will be discussed in the next four sections.

Relationships between the Different Measures of Social Support

All of the six types of social support were significantly positively related to the amount of, satisfaction with, and frequency of

support. These findings suggested that as the amount, frequency, or satisfaction with support increased, so did individuals' experiences with all six types of social support.

Relationships between the Different Types of Social Support

There was some consistency as to how much of each type of support individuals received between Time one and Time two (correlations ranged from .38 to .62). Only reliable alliance showed a test-retest correlation less than .50, suggesting that reception of assistance such as loans of money was not a very stable form of support.

All of the six types of support were significantly positively related to one another. As individuals experienced one type of support, they were likely to experience others. Noteably, guidance and reliable alliance, and guidance and attachment were significantly related when measured at the same time. People who had supports that had expertise and could be relied on for advice also had supports that they could rely on for general assistance (e.g., giving money) or had supports that they felt very close to (e.g., attachment).

Relationship between Life Stress and the Types of Social Support

Types of social support were mildly significantly related to positive life stress(1) and negative life stress(2). As individuals experienced more positive life stress(1), they concurrently experienced more attachment, social integration, reassurance of worth, reliable alliance, and guidance (Time one). As subjects experienced less negative life stress(2), they experienced more attachment, social

integration, reassurance of worth, and reliable alliance (Time 2). Otherwise, life stress and types of social support were not significantly related.

Relationship between Illness and the Types of Social Support

Types of social support were directly related in particular to emotional (depressive) and psychophysiological functioning, but not to physical illness. This finding was in contrast to the buffering effects of types of support only with psychophysiological and physical symptoms. Individuals who had close attachments (i.e., high attachment and/or social integration scores) compared to those who lacked them showed less depressive or psychophysiological symptoms. A similar result was that individuals whose supports provided a sense of competency (i.e., reassurance of worth), assistance (i.e., reliable alliance), or advice (i.e., guidance) showed less depressive and psychophysiological symptoms than those whose supports did not do so. These results supported previous findings concerning a negative relationship between social support and psychological or depressive dysfunctioning (Dean, Lin, & Ensel, 1981; Holahan & Moos, 1981).

Opportunity for nurturance was not directly related to illness; however, as noted earlier, it appeared to moderate the relationship between life stress and illness. Thus, the impact of not having responsibility for someone was evident when life stress was considered, but not independent of life stress. Opportunity for nurturance buffered the effects of stress, but was not directly related to illness, whereas the opposite was true for all other types of social

support except for reassurance of worth.

Researchers developed the distinctions between the six types of social support. This study also investigated how individuals perceived support.

Hypothesis 11 — Appropriate Social Support

Hypothesis 11 dealt with individual perceptions of support.

Hyp 11: Subjects who receive appropriate (i.e., helpful as defined by the subject) social support for dealing with their most stressful experience will show less psychological and physical dysfunctioning (i.e., a stronger buffering effect) than those who receive less appropriate support.

Ell (1984), Cohen and McKay (1984), and Cutrona (1984) suggested that researchers investigate individuals' perceptions of supportive behaviors. Thus, this study included a small preliminary study of such perceptions. Appropriate support was defined as support that subjects found helpful in dealing with a particular stressor. To investigate the effects of appropriate support, subjects were asked to choose the most stressful event that happened to them over the past year. Then, with this event in mind, they completed the 40 ISSB items according to the appropriateness of the support (on a 1-5 rating scale) and the frequency of each form of support they actually received from their most helpful individual (on a 1-5 rating scale).

In order to develop a measure of appropriate support, total difference scores were created by taking appropriateness ratings minus

frequency ratings. The total difference score (i.e., moderational variable) then equalled the sum of the absolute values of these difference scores across all 40 ISSB items. Consistent with the above hypothesis, it was predicted that for subjects whose total difference scores were fairly low (i.e., received support proportional to its appropriateness for the chosen event), life stress would have less of an impact on illness than for those with high total difference scores (i.e., received less frequent appropriate support or more frequent, less appropriate support).

Thirteen of the 18 regression analyses completed, using combinations of life stress and the total difference scores to predict the three illness variables, had significant overall regression effects. This finding suggested that life stress in combination with appropriate support accounted for a significant amount of the illness variance (5 to 21%).

Five of these 18 regression analyses had significant interaction effects, suggesting that appropriate support did, in part, moderate the life stress-illness relationship. One must also keep in mind, however, that these findings were somewhat limited because only ratings concerning one event and one helper were used. Had more events or supporters been considered, the results might have been more significant.

The general finding was that for individuals who received a proper frequency of appropriate support (i.e., low total difference scores), life stress had more of an impact on illness than for individuals who received less frequent appropriate support or more

frequent, less appropriate support. This finding ran contrary to the hypothesized direction of the moderational effects of appropriate support. It was difficult to distinguish whether the individuals with high total difference scores had high scores because they received less frequent appropriate support, or because they received more frequent, less appropriate support. Theoretically, it made more sense to assume that appropriateness of support was less important than frequency of support. If appropriateness of support was more important, then the moderational effects would have resulted in the hypothesized direction. However, this was not the case. More specific analyses would have been helpful, but were too complex to be included in this study.

A number of possible conclusions could be drawn from these findings. First, the appropriateness of support may not have been an important factor in influencing the life stress-illness relationship. Amount of support may have been more important. Second, subjects may have been poor assessors of what types of support were truly beneficial to them. Subjects may have believed that a certain kind of support helped them with their most stressful event, yet in actuality, that kind of support had no impact on how they dealt with that stress. Third, the retrospective nature of the study may have interfered with subjects' memories of how frequently they actually received support. A more adequate test of this hypothesis would have been to give subjects who experienced a similar event different types of support and then measure their health functioning. Finally, only one life event and one helper were studied, which may not have been an

adequate measure. The individuals may have received more appropriate support from people who were not identified as the most supportive person.

One should also note that appropriateness of support only moderated the relationship between life stress and depression and psychophysiological functioning, and not physical symptoms. In addition, appropriateness of support did not moderate the relationship between positive life stress and any of the illness variables.

Summary of Social Support

In general, life stress combined with social support accounted for a portion of the variance of the three illness variables. Social support did not moderate the relationship between positive life stress and illness. In addition, unlike Cohen and McKay's (1984) and Hobfoll and Walfisch's (1984) findings, little support for the hypothesized direction of the buffering hypothesis was found. In most cases, having less social support actually buffered the effects of stress. The only moderation effects that were in the hypothesized direction of the buffering hypothesis dealt with satisfaction with support; however, these effects were not significant. Thus, like Flaherty et al. (1983) and Gad and Johnson (1980), this study did not find direct support for the buffering hypothesis.

A few social support variables moderated the life stress-illness relationship. More specifically, if the individuals had less frequent stable support, were less responsible for the well-being of another,

or had more frequent, less appropriate support, life stress was less strongly related to illness. Satisfaction with support, stable number of helping individuals, and stable amount of support did not moderate the life stress-illness relationship.

Looking at correlational data, the more frequently individuals had support, the more physical ailments they experienced. However, the more satisfied they were with support and the more they received the various types of support (except for opportunity for nurturance), the less depressive and psychophysiological symptoms they reported. These results supported the previous findings by Dean, Lin, and Ensel (1981) and Holahan and Moos (1981) which noted that there was a negative relationship between social support and psychological or depressive dysfunctioning.

While the independent moderational effects of attributional style and social support have been discussed, the interactions of these two variables were also important. The next section will discuss how these two variables interacted to affect the life stress-illness relationship.

Hypothesis 12 — Interactions between Attributions and Social Support as Moderators

The final hypothesis considered in this study was Hypothesis 12.

Hyp 12: The impact of social support on the life stress-illness relationship will differ for individuals with different attributional styles.

As can be seen from Table 39, combinations of life stress, attributional style, and frequency of social support contributed to a portion of the illness variable variance (5 to 34%). Although this was a statistically significant amount, other variables not investigated in this study accounted for the remaining amount of variance.

Of the 108 regression analyses completed, 17 (16%) had a significant interaction term suggesting that the impact of social support on the life stress-illness relationship minimally differed depending upon the attributional style of the subjects. In some cases, attributional style modified the moderational impact of frequency of social support, thus partially supporting Hypothesis 12. While these results could have been due to chance, the remainder of this discussion will clarify the interpretations of these results.

When people who externalized the sources of stress (i.e., low internality) or believed they had little control (i.e., low controllability) over the stress in their lives received more social support, positive life stress was more likely to lead to illness. This may have been because support from others reinforced their belief that they were helpless in influencing positive, yet stressful aspects of their lives. Thus, positive stress may have led to lowered self-esteem and to more depressive and psychophysiological symptoms. Similarly, when individuals who internalized sources of negative life stress received more social support, they too may have felt more helpless (i.e., because others believed they needed help and gave it to them). Negative life stress then led to more illness.

When individuals believed that the sources of stress were unstable and social support increased, life stress was more likely to lead to depressive and psychophysiological symptoms. The more people were present, the more likely they could have become separate, unstable causes of stress. In addition, for individuals who believed that stress had an impact on many parts of their lives (i.e., globality), when they received more social support, they may have interpreted the situation as stress then having an impact on more lives (e.g., their supporters) other than their own. Concern for others may have led to more worrying, thus led to more illness.

In summary, Hypothesis 12 was partially, although weakly supported. In general, attributional style did not have an impact on how social support moderated the life stress-illness relationship.

Factors Influencing Responses

Several factors were investigated to identify their influence on inventory responses. These factors, social desirability and present level of stress, may have influenced how subjects responded to the inventories in this study, thus modifying the true correlational relationships that existed between the variables.

Social Desirability

Social desirability was a potential response bias that may have had important impacts on life stress-illness relationships. Lack

of control of social desirability in stress-illness studies, as pointed out by Krause (1985), may mask the effects of moderator variables.

Illness Variables

Social desirability was related to how individuals completed the three illness measures. The general finding was that individuals with higher needs for social approval also tended to note less illness symptoms on the three illness measures. This finding needs to be kept in mind because subjects may have been reporting less illness than actually existed which, in turn, could have changed life stress-illness relationships.

Experienced Life Stress

Social desirability was related to negative and total life stress in that subjects who had higher needs for social approval tended to note less negative life stress. This finding, combined with the results of social desirability related to illness reporting, suggested that the life stress-illness relationship found for individuals who needed social approval may have been less significant than would have been found if these individuals had not worried about approval. Although the social desirability correlations were not very high, the effects of social desirability should have been controlled before true relationships were established.

Anticipated Life Stress

The number of anticipated events subjects were willing to acknowledge was mildly significantly related to social desirability. The higher their need for social approval, the less subjects were willing to note anticipated stressors. However, when subjects were later asked to report whether or not the stressors they anticipated actually occurred, individuals with high needs for social approval reported that more anticipated stressors had actually occurred.

Social Support

Social support was not significantly related to social desirability. Only reassurance of worth was consistently related to social desirability. Individuals with high needs for approval tended to also rely on others as major sources of esteem and competence. Even this relationship, which made conceptual sense, was not particularly strong.

Attributional Style

The attributional dimensions of stability and globality were the dimensions that significantly correlated with social desirability. The correlations were low and no pattern was found for the dimension of stability. However, higher attributions of globality were associated with lower social desirability scores.

Present Stress Levels

Subjects' ratings of present stress levels (e.g., over the last week) were related to how they completed all of the experienced and anticipated life stress and illness measures (except for positive life stress). Higher present levels of stress were associated with higher amounts of the other variables. If subjects were experiencing more present stress, they were more likely to rate past experienced stress or illness higher. Present level of stress was not something that could have been controlled for easily; however, future researchers should examine its impact when completing life stress research.

The remainder of the discussion focuses upon further limitations of the study, offers suggestions for future research, and provides an overall summary. Each of these topics will be discussed in a separate section.

LIMITATIONS OF THE STUDY

A discussion of study limitations will be presented in the following order: the retrospective and prospective aspects of the study, the inventories, social desirability, one of the hypotheses, subjects, and magnitude of the results. Each of these topics will be discussed in separate paragraphs.

First, the retrospective and prospective aspects of this study provided concerns that should be noted. Although this study had a prospective component, the length of time between measurements was only seven weeks. A longer time period could have helped prevent the confounding of Time one and Time two illness and may have minimized the confusion about whether the reason that illness(1)-life stress(2) correlations did not differ from life stress(1)-illness(2) correlations was because of the close relationship in time of illness(1) and life stress(2). In addition, parts of the study were retrospective in nature. Subjects were often asked to remember and report events from as much as a year ago (e.g., LES(1)). Factors such as forgetting, selective distortion, denial, and "effort after meaning" may have influenced the results such that less life stress was noted. The loss of this information may have reduced the magnitude of the results.

Second, several aspects of the inventories used in this study should be noted. This study required subjects to complete a number of different instruments at one time. Although the order of presentation of the instruments was counterbalanced, subjects may have spent less time reflecting upon their responses to any one inventory than

they might have if fewer inventories had been used. In addition, the anticipated stress measure and CSSM were developed specifically for this study. These instruments may not have been optimally precise to measure the concepts they were designed to measure. New instruments need to be developed that have demonstrated and acceptable reliability and validity. Finally, the illness measures appeared to be quite interdependent. Because of these interrelationships, the separate impact of life stress on the three illness variables was somewhat difficult to determine.

Third, both social desirability and present stress levels were significantly related to life stress and illness. Individuals with higher needs for approval acknowledged less illness symptoms and less negative life stress. Individuals with higher present stress levels acknowledged more life stress, anticipated stress, and illness symptomatology than those with lower present stress levels. The actual magnitude of life stress-illness relationships may not have been completely detected because social desirability and present level of stress, both potentially confounding variables, were not precisely controlled.

Fourth, the information obtained in this study was not complete enough to truly test Hypothesis 11 (e.g., only one event and one helper were used). The study only provided preliminary data and suggestions for future research in the area of appropriateness of support. More stressful events, supportive helpers, and complex analyses need to be studied in order to adequately test the impact of appropriate support on the life stress-illness relationship.

Finally, there were limitations concerning the magnitude of the findings and the subject sample. Only students were used as subjects. Students often show less pathology, life stress, and illness than other groups, thus, possibly minimizing true life stress-illness relationships. In addition, life stress-illness correlations rarely reached values higher than .30; thus, one needed to be very careful about interpreting these findings. Life stress only appeared to account for about 10% of the illness variance, leaving 90% of the variance unaccounted for. Some of this variance, however, was estimated as being attributable to combinations of life stress with social support, perceptions of control, or attributional style. These limitations have led to several suggestions for future research, as noted in the next section.

SUGGESTIONS FOR FUTURE RESEARCH

Anticipated stress and appropriateness of support could be investigated in more detail. Several questions remain unanswered: Does the anticipation of stress itself cause problems? How close in time to the actual event do ratings of anticipated stress need to be in order to show effects on psychological or physical functioning? Do individuals who receive a high amount of appropriate (i.e., helpful as defined by the subject) social support show less psychological and physical dysfunctioning, than those who receive any amount of inappropriate support or a low amount of appropriate support? Is the appropriateness of support more important than amount of support for dealing with stressful events? One way to study these questions might be to give different types and amounts of support to different groups who have experienced the same stressor, and then to monitor their mood changes. Well-researched measures of anticipated stress as well as social support need to be developed to aid in the investigation of the questions posed above.

Other related areas of research could also be investigated. Models other than the vulnerability hypothesis could and probably should be studied. Dohrenwend and Dohrenwend (1981) suggested five other models concerning the relationships between life stress, social support, personal dispositions, and illness. For example, the "additive burden hypothesis" could be studied to see if social situations and personal dispositions add to the impact of stressful events on illness, instead of moderating the life stress-illness relationship. Another hypothesis, called the "proneness hypothesis," suggests that

the presence of illness itself leads to stressful events, which in turn create more illnesses. An additional new research area termed daily hassles is being explored and may have relevance to life stress-illness relationships. In fact, it has been suggested that these hassles may account for a large percentage of the illness variance unaccounted for by major life stressors (Monroe, 1983). Studying how daily hassles interact with major stressors could be very fruitful research.

Attributional research could be expanded and explored more precisely. The temporal sequence of life stress, attributional appraisals, and depression needs to be investigated more closely. An important question concerns how long the time period needs to be for appraisals to significantly affect moods (Cochran & Hammen, 1985). In addition, to adequately test the reformulated learned helplessness hypothesis with correlational data, information and evidence from more than one point in time will be needed (Williams, 1985). To support this hypothesis, researchers need to demonstrate that the attributions preceded the mood change and not vice versa.

Furthermore, another area of attribution research that should be considered concerns the study of what types of attributions are made for different types of life events. With this information, researchers will be better able to differentiate between dispositional attributional styles and attributions that are based upon the specific event in question.

Finally, social desirability, as it affects correlational life

stress-illness studies, needs to be studied and subjected to statistical controls. Although the relationship between social desirability and illness or life stress was small, social desirability still had an impact and could have distorted true life stress-illness relationships. As noted by Krause (1985), the moderational effects of some variables may not have appeared if social desirability was not considered.

SUMMARY

Despite the limitations noted in an earlier section, this study provided important new information on the relationships between life stress, illness, social support, attributional style, and perceptions of control. Few studies in the past had considered the joint and interactive impact of so many variables. These relationships will be summarized below. In addition, the study also provided more information on the validity of the vulnerability hypothesis, the buffering hypothesis, and the reformulated learned helplessness hypothesis with a variety of moderating variables.

In general, life stress in combination with social support, perceptions of control, and/or attributional style accounted for a significant amount of the illness variance. Unlike past research, attributional style and perceptions of control did not perform as stable, individual dispositions in this study. The specific event being considered had a great impact on the type of attribution chosen and the subjects' perceptions of control. As in past research, life stress was significantly related to illness; however, this study emphasized the importance of stress in regard to physical illnesses. This study also provided evidence that undesirability was an important concept to consider. Negative life stress tended to have a stronger relationship with illness than did positive life stress. A variable which had only recently appeared in the research literature, anticipated stress, was shown to be related to illness, although not as strongly as experienced life stress was. Finally, the data indicated that

subjects were good at predicting how stressful events would be for them. This finding may provide incentive for further research in this area.

The vulnerability hypothesis (Dohrenwend & Dohrenwend, 1981) was only partially supported through the attributional dimension of stability. The general finding was that individuals who tended to attribute the causes of stressful events to unstable causes were more vulnerable to the effects of stress (i.e., showed a strong relationship between life stress and illness). Thus, this study identified one attributional dimension that had an effect on the life stress-illness relationship. Consistent with the reformulated learned helplessness hypothesis, individuals who used more global and internal attributions also showed more depression than those who did not. Globality was also significantly related to increases in psychophysiological and physical symptoms; thus, this study expanded the RLHH to illnesses other than depression. However, attributional style did not moderate the relationship between uncontrollable negative life stress and illness.

The vulnerability hypothesis was partially supported with perceptions of control. For individuals who believed they had experienced less controllable stressful events, stress had a stronger impact on illness than for those who believed they had experienced more controllable stressful events. In addition, perceptions of control were not directly related to illness regardless of whether the perceptions were of experienced or hypothetical events. Uncontrollable negative life stress also tended to be related to illness more than controllable

negative or uncontrollable/controllable positive life stress. Thus, this study pointed out the importance of perceptions of control of experienced events.

The hypothesized direction of the buffering hypothesis (Cohen & McKay, 1984; Thoits, 1982) was not supported by the social support data from this study. Less frequent support and less opportunity for nurturance buffered the relationship between life stress and illness, whereas satisfaction with support, amount of support, and stable number of helpers did not. In addition, proper amounts of appropriate support did not lessen the impact of stress. Appropriateness of support may not have been as important as frequency of support in influencing the impact of stress. Thus, the results of this study challenge previous findings that social support buffered the effects of stress. This study, instead, suggested that frequent social support may have been a type of stressor in itself, even if the support was stable (i.e., unchanging). In addition, this study identified specific support variables that had an impact on life stress-illness relationships, or that were directly related to illness symptomatology. For example, individuals who received all different types of support, were satisfied with the support they received. Those who received support which was easily available showed less psychophysiological and depressive symptoms than those who did not. The higher the frequency of support they received, the more physical symptoms they experienced.

Finally, the importance of a response bias variable was pointed out. Needs for approval (i.e., social desirability) interacted with

life stress and illness ratings such that individuals with high needs for approval acknowledged less illness and less negative life stress. This lessened reporting of life stress and illness may have minimized present study results.

REFERENCES

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Andrews, G., Tennant, C., Hewson, D. M., & Vaillant, G. E. (1978). Life events stress, social support, coping style, and risk of psychological impairment. Journal of Nervous and Mental Disease, 166(5), 307-316.

Aponte, J. F., & Miller, F. T. (1972). Stress-related social events and psychological impairment. Journal of Clinical Psychology, 28, 455-458.

Barrera, M., & Ainlay, S. L. (1983). The structure of social support: A conceptual and empirical analysis. Journal of Community Psychology, 11, 133-143.

Barrera, M., & Balls, P. (1983). Assessing social support as a prevention resource: An illustrative study. Prevention in Human Services, 2(4), 59-74.

Barrera, M., Sandler, I. N., & Ramsay, T. B. (1981). Preliminary development of a scale of social support: Studies on college students. American Journal of Community Psychology, 9(4), 435-447.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J. E., and Erbaugh, J. K. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.

Beehr, T. A. (1983). Relationship of Life Experiences Survey to internal/external control, social desirability, and work-related satisfaction. Psychological Reports, 52, 467-472.

Billings, A. G., & Moos, R. H. (1982). Stressful life events and symptoms: A longitudinal model. Health Psychology, 1(2), 99-117.

Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. Journal of Personality and Social Psychology, 46(4), 877-891.

Blaney, P. H., Behar, V., & Head, R. (1980). Two measures of depressive cognitions: Their association with depression and each other. Journal of Abnormal Psychology, 89, 678-682.

Brown, G. W. (1974). Meaning, measurement and stress of life events. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Brown, G. W. (1981). Life events, psychiatric disorder, and physical illness. Journal of Psychosomatic Research, 25, 461-473.

Brown, G. W., Bhrolchain, M. N., & Harris, T. (1975). Social class and psychiatric disturbance among women in an urban population. Sociology, 9, 225-254.

Brown, G. W., Harris, T. O., & Peto, J. (1973a). Life events and psychiatric disorders, Part 2: Nature of causal links. Psychological Medicine, 3, 159-176.

Brown, G. W., Sklair, F., Harris, T. O., & Birley, J. L. T. (1973b). Life events and psychiatric disorders, Part 1: Some methodological issues. Psychological Medicine, 3, 74-87.

Bruhn, J. G., & Philips, B. U. (1984). Measuring social support: A synthesis of current approaches. Journal of Behavioral Medicine, 7(2), 151-169.

Bumberry, W., Oliver, J. M., and McClure, J. N. (1978). Validation of the BDI in a university population using psychiatric estimate as a criterion. Journal of Consulting and Clinical Psychology, 46, 150-155.

Byrne, D. G. (1984). Personal assessments of life-event stress and the near future onset of psychological symptoms. British Journal of Medical Psychology, 57, 241-248.

Cadoret, R. J., Winokur, G., Dorzab, J., & Baker, M. (1972). Depressive disease: Life events and onset of illness. Archives of General Psychiatry, 26, 133-136.

Calicchia, J. P., & Pardine, P. (1984). Attributional style: Degree of depression, respondents sex, and nature of the attributional event. Journal of Psychology, 117, 167-175.

Caplan, G. (1976). The family as support system. In G. Caplan & M. Killilea (Eds.), Support systems and mutual help: Multidisciplinary explorations. New York: Grune and Stratton.

Casey, R. L., Masuda, M., & Holmes, T. H. (1967). Quantitative study of recall of life events. Journal of Psychosomatic Research, 11, 239-247.

Cleary, P. J. (1981). Problems of internal consistency and scaling of life event schedules. Journal of Psychosomatic Research, 25, 309-320.

Cline, D. W., & Chosey, J. J. (1972). A prospective study of life changes and subsequent health changes. Archives of General Psychiatry, 27, 51-53.

Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.

Cochran, S. D., & Hammen, C. L. (1985). Perceptions of stressful life events and depression: A test of attributional models. Journal of Personality and Social Psychology, 48, 1562-1571.

Cochrane, R., & Robertson, A. (1973). The life events inventory: A measure of the relative severity of psychosocial stressors. Journal of Psychosomatic Research, 17, 135-139.

Cohen, S., & Hoberman, H. M. (1983). Positive events and social support as buffers of life change stress. Journal of Applied Social Psychology, 13(2), 99-125.

Cohen, L. H., McGowan, J., Fooskas, S., & Rose, S. (1984). Positive life events and social support and the relationship between life stress and psychological disorder. American Journal of Community Psychology, 12(5), 567-587.

Cohen, S., & McKay, G. (1984). Social support, stress and the buffering hypothesis: A theoretical analysis. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), Handbook of psychology and health, Volume 4. Hillsdale, New Jersey: Lawrence Erlbaum Assoc.

Cooley, E. J., Miller, A. W., Keesey, J. C., Levenspiel, M. J., & Sisson, C. F. (1979). Self-report assessment of life change and disorders. Psychological Reports, 44, 1079-1086.

Cooper, B., & Sylph, J. (1973). Life events and the onset of neurotic illness: An investigation in general practice. Psychological Medicine, 3, 421-435.

Costello, C. G. (1982). Social factors associated with depression: A retrospective community study. Psychological Medicine, 12, 329-339.

Crandall, J. E., & Lehman, R. E. (1977). Relationship of stressful life events to social interest, locus of control, and psychological adjustment. Journal of Consulting and Clinical Psychology, 45, 1208.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16, 297-334.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. Journal of Consulting Psychology, 24, 349-354.

Crowne, D. P., & Marlowe, D. (1964). The approval motive: Studies in evaluative dependence. New York: John Wiley & Sons.

Cutrona, C. E. (1984). Social support and stress in the transition to parenthood. Journal of Abnormal Psychology, 93(4), 378-390.

Davies, B., Burrows, G., & Poynton, C. (1975). A comparative study of four depression rating scales. Australian and New Zealand Journal of Psychiatry, 9, 21-24.

Dean, A., & Lin, N. (1977). The stress-buffering role of social support: Problems and prospects for systematic investigation. Journal of Nervous and Mental Disease, 165, 403-417.

Dean, A., Lin, N., & Ensel, W. M. (1981). The epidemiological significance of social support systems in depression. In R. G. Simmons (Ed.), Research in community and mental health, Vol. 2. Greenwich, Connecticut: Jai Press.

Delongis, A., Coyne, J. C., Dakof, G., Folkman, & Lazarus, R. S. (1982). Relationship of daily hassles, uplifts, and major life events to health status. Health Psychology, 1(2), 119-136.

Dohrenwend, B. S. (1973). Life events as stressors: A methodological inquiry. Journal of Health and Social Behavior, 14, 167-175.

Dohrenwend, B. P. (1974). Problems in defining and sampling the relevant population of stressful life events. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Dohrenwend, B. S., & Dohrenwend, B. P. (1974). Overview and prospects for research on stressful life events. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Dohrenwend, B. S., & Dohrenwend, B. P. (1978). Some issues in research on stressful life events. Journal of Nervous and Mental Disease, 166, 7-15.

Dohrenwend, B. S., & Dohrenwend, B. P. (1981). Life stress and illness: Formulation of the issues. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events and their contexts. New York: Neale Watson Academic Publications, Inc.

Dohrenwend, B. S., Dohrenwend, B. P., Dodson, M., & Shrout, P. E. (1984). Symptoms, hassles, social supports, and life events: Problem of confounded measures. Journal of Abnormal Psychology, 93(2), 222-230.

Eaton, W. W. (1978). Life events, social supports, and psychiatric symptoms: A reanalysis of the New Haven Data. Journal of Health and Social Behavior, 19, 230-234.

Eaves, G., & Rush, A. J. (1984). Cognitive patterns in symptomatic and remitted unipolar major depression. Journal of Abnormal Psychology, 93, 31-40.

Eckenrode, J. (1983). The mobilization of social supports: Some individual constraints. American Journal of Community Psychology, 11(5), 509-528.

Eckenrode, J., & Gore, S. (1981). Stressful events and social supports: The significance of context. In B. H. Gottlieb (Ed.), Social network and social support, Volume 4. Beverly Hills: Sage Publications.

Ell, K. (1984). Social networks, social support, and health status: A review. Social Service Review, 58, 133-149.

Fairbank, D., & Hough, R. (1979). Life event classifications and the event-illness relationship. Journal of Human Stress, 5, 41-47.

Firth, J., & Brewin, C. (1982). Attributions and recovery from depression: A preliminary study using cross-lagged correlational analysis. British Journal of Clinical Psychology, 21, 229-230.

Flaherty, J. A., Gaviria, F. M., Black, E. M., Altman, E., & Mitchell, T. (1983). The role of social support in the functioning of patients with unipolar depression. American Journal of Psychiatry, 140(4), 473-476.

Fontana, A., Hughes, L., Marcus, J., & Dowds, B. (1979). Subjective evaluation of life events. Journal of Consulting and Clinical Psychology, 47, 906-911.

Fontana, A. F., Marcus, J. L., Noel, B., & Rakusin, J. M. (1972). Prehospitalization coping styles of psychiatric patients: The goal-directedness of life events. Journal of Nervous and Mental Disease, 55, 311-321.

Friedman, M., & Rosenman, R. H. (1974). Type A behavior and your heart. New York: Fawcett Crest.

Funch, D. P., & Marshall, J. R. (1984). Measuring life stress: Factors affecting fall-off in the reporting of life events. Journal of Health and Social Behavior, 25, 453-464.

Gad, M. T., & Johnson, J. H. (1980). Correlates of adolescent life stress as related to race, SES, and levels of perceived support. Journal of Clinical Child Psychology, 9, 13-16.

Garrity, T. F., Marx, M. B., & Somes, G. W. (1978). The relationship of recent life change to seriousness of later illness. Journal of Psychosomatic Research, 22, 7-12.

Garrity, T. F., Somes, G. W., & Marx, M. B. (1977). The relationship of personality, life change, psychophysiological strain, and health status in a college population. Science and Medicine, 11, 257-263.

Gatchel, R. J., Paulus, P. B., & Maples, C. W. (1975). Learned helplessness and self-reported affect. Journal of Abnormal Psychology, 84, 732-734.

Gersten, J. C., Langner, T. S., Eisenberg, J. G., and Orzeck, L. (1974). Child behavior and life events: Undesirable change or change per se? In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Goldberg, E. L., & Comstock, G. W. (1976). Life events and subsequent illness. American Journal of Epidemiology, 104, 146-158.

Golin, S., Sweeney, P. D., & Shaeffer, D. E. (1981). The causality of causal attributions in depression: A cross-lagged panel correlation analysis. Journal of Abnormal Psychology, 90, 14-22.

Gong-Guy, E., & Hammen, C. (1980). Causal perceptions of stressful events in depressed and nondepressed outpatients. Journal of Abnormal Psychology, 89, 662-669.

Gore, S. (1978). The effect of social support in moderating the health consequences of unemployment. Journal of Health and Social Behavior, 19, 157-165.

Grant, I., Yager, J., Sweetwood, H. L., & Olshen, R. (1982). Life events and symptoms: Fourier analysis of time series from a three-year prospective inquiry. Archives of General Psychiatry, 39, 598-605.

Hackett, G., & Lonborg, S. (1983). Models of stress. In E. M. Altmaier (Ed.), Helping students manage stress. San Francisco: Jossey-Bass, Inc.

Hammen, C. L., & Cochran, S. D. (1981). Cognitive correlates of life stress and depression in college students. Journal of Abnormal Psychology, 90, 23-27.

Hammen, C., & deMayo, R. (1982). Cognitive correlates of teacher stress and depressive symptoms: Implications for attributional models of depression. Journal of Abnormal Psychology, 91, 96-101.

Hammen, C., Krantz, S. E., & Cochran, S. D. (1981). Relationships between depression and causal attributions about stressful life events. Cognitive Therapy and Research, 5, 351-358.

Hammen, C., & Mayol, A. (1982). Depressive and cognitive characteristics of stressful life event types. Journal of Abnormal Psychology, 91, 165-174.

Hammer, M. (1983). Core and extended social networks in relation to health and illness. Social Science and Medicine, 17(7), 405-411.

Harder, D. W., Strauss, J. S., Kokes, R. F., Ritzler, B. A., & Gift, T. E. (1980). Life events and psychopathology severity among first psychiatric admissions. Journal of Abnormal Psychology, 89, 165-180.

Hargreaves, I. R. (1985). Attributional style and depression. British Journal of Clinical Psychology, 24, 65-66.

Heller, K., & Swindle, R. W. (1983). Social networks, perceived social support, and coping with stress. In R. D. Felner, L. A. Jason, J. N. Moritsugu, & S. S. Farber (Eds.), Preventive psychology: Theory, research, and practice. New York: Pergamon Press.

Herbert, D. J. (1978). Life changes and seriousness of illness in female college students. Psychological Reports, 43, 1297-1298.

Hirsch, B. J. (1980). Natural support systems and coping with major life changes. American Journal of Community Psychology, 8(2), 159-172.

Hobfoll, S. E., & Walfisch, S. (1984). Coping with a threat to life: A longitudinal study of self-concept, social support, and psychological distress. American Journal of Community Psychology, 12(1), 87-100.

Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. Journal of Abnormal Psychology, 90(4), 365-370.

Holmes, T. H., & Masuda, M. (1974). Life change and susceptibility. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. Journal of Psychosomatic Research, 11, 213-218.

Hough, R. L., Fairbank, D. T., & Garcia, A. M. (1976). Problems in the ratio measurement of life stress. Journal of Health and Social Behavior, 17, 70-82.

Hudgens, R. W., Robins, E., & Delong, W. B. (1970). The reporting of recent stress in the lives of psychiatric patients. British Journal of Psychiatry, 117, 635-643.

Husaini, B., & Neff, J. (1980). Characteristics of life events and psychiatric impairment in rural communities. Journal of Nervous and Mental Disease, 168, 159-166.

Jenkins, C. D., Hurst, M. W., & Rose, R. M. (1979). Life changes: Do people really remember? Archives of General Psychiatry, 36, 379-384.

Johnson, J. H., & Sarason, I. G. (1978). Life stress, depression and anxiety: Internal-external control as a moderator variable. Journal of Psychosomatic Research, 22, 205-208.

Johnson, J. H., & Sarason, I. G. (1979). Recent developments in research on life stress. In V. Hamilton & D. M. Warburton (Eds.), Human stress and cognition: An information processing approach. New York: John Wiley & Sons, pp. 205-233.

Kessler, R. C., & McLeod, J. D. (1984). Sex differences in vulnerability to undesirable life events. American Sociological Review, 49, 620-631.

Kiecolt-Glaser, J. K., & Greenberg, B. (1984). Social support as a moderator of the aftereffects of stress in female psychiatric inpatients. Journal of Abnormal Psychology, 93(2), 192-199.

Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. Journal of Personality and Social Psychology, 42(1), 168-177.

Krause, N. (1985). Stress, control beliefs, and psychological distress: The problem of response bias. Journal of Human Stress, 11, 11-19.

Langner, T. S. (1962). A twenty-two item screening scale of psychiatric symptoms indicating impairment. Journal of Health and Social Behavior, 3, 269-276.

Lanyon, R. I. (1970). Development and validation of a psychological screening inventory. Journal of Consulting and Clinical Psychology Monograph, 35, 1-24.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer Publishing Co.

Lehman, R. E. (1978). Symptom contamination of the schedule of recent events. Journal of Consulting and Clinical Psychology, 46, 1564-1565.

Lei, H., & Skinner, H. A. (1980). A psychometric study of life events and social readjustment. Journal of Psychosomatic Research, 24, 57-65.

Lewinsohn, P. M., Steinmetz, J. L., Larson, D. W., & Franklin, J. (1981). Depression-related cognitions: Antecedent or consequent? Journal of Abnormal Psychology, 90(3), 213-219.

Liao, W. (1977). Psychological stress, health status, and health behavior: Application of life changes concept. Psychological Reports, 41, 246.

Lin, N., & Ensel, W. M. (1984). Depression-mobility and its social etiology: The role of life events and social support. Journal of Health and Social Behavior, 25, 176-188.

Lin, N., Simeone, R. S., Ensel, W. M., & Kuo, W. (1979). Social support, stressful life events, and illness: A model and an empirical test. Journal of Health and Social Behavior, 20, 108-119.

Lloyd, C. (1980). Life events and depressive disorder reviewed. Archives of General Psychiatry, 37, 541-548.

Manly, P. C., McMahon, R. J., Bradley, C. R., & Davidson, P. O. (1982). Depressive attributional style and depression following childbirth. Journal of Abnormal Psychology, 91, 245-254.

Marx, M. B., Garrity, T. F., & Bowers, F. R. (1975). The influence of recent life experience on the health of college freshmen. Journal of Psychosomatic Research, 19, 87-98.

Matias, R. G. (1978). The relationship between clients' reported stressful life events and judged severity of presenting problems at a university counseling service. Dissertation Abstracts International, 38 (7-B), 3128-3129.

Matheny, K. B., & Cupp, P. (1983). Control, desirability, and anticipation as moderating variables between life change and illness. Journal of Human Stress, 9, 14-23.

McFarlane, A. H., Norman, G. R., Streiner, D. L., & Roy, R. (1983). The process of social stress: Stable, reciprocal, and mediating relationships. Journal of Health and Social Behavior, 24, 160-173.

McFarlane, A. H., Norman, G. R., Streiner, D. L., Roy, R., & Scott, D. J. (1980). A longitudinal study of the influence of the psychosocial environment on health status: A preliminary report. Journal of Health and Social Behavior, 21, 124-133.

McLanahan, S. S., & Sorensen, A. B. (1984). Life events and psychological well-being: A reexamination of theoretical and methodological issues. Social Science Review, 13, 111-128.

McLean, A. A. (1979). Work stress. Reading, Mass.: Addison-Wesley.

Mechanic, D. (1975). Some problems in the measurement of stress and social readjustment. Journal of Human Stress, 1(3), 43-48.

Metalsky, G. I., Abramson, L. Y., Seligman, M. E. P., Semmel, A., & Peterson, C. (1982). Attributional styles and life events in the classroom: Vulnerability and invulnerability to depressive mood reactions. Journal of Personality and Social Psychology, 43, 612-617.

Miller, I. W., Klee, S. H., & Norman, W. H. (1982). Depressed and nondepressed inpatients, cognitions of hypothetical events, experimental tasks, and stressful life events. Journal of Abnormal Psychology, 91, 78-81.

Monroe, S. M. (1982a). Assessment of life events: Retrospective vs. concurrent strategies. Archives of General Psychiatry, 39, 606-610.

Monroe, S. M. (1982b). Life events and disorder: Event-symptom associations and course of disorder. Journal of Abnormal Psychology, 91, 14-24.

Monroe, S. M. (1983). Social support and disorder: Toward an untangling of cause and effect. American Journal of Community Psychology, 11(1), 81-97.

Monroe, S. M., Imhoff, D. F., Wise, B. D., & Harris, J. E. (1983). Prediction of psychological symptoms under high-risk psychosocial circumstances: Life events, social support, and symptom specificity. Journal of Abnormal Psychology, 92(3), 338-350.

Morrison, J. R., Hudgens, R. W., & Barchha, R. G. (1968). Life events and psychiatric illness. British Journal of Psychiatry, 114, 423-432.

Mueller, D. P., Edwards, D. W., & Yarvis, R. M. (1977). Stressful life events and psychiatric symptomatology: Change as undesirability. Journal of Health and Social Behavior, 18, 307-317.

Murphy, E., & Brown, G. W. (1980). Life events, psychiatric disturbance, and physical illness. British Journal of Psychiatry, 136, 326-338.

Murrell, S. A., & Norris, F. H. (1983). Resources, life events, and changes in psychological states: A prospective framework. American Journal of Community Psychology, 11(5), 473-491.

Myers, J. D., Lindenthal, J. J., & Pepper, M. P. (1971). Life events and psychiatric impairment. Journal of Nervous and Mental Disease, 152, 149-157.

Nelson, D. W., & Cohen, L. H. (1983). Locus of control and control perceptions and the relationship between life stress and psychological disorder. American Journal of Community Psychology, 11(6), 705-722.

Norbeck, J. S., & Tilden, V. P. (1983). Life stress, social support, and emotional disequilibrium in complications of pregnancy: A prospective, multivariate study. Journal of Health and Social Behavior, 24, 30-46.

Nuckolls, K. B., Cassel, J., & Kaplan, B. H. (1972). Psychosocial assets, life crises and the prognosis of pregnancy. American Journal of Epidemiology, 95, 431-441.

O'Hara, M. W., Rehm, L. P., & Campbell, S. G. (1982). Predicting depressive symptomatology: Cognitive-behavioral models and postpartum depression. Journal of Abnormal Psychology, 91, 457-461.

Parkes, K. R. (1984). Locus of control, cognitive appraisal, and coping in stressful episodes. Journal of Personality and Social Psychology, 46(3), 655-668.

Pasahow, R. J. (1980). The relation between an attributional dimension and learned helplessness. Journal of Abnormal Psychology, 89, 358-367.

Passer, M. W., & Seese, M. D. (1983). Life stress and athletic injury: Examination of positive vs. negative events and three moderator variables. Journal of Human Stress, 9, 11-16.

Paykel, E. S. (1974). Life stress and psychiatric disorder: Applications of the clinical approach. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Paykel, E. S. (1976). Life stress, depression, and attempted suicide. Journal of Human Stress, 2, 3-12.

Paykel, E. S., Myers, J. K., Dienelt, M. N., Klerman, G. L., Lindenthal, J. J., & Pepper, M. P. (1969). Life events and depression: A controlled study. Archives of General Psychiatry, 21, 753-760.

Paykel, E. S., Prusoff, B. A., & Myers, J. K. (1975). Suicide attempts and recent life events. Archives of General Psychiatry, 32, 327-333.

Perkins, D. V. (1982). The assessment of stress using life events scales. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects. New York: Free Press.

Persons, J. B., & Rao, P. A. (1985). Longitudinal study of cognitions, life events, and depression in psychiatric inpatients. Journal of Abnormal Psychology, 94, 51-63.

Peterson, C. (1982). Learned helplessness and health psychology. Health Psychology, 1(2), 153-168.

Peterson, C., Schwartz, S. M., & Seligman, M. E. P. (1981). Self-blame and depressive symptoms. Journal of Personality and Social Psychology, 41, 253-259.

Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. Psychological Review, 91(3), 347-374.

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The attributional style questionnaire. Cognitive Therapy and Research, 6, 287-300.

Rabkin, J. G., & Struening, E. L. (1976). Life events, stress, and illness. Science, 194, 1013-1020.

Rahe, R. H. (1968). Life-change measurement as a predictor of illness. Proceedings of the Royal Society of Medicine, 61, 1124-1128.

Rahe, R. H. (1969). Life crisis and health change. In P. R. A. May & J. R. Witten (Eds.), Psychotropic drug response: Advances in prediction. Springfield, Illinois: Charles C. Thomas.

Rahe, R. H. (1974). The pathway between subjects' recent life changes and their near-future illness reports: Representative results and methodological issues. In B. P. Dohrenwend & B. S. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley.

Rahe, R. H. (1975a). Epidemiological studies of life change and illness. International Journal of Psychiatry in Medicine, 6, 133-146.

Rahe, R. H. (1975b). Life changes and near-future illness reports. In L. Levi (Ed.), Emotions — Their parameters and measurement. New York: Raven Press.

Rahe, R. H., & Arthur, R. J. (1968). Life-change patterns surrounding illness experience. Journal of Psychosomatic Research, 11, 341-345.

Rahe, R. H., & Arthur, R. J. (1978). Life change and illness studies: Past history and future directions. Journal of Human Stress, 4, 3-15.

Rahe, R. H., Biersner, R. J., Ryman, D. H., & Arthur, R. J. (1972). Psychosocial predictors of illness behavior and failure in stressful training. Journal of Health and Social Behavior, 13, 393-397.

Rahe, R. H., & Holmes, T. H. (1965). Social, psychological, and psychophysiological aspects of inguinal hernia. Journal of Psychosomatic Research, 8, 487.

Rahe, R. H., Mahan, J. L., & Arthur, R. J. (1970). Prediction of near-future health change from subjects' preceding life changes. Journal of Psychosomatic Research, 14, 401-406.

Rahe, R. H., McKean, J. D., & Arthur, R. J. (1967). A longitudinal study of life-change and illness patterns. Journal of Psychosomatic Research, 10, 355-366.

Rahe, R. H., Meyer, M., Smith, M., Kjaer, G., & Holmes, T. H. (1964). Social stress and illness onset. Journal of Psychosomatic Research, 8, 35-44.

Raps, C. S., Peterson, C., Reinhard, K. E., Abramson, L. Y., & Seligman, M. E. P. (1982). Patient attributional style among depressed patients. Journal of Abnormal Psychology, 91, 102-108.

Rothwell, N., & Williams, J. M. G. (1983). Attributional style and life events. British Journal of Clinical Psychology, 22, 139-140.

Russell, D., & Cutrona, C. E. (1984). The social provisions scale. Unpublished manuscript. University of Iowa, College of Medicine, Iowa City.

Sandler, I. N. (1980). Social support resources, stress, and maladjustment of poor children. American Journal of Community Psychology, 8, 41-52.

Sandler, I. N., & Barrera, M. (1984). Toward a multimethod approach to assessing the effects of social support. American Journal of Community Psychology, 12, 37-52.

Sandler, I. N., & Lakey, B. (1982). Locus of control as a stress moderator: The role of control perceptions and social support. American Journal of Community Psychology, 10(1), 65-80.

Sands, J. D., & Parker, J. (1979-80). A cross-sectional study of the perceived stressfulness of several life events. International Journal of Aging and Human Development, 10, 335-341.

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the life experiences survey. Journal of Consulting and Clinical Psychology, 46, 932-946.

Sarason, I. G., Levine, H. M., Basham, R., & Sarason, B. R. (1981). The assessment of social support. Seattle, Washington: Office of Naval Research Technical Report.

Sarason, I. G., & Sarason, B. R. (1984). Life changes, moderators of stress, and health. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), Handbook of psychology and health, Volume 4. Hillsdale, New Jersey: Lawrence Erlbaum Assoc.

Schaefer, C., Coyne, J. C., & Lazarus, R. S. (1981). The health-related functions of social support. Journal of Behavioral Medicine, 4(4), 381-405.

Schless, A. P., Teichman, A., Mendel, J., Weinstein, N. W., & Weller, K. (1977). Life events and illness: A three year prospective study. British Journal of Psychiatry, 131, 26.

Schroeder, D. H., & Costa, P. T. (1984). Influence of life event stress on physical illness: Substantive effects or methodological flaws? Journal of Personality and Social Psychology, 46, 853-863.

Seligman, M. E. P. (1981). A learned helplessness point of view. In L. P. Rehm (Ed.), Behavior therapy for depression: Present status and future directions. New York: Academic Press.

Seligman, M. E. P., Abramson, L. Y., Semmel, A., & von Baeyer, C. (1979). Depressive attributional style. Journal of Abnormal Psychology, 88, 242-247.

Selye, H. (1976). The stress of life, second edition. New York: McGraw-Hill.

Shader, R. I., Ebert, M. H., & Harmats, J. S. (1971). Langner's psychiatric impairment scale: A short screening device. American Journal of Psychiatry, 128, 596-601.

Siegel, J. M., Johnson, J. H., & Sarason, I. G. (1979). Mood states and the reporting of life changes. Journal of Psychosomatic Research, 23, 103-108.

Singer, J. E., & Lord, D. (1984). The role of social support in coping with chronic or life-threatening illness. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), Handbook of psychology and health, Volume 4. Hillsdale, New Jersey: Lawrence Erlbaum Assoc.

Stern, G. A., McCants, T. R., & Pettine, P. W. (1982). Stress and illness: Controllable and uncontrollable life events' relative contributions. Personality and Social Psychology Bulletin, 8, 140-145.

Stokes, J. P., & Wilson, D. G. (1984). The inventory of socially supportive behaviors: Dimensionality, prediction, and gender differences. American Journal of Community Psychology, 12, 53-69.

Stone, A. A. (1982). The objectivity and subjectivity of life events. Journal of Clinical Psychology, 38, 333-340.

Suls, J., & Mullen, B. (1981). Life change and psychological distress: The role of perceived control and desirability. Journal of Applied Social Psychology, 11, 379-389.

Syrotuik, J., & D'Arcy, C. (1984). Social support and mental health: Direct, protective, and compensatory effects. Social Science and Medicine, 18(3), 229-236.

Tausig, M. (1982). Measuring life events. Journal of Health and Social Behavior, 23, 52-64.

Taverna, B. (1983). Contributions of attributional style to the life events-illness relationship. Unpublished master's thesis, Iowa State University, Ames.

Tennant, C. (1983). Life events and psychological morbidity: The evidence from prospective studies. Psychological Medicine, 13, 483-486.

Thoits, P. A. (1982). Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. Journal of Health and Social Behavior, 23, 145-159.

Thomson, K. C., & Hendrie, H. C. (1972). Environmental stress in primary depressive illness. Archives of General Psychiatry, 26, 130.

Ulenhuth, E. H., & Paykel, E. S. (1973a). Symptom intensity and life events. Archives of General Psychiatry, 28, 473-477.

Ulenhuth, E. H., & Paykel, E. S. (1973b). Symptom configuration and life events. Archives of General Psychiatry, 29, 744-748.

Vinokur, A., & Selzer, M. L. (1975). Desirable versus undesirable life events: Their relationship to stress and mental distress. Journal of Personality and Social Psychology, 32, 329-337.

Wallston, B. S., Alagna, S. W., DeVeillis, B. M., & DeVeillis, R. F. (1983). Social support and physical health. Health Psychology, 2(4), 367-391.

Weiss, R. S. (1974). The provisions of social relationships. In Z. Rubin (Ed.), Doing unto others: Joining, molding, conforming, helping, loving. Englewood Cliffs, New Jersey: Prentice Hall.

Wilcox, B. L. (1981). Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. American Journal of Community Psychology, 9, 371-387.

Wildman, R. C., & Johnson, D. R. (1977). Life change and Langner's 22-item mental health index: A study and partial replication. Journal of Health and Social Behavior, 19, 179-188.

Williams, J. M. G. (1985). Attributional formulation of depression as a diathesis-stress model: Metalsky et al. reconsidered. Journal of Personality and Social Psychology, 48, 1572-1575.

Williams, J. M. G., & Brewin, C. R. (1984). Cognitive mediators of reactions to a minor life event: The British driving test. British Journal of Social Psychology, 23, 41-49.

Williams, A. W., Ware, J. E., & Donald, C. A. (1981). A model of mental health, life events, and social support applicable to general populations. Journal of Health and Social Behavior, 22, 324-336.

Wortman, C. B., & Dintzer, L. (1978). Is an attributional analysis of the learned helplessness phenomenon viable?: A critique of the Abramson, Seligman, and Teasdale reformulation. Journal of Abnormal Psychology, 87, 75-90.

Wyler, A. R., Masuda, M., & Holmes, T. H. (1968). Seriousness of illness rating scale. Journal of Psychosomatic Research, 11, 363-374.

Wyler, A. R., Masuda, M., & Holmes, T. H. (1970). The seriousness of illness rating scale: Reproducibility. Journal of Psychosomatic Research, 14, 59-64.

Wyler, A. R., Masuda, M., & Holmes, T. H. (1971). Magnitude of life events and seriousness of illness. Psychosomatic Medicine, 33, 115-122.

Zarski, J. J. (1984). Hassles and health: A replication. Health Psychology, 3(3), 243-251.

Zeiss, A. M. (1980) Aversiveness vs. change in the assessment of life stress. Journal of Psychosomatic Research, 24, 15-19.

Zimmerman, M. (1983). Methodological issues in the assessment of life events: A review of issues and research. Clinical Psychology Review, 3, 339-370.

Zimmerman, M., O'Hara, M. W., & Corenthal, C. P. (1984). Symptom contamination of life event scales. Health Psychology, 3(1), 77-81.

TABLES

Table 1. Nonredundant intercorrelations[a] between the various illness measures and the MCSDS

Illness measures	Illness measures: Time 1 BDI	Time 1 LPIS	Time 1 SIRS	Time 2 BDI	Time 2 LPIS	Time 2 SIRS	MCSDS
Time 1							
BDI		.62**	.36**	.67**	.56**	.34**	-.21**
LPIS			.42**	.45**	.66**	.43**	-.18**
SIRS				.25**	.32**	.63**	-.24**
Time 2							
BDI					.69**	.35**	-.11*
LPIS						.42**	-.10
SIRS							-.21**

[a]Of the 21 correlations presented, 20 or 95% are significant at $p < .05$ or less.

*$r \geq .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 2. Correlations[a] between life stress and the MCSDS and various illness measures for each time period

Life stress	Time 1			Time 2			
	BDI	LPIS	SIRS	BDI	LPIS	SIRS	MCSDS
Time 1							
0-6 month positive	-.02	-.05	.18**	.00	-.04	.09	-.01
0-6 month negative	.38**	.36**	.37**	.27**	.29**	(.33**)[b]	-.19**
0-6 month total	.25**	.21**	.36**	.19**	.17**	.30**	-.13*
7-12 month positive	.05	-.10	.17**	(.12*)	(.05)	.09	.07
7-12 month negative	.31**	.19**	.28**	.27**	(.22**)	.18**	-.10
7-12 month total	.22**	.06	.27**	(.23**)	(.17**)	.16**	-.03
0-12 month positive	.02	-.09	.22**	.06	-.00	.12*	.02
0-12 month negative	.42**	.35**	.40**	.32**	(.31**)	.32**	-.18**
0-12 month total	.30**	.19**	.40**	.25**	(.21**)	.30**	-.11
Time 2							
Positive	.12*	.07	.20**	.05	.04	.15*	-.04
Negative	.35**	.34**	.28**	(.52**)	(.46**)	(.33**)	-.12*
Total	.31**	.29**	.31**	(.39**)	(.35**)	(.31**)	-.11

[a]Of the 84 correlations presented, 59 or 70% were significant at $p < .05$ or less.

[b]Prospective correlations that were still significant after time 1 illness was partialled out are in parentheses.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 3. Descriptive statistics for the anticipated stress measure by category of anticipated events[a]

	Means	(s.d.)	Means	(s.d.)
	Academics (n = 302)		Work (n = 190)	
Positive anticipated[b] stress	1.90	(.69)	1.89	(.77)
Negative anticipated stress	1.67	(.71)	1.70	(.81)
Total anticipated stress	1.71	(.71)	1.83	(.78)
Relative anticipated stress	4.97	(1.35)	4.04	(1.54)
Stress anticipation	4.99	(1.44)	3.99	(1.63)
Control of anticipated stress	4.94	(1.66)	4.47	(1.51)
	Family/interpersonal relationships (n = 214)		Health (n = 144)	
Positive anticipated stress	2.04	(.83)	2.17	(.81)
Negative anticipated stress	1.97	(.80)	1.89	(.81)
Total anticipated stress	2.00	(.81)	1.98	(.81)
Relative anticipated stress	4.49	(1.78)	4.48	(1.77)
Stress anticipation	4.34	(1.87)	4.23	(1.79)
Control of anticipated stress	3.96	(1.90)	4.02	(2.17)

[a] The sample size for each of the categories of anticipated stress differed because some subjects anticipated stress in only one or two categories, whereas other subjects anticipated stress in four or five categories.

[b] Positive, negative, and total anticipated stress are on a 3-point scale; relative stress, stress anticipation, and control of stress are on a 7-point scale.

Table 3. Continued

	Means	(s.d.)	Means	(s.d.)
	Other (n = 133)			
Positive anticipated stress	2.12	(.73)		
Negative anticipated stress	1.79	(.77)		
Total anticipated stress	1.92	(.77)		
Relative anticipated stress	4.81	(1.61)		
Stress anticipation	4.82	(1.65)		
Control of anticipated stress	4.28	(1.90)		

Table 4. Correlations[a] between anticipated stress and the various illness measures

Anticipated stress	Time 2 — Illness measures		
	BDI	LPIS	SIRS
Time 1			
Positive anticipated stress	-.04	-.07	-.02
Negative anticipated stress	.24**	.27**	.26**
Total anticipated stress	.19**	.19**	.22**
Anticipated relative stress	.06	.08	(.23**)[b]
Stress anticipation	.07	.13*	.16*

[a]Of the 15 correlations presented, 9 or 60% were significant at $p < .05$ or less.

[b]Correlations that were still significant after the effects of life stress and illness present at time 1 were deleted are in parentheses.

*$r > .11$ is significant at the .05 level.

**$r > .16$ is significant at the .01 level.

Table 5. Nonredundant intercorrelations[a] between all measures of anticipated stress and the MCSDS

Anticipated stress	MCSDS	Anticipated stress: Time 1 Pos. ant. sts.	Neg. ant. sts.	Tot. ant. sts.	Rel. ant. sts.	Sts. ant.	# ant. event	Time 2[b] Pos. ant. sts.	Neg. ant. sts.	Tot. ant. sts.	Rel. ant. sts.	# ant. event
Time 1												
Positive anticipated	.02											
Negative anticipated	-.12*	-.37**										
Total anticipated	-.09	.53**	.59**									
Relative anticipated	-.00	-.16**	.24**	.08								
Stress anticipation	-.01	-.17**	.14*	-.02	.63**							
# anticipated events	-.12*	.40**	.46**	.76**	-.04	-.12*						
Time 2												
Positive anticipated	-.00	.51**	-.26**	.21**	-.12*	.07	.29**					
Negative anticipated	-.10	-.19**	.62**	.40**	.15*	.08	.39**	-.28**				

Total anticipated	-.08	.27**	.30**	.51**	.03	.01	.57**	.61**	.59**		
Relative anticipated	.05	-.09	.28**	.18**	.41**	.28**	.03	-.17**	.35**	.16**	
# anticipated events	-.16**	.25**	.27**	.46**	-.03	-.01	.64**	.47**	.50**	.81**	.03

[a]Of the 66 correlations presented, 46 or 70% are significant at $p < .05$ or less.

[b]For anticipated stress time 2, subjects were asked to rate those events they anticipated at time 1 that actually occurred between time 1 and time 2.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 6. Nonredundant intercorrelations[a] between the attributional style dimensions and perceptions of control of hypothetical events from both time periods

Attributions	Time 1 Int.	Time 1 Sta.	Time 1 Glo.	Time 1 Con.	Time 2 Int.	Time 2 Sta.	Time 2 Glo.	Time 2 Con.
Time 1			Positive attributions[b]					
Internality		.54**	.36**	.59**	.47**	.41**	.28**	.34**
Stability			.44**	.55**	.28**	.59**	.32**	.34**
Globality				.47**	.14*	.27**	.44**	.19**
Controllability					.38**	.42**	.34**	.49**
Time 2								
Internality						.54**	.39**	.68**
Stability							.53**	.51**
Globality								.43**
Controllability								
Time 1			Negative attributions					
Internality		.27**	.23**	.43**	.48**	.09	.13*	.36**
Stability			.44**	-.06	.11*	.51**	.22**	-.01
Globality				.12*	.07	.26**	.48**	.09
Controllability					.27**	-.08	.14*	.47**
Time 2								
Internality						.21**	.35**	.63**
Stability							.46**	.04
Globality								.35**
Controllability								

[a]Of the 84 correlations presented, 74 or 88% were significant at $p < .05$ or less.

[b]Positive attributions were used when positive life stress was used in analyses, negative attributions when negative life stress was used, and total attributions when total life stress was used.

*$r \geq .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 6. Continued

Attributions	Time 1 Int.	Time 1 Sta.	Time 1 Glo.	Time 1 Con.	Time 2 Int.	Time 2 Sta.	Time 2 Glo.	Time 2 Con.
Time 1			Total attributions					
Internality		.29**	.21**	.47**	.45**	.14*	.14*	.32**
Stability			.36**	.17**	.08	.54**	.23**	.08
Globality				.26**	.10	.27**	.53**	.15*
Controllability					.29**	.11*	.26**	.52**
Time 2								
Internality						.28**	.34**	.59**
Stability							.45**	.18**
Globality								.39**
Controllability								

Table 7. Overall time 1 regression effects (R-squares)[a] for positive, negative, and total life stress, the various illness measures, and the attributional styles

Life stress and attributional style	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Positive life stress						
Internality	.02[b]	.01	(.06)	.03	.02	(.06)
Stability	.01	.01	(.06)	.01	.01	(.05)
Globality	.00	.02	(.06)	.01	.01	.03
Negative life stress						
Internality	(.19)	(.13)	(.15)	(.11)	(.10)	(.11)
Stability	(.25)	(.18)	(.16)	(.13)	(.12)	(.12)
Globality	(.20)	(.15)	(.19)	(.11)	(.11)	(.12)
Total life stress						
Internality	(.08)	(.04)	(.16)	(.07)	(.05)	(.10)
Stability	(.11)	(.08)	(.17)	(.07)	(.05)	(.11)
Globality	(.10)	(.07)	(.18)	(.06)	(.06)	(.11)

[a]Of the 54 R-square values presented, 41 or 76% are significant at $p < .05$ or less.

[b]All values which are significant at the .01 level or less are in parentheses.

Table 8. Overall time 2 regression effects (R-squares)[a] for positive, negative, and total life stress, the various illness measures, and the attributional styles

Life stress and attributional style	Time 2 — Illness measures		
	BDI	LPIS	SIRS
Positive life stress			
Internality	.01[b]	.02	.03
Stability	.03	.02	(.05)
Globality	.00	.00	.03
Negative life stress			
Internality	(.28)	(.21)	(.11)
Stability	(.28)	(.23)	(.11)
Globality	(.29)	(.23)	(.12)
Total life stress			
Internality	(.16)	(.12)	(.10)
Stability	(.16)	(.13)	(.10)
Globality	(.16)	(.13)	(.10)

[a]Of the 27 R-square values presented, 19 or 70% are significant at $p < .05$ or less.

[b]All values which are significant at the .01 level or less are in parentheses.

Table 9. Experienced and anticipated life stress-illness correlations and their moderation by attribution variables[a]

Types of life stress	Illness measure	Correlations for all levels of an attribution tion variable	Moderating attribution variable	Correlations for contrasting levels of an attribution variable	
				High	Low
Negative (time 1)	LPIS (time 1)	.35**	Stability	.28**	.38**
Negative (time 1)	SIRS (time 2)	.32**	Stability	.25**	.39**
Positive (time 2)	SIRS (time 2)	.15*	Stability	.10	.24**
Total (time 1)	SIRS (time 2)	.30**	Stability	.23**	.38**
Total (time 1)	LPIS (time 1)	.19**	Stability	.12	.23**
Total (time 1)	SIRS (time 1)	.40**	Stability	.36**	.44**
Total (time 1)	LPIS (time 1)	.19**	Globality	.05	.29**
Negative anticipated stress	SIRS (time 2)	.24**	Stability	.17*	.46**

[a]Table includes only those attribution variables which were found by regression analysis to have statistically significant effects.

*r > .12 is significant at the .05 level.
**r ≥ .16 is significant at the .01 level. (For all levels of an attribution variable.)

*r > .16 is significant at the .05 level.
**r > .20 is significant at the .01 level (For contrasting levels of an attribution variable.)

Table 10. Overall regression effects (R-square)[a] for anticipated stress, the various illness measures (time 2), and the attributional styles (time 1)

Anticipated stress and attributional styles	Time 2 — illness measures		
	BDI	LPIS	SIRS
Positive anticipated stress			
Internality	(.03)[b]	(.03)	.02
Stability	.01	.01	.01
Globality	.00	.01	.01
Negative anticipated stress			
Internality	(.08)	(.07)	(.07)
Stability	(.08)	(.10)	(.13)
Globality	(.06)	(.08)	(.08)
Total anticipated stress			
Internality	(.04)	(.04)	(.05)
Stability	(.04)	(.04)	(.06)
Globality	(.04)	(.05)	(.07)
Relative anticipated stress			
Internality	.01	.01	(.06)
Stability	.02	.02	(.06)
Globality	.02	(.03)	(.08)
Stress anticipation			
Internality	.01	.02	.03
Stability	.01	(.03)	(.04)
Globality	.01	(.04)	(.06)

[a]Of the 45 R-square values presented, 28 or 62% are significant at $p < .05$ or less.

[b]All values that are significant at the .05 level or less are in parentheses. All values > .03 are also significant at the .01 level.

Table 11. Correlations[a] between experienced and anticipated life stress and the attributional variables from both time periods

Life stress	Internality	Stability	Globality
Time 1	Time 1 — Attributional variables		
Positive[b] experienced	.15**	.27**	.31**
Negative experienced	.10	.19**	.23**
Total experienced	.12*	.20**	.29**
Positive anticipated	.05	-.01	.07
Negative anticipated	.05	.21**	.21**
Total anticipated	.07	.10	.18**
Relative anticipated	.13*	.15**	.19**
Stress anticipation	.10	.14*	.09
Time 2	Time 2 — Attributional variables		
Positive experienced	-.01	.14*	.08
Negative experienced	.17**	-.01	.15**
Total experienced	.07	.02	.13*

[a]Of the 33 correlations presented, 19 or 58% were significant at $p < .05$ or less.

[b]Ratings of positive events from the ASQ were used in correlations with positive life stress, whereas ratings of negative events from the ASQ were used in correlations with negative life stress.

*$r > .11$ is significant at the .05 level.

**$r \geq .15$ is significant at the .01 level.

Table 12. Correlations[a] between attributional style and the MCSDS and the various illness measures for each time period

	Illness measures						
	Time 1			Time 2			
Attributions	BDI	LPIS	SIRS	BDI	LPIS	SIRS	MCSDS
Time 1							
Internality[b]							
Positive	-.14*	-.06	-.10	-.15*	-.14*	-.15**	.08
Negative	.15*	.11	.07	.15*	.05	.08	-.04
Total	.03	.05	-.00	.02	-.05	-.03	.02
Stability							
Positive	-.07	-.00	-.04	-.07	-.06	-.12*	.17**
Negative	.34**	.27**	.14*	.20**	.21**	.11*	-.26**
Total	.19**	.19**	.07	.10	.11	-.01	-.07
Globality							
Positive	.02	.07	.11*	-.00	.06	.11*	.04
Negative	.25**	.23**	.25**	.12*	.16**	.19**	-.20**
Total	.19**	.20**	.24**	.08	.15*	.19**	-.12*
Time 2							
Internality							
Positive	-.05	-.02	-.05	-.10	-.12*	-.06	.01
Negative	.18**	.13*	.13*	.17**	.11	.12*	-.04
Total	.10	.09	.07	.06	.01	.05	-.03
Stability							
Positive	-.06	-.03	-.04	-.12*	-.13*	-.09	.08
Negative	.21**	.14*	.11	.11	.11	.08	-.14*
Total	.11	.09	.05	-.00	-.01	-.01	-.04
Globality							
Positive	.00	.03	.01	-.02	.00	-.02	.01
Negative	.24**	.21**	.17**	.21**	.21**	.18**	-.10
Total	.16**	.16**	.12*	.13*	.14*	.11	-.06

[a]Of the 126 correlations presented, 54 or 43% are significant at $p < .05$ or less.

[b]Attributions for positive events on the ASQ were used when positive life stress was used in analyses, attributions for negative events on the ASQ were used when negative life stress was used, and attributions for all events on the ASQ were used when total life stress was used.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 13. Overall regression effects (R-squares)[a] for uncontrollable positive and uncontrollable negative life stress, attributional styles, and the various illness measures

Uncontrollable life stress and attributional style	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1 — Positive						
Internality	(.03)[b]	.01	.02	.02	.02	.02
Stability	.01	.01	.01	.00	.01	.02
Globality	.02	.01	(.03)	.00	.00	.02
Time 2 — Positive						
Internality	—	—	—	.01	.01	.01
Stability	—	—	—	.02	.02	.01
Globality	—	—	—	.01	.00	.00
Time 1 — Negative						
Internality	(.13)	(.09)	(.08)	(.11)	(.07)	(.06)
Stability	(.19)	(.12)	(.07)	(.09)	(.09)	(.06)
Globality	(.13)	(.10)	(.12)	(.07)	(.08)	(.08)
Time 2 — Negative						
Internality	—	—	—	(.16)	(.14)	(.04)
Stability	—	—	—	(.15)	(.14)	(.03)
Globality	—	—	—	(.17)	(.17)	(.06)

[a]Of the 54 R-square values presented, 29 or 54% are significant at $p < .05$ or less.

[b]All values significant at the .05 level or less are in parentheses. All values $\geq .04$ are also significant at the .01 level.

Table 14. Overall regression effects (R-squares)[a] for controllable positive and controllable negative life stress, attributional styles, and the various illness measures

Controllable life stress and attributional style	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1 — Positive						
Internality	(.03)[b]	.02	(.05)	(.03)	.02	(.03)
Stability	.01	.01	.03	.01	.00	.02
Globality	.01	.02	(.04)	.00	.01	.02
Time 2 — Positive						
Internality	—	—	—	.01	.01	.01
Stability	—	—	—	.00	.00	.01
Globality	—	—	—	(.03)	(.03)	.01
Time 1 — Negative						
Internality	(.06)	.02	(.04)	(.06)	.02	.02
Stability	(.15)	(.08)	(.06)	(.07)	(.07)	(.04)
Globality	(.08)	(.07)	(.10)	(.05)	(.05)	(.05)
Time 2 — Negative						
Internality	—	—	—	(.05)	(.03)	(.03)
Stability	—	—	—	(.04)	(.03)	(.03)
Globality	—	—	—	(.07)	(.06)	(.05)

[a]Of the 54 R-square values presented, 31 or 57% are significant at $p < .05$ or less.

[b]All values which are significant at the .05 level or less are in parentheses. All values $\geq .04$ are also significant at the .01 level.

Table 15. Uncontrollable and controllable life stress-illness correlations and their moderation by attribution variables[a]

Type of life stress	Illness measure	Correlations for all levels of an attribution variable	Moderating attribution variable	Correlations for contrasting levels of an attribution variable	
				High	Low
Uncontrollable negative (time 1)	BDI (time 1)	.31**	Stability	.35**	.18*
Uncontrollable negative (time 1)	LPIS (time 2)	.23**	Internality	.29**	.19*
Uncontrollable negative (time 1)	BDI (time 2)	.24**	Internality	.30**	.20*
Controllable negative (time 1)	SIRS (time 2)	.13*	Stability	.09	.19*

[a]Table includes only those attribution variables which were found by regression analysis to have statistically significant effects.

*$r \geq .11$ is significant at the .05 level.
**$r \geq .16$ is significant at the .01 level. (For all levels of an attribution variable.)

*$r > .16$ is significant at the .05 level.
**$r > .20$ is significant at the .01 level. (For contrasting levels of an attribution variable.)

Table 16. Overall regression effects (R-square)[a] for positive, negative, and total life stress, experienced and hypothetical perceptions of control, and the various illness measures

Life stress and perceptions of control	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Positive life stress						
Experienced control[b]	.00[c]	.01	(.05)	.01	.00	(.03)
Hypothetical control	.01	.01	(.06)	.02	.02	(.06)
Negative life stress						
Experienced control	(.19)	(.13)	(.16)	(.10)	(.10)	(.11)
Hypothetical control	(.18)	(.13)	(.15)	(.10)	(.11)	(.12)
Total life stress						
Experienced control	(.11)	(.08)	(.16)	(.07)	(.06)	(.11)
Hypothetical control	(.11)	(.04)	(.16)	(.07)	(.07)	(.12)
Time 2						
Positive life stress						
Experienced control	—	—	—	(.03)	.02	(.04)
Hypothetical control	—	—	—	(.04)	(.03)	(.05)
Negative life stress						
Experienced control	—	—	—	(.27)	(.22)	(.11)
Hypothetical control	—	—	—	(.27)	(.21)	(.10)
Total life stress						
Experienced control	—	—	—	(.21)	(.18)	(.11)
Hypothetical control	—	—	—	(.16)	(.13)	(.10)

[a]Of the 54 R-square values presented, 45 or 83% were significant at $p < .05$ or less.

[b]Experienced perceptions of control are taken from ratings from the LES; hypothetical perceptions of control are taken from ratings from the ASQ. Ratings of experienced perceptions of control may be confounded in that different subjects experienced different life events. Some events may actually be under the control of the subject; thus, the ratings do not simply reflect the individual perceptions of control of that subject.

[c]All values which are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 17. Life stress-illness correlations and their moderation by perception of control[a]

Type of life stress	Illness measure	Correlations for all levels of perception of control	Moderating perception of control for types of life events	Correlations for contrasting levels of perception of control	
				High	Low
Total (time 1)	SIRS (time 2)	.30**	Experienced[b]-Total	.17*	.42**
Positive (time 2)	BDI (time 2)	.05	Experienced-Positive	-.01	.16
Positive (time 2)	LPIS (time 2)	.04	Experienced-Positive	.02	.17*
Negative (time 2)	LPIS (time 2)	.46**	Experienced-Negative	.40**	.50**
Total (time 2)	BDI (time 2)	.39**	Experienced-Total	.29**	.49**
Total (time 2)	LPIS (time 2)	.35**	Experienced-Total	.23**	.48**
Positive (time 1)	SIRS (time 2)	.14*	Hypothetical-Positive	.17*	.17*[c]
Negative (time 1)	SIRS (time 2)	.32**	Hypothetical-Negative	.33**	.31**
Anticipated positive	SIRS (time 2)	-.02	Experienced-Positive	-.07	.03

[a]Table includes only those perception of control variables which were found by regression analyses to have statistically significant effects.

[b]Experienced perceptions of control come from ratings from the LES (i.e., perceptions of control of positive, negative, or total life stress events). Hypothetical perceptions of control come from ratings from the ASQ.

[c]Higher when not rounded.

*$r \geq .11$ is significant at the .05 level.
**$r \geq .16$ is significant at the .01 level. (For all levels of perception of control.)

*$r > .16$ is significant at the .05 level.
**$r > .20$ is significant at the .01 level. (For contrasting levels of perception of control.)

Table 18. Overall regression effects (R-square)[a] for positive, negative, total, and relative anticipated stress, and stress anticipation, experienced, hypothetical, and anticipated perceptions of control and the various illness measures

Anticipated stress and perceptions of control	Time 2 — Illness measures		
	BDI	LPIS	SIRS
Positive anticipated stress			
Experienced control	.00[b]	.02	.02
Hypothetical control	.02	.02	.02
Anticipated control	.00	.01	.00
Negative anticipated stress			
Experienced control	(.06)	(.07)	(.07)
Hypothetical control	(.06)	(.07)	(.07)
Anticipated control	(.06)	(.07)	(.07)
Total anticipated stress			
Experienced control	(.04)	(.05)	(.06)
Hypothetical control	(.04)	(.05)	(.06)
Anticipated control	(.04)	(.04)	(.05)
Relative anticipated stress			
Experienced control	.01	(.03)	(.07)
Hypothetical control	.01	.02	(.07)
Anticipated control	.01	.01	(.06)
Stress anticipation			
Experienced control	.01	(.04)	(.03)
Hypothetical control	.01	(.03)	(.04)
Anticipated control	.01	.02	(.03)

[a]Of the 45 R-square values presented, 27 or 60% are significant at $p < .05$ or less.

[b]All values that are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 19. Correlations[a] between positive, negative, and total life stress and perceptions of control of experienced and hypothetical events

Life stress	Hypothetical events[b]	Experienced events[c]
Time 1	Perceptions of control — Time 1	
Positive	.23**	.18**
Negative	.07	.10
Total	.17**	-.02
Time 2	Perceptions of control — Time 2	
Positive	.04	.47**
Negative	.04	.29**
Total	.02	.13*

[a]Of the 12 correlations presented, 6 or 50% are significant at $p < .05$ or less.

[b]Perceptions of control taken from the ASQ (hypothetical events).

[c]Perceptions of control taken from the LES (experienced events).

*$r \geq .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 20. Correlations[a] between experienced and hypothetical perceptions of control and the various illness measures from both time periods

Perceptions of control of positive, negative, and total life stress events	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Hypothetical[b] perception of control						
Positive	-.12**	-.00	-.04	-.11	-.10	-.13*
Negative	-.05	.00	-.02	.01	-.04	-.01
Total	-.10	-.00	-.04	-.05	-.09	-.09
Experienced perception of control						
Positive	-.03	-.08	.01	-.03	-.03	.02
Negative	.06	.00	.08	.02	.02	.01
Total	-.15*	-.20**	-.07	-.07	-.13*	-.08
Time 2						
Hypothetical perception of control						
Positive	-.13*	-.03	-.10	-.20**	-.16**	-.14*
Negative	.08	.06	.03	.07	.04	.00
Total	-.02	.02	-.04	-.08	-.07	-.08
Experienced perception of control						
Positive	.00	-.02	.07	.02	-.02	-.00
Negative	.15*	.10	.04	.15*	.14*	.09
Total	-.03	-.06	-.04	-.08	-.09	-.06

[a]Of the 72 correlations presented, 12 or 17% are significant at $p < .05$ or less.

[b]Hypothetical perceptions of control are taken from ratings from the ASQ. Experienced perceptions of control are taken from ratings from the LES.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 21. Correlations[a] between controllable and uncontrollable positive and negative life stress and the illness variables from both time periods

Life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Uncontrollable Negative	.31**	.27**	.26**	.24**	.23**	.23**
Controllable Negative	.18**	.09	.21**	.16*	.19**	.13*
Uncontrollable Positive	-.03	-.07	.10	.03	.00	-.03
Controllable Positive	-.04	-.11	.16**	-.03	.02	.05
Time 2						
Uncontrollable Negative	.21**	.27**	.15*	.37**	.36**	.16*
Controllable Negative	.11*	.14*	.14*	.17**	.13*	.16*
Uncontrollable Positive	.03	.05	.06	.06	.00	.04
Controllable Positive	-.02	-.03	.10	-.04	-.05	.05

[a]Of the 48 correlations presented, 24 or 50% were significant at $p < .05$ or less.

*$r > .11$ is significant at the .05 level.

**$r > .16$ is significant at the .01 level.

Table 22. Descriptive statistics for the Comprehensive Social Support Measure — average amount, satisfaction with, and availability of social support by category of supporter[a]

Category of supporter	Amount		Satisfaction		Availability	
	Mean	(s.d.)	Mean	(s.d.)	Mean	(s.d.)
Parent n = 458	4.29	(.90)	4.05	(1.03)	4.12	(.99)
Sibling n = 278	3.97	(.95)	3.87	(1.00)	3.65	(1.19)
Friend n = 1374	3.85	(.94)	3.77	(1.04)	3.98	(1.15)
Other relative n = 115	4.05	(.89)	4.06	(.93)	3.56	(1.22)
Other[b] n = 78	3.74	(.97)	3.86	(1.08)	3.64	(1.15)

[a]Range of number of supporters was 1 to 15. Each supporter fell into one of the five categories. The unequal sample size is due to the fact that the supporters students had came from one category (e.g., friend) more than other categories (e.g., other relative).

[b]Other equals boss, counselor, coach, minister, coworker, etc.

Table 23. Overall regression coefficients (R-squares)[a] for positive, negative, and total life stress, stable frequency of support[b], and the various illness measures

Social support and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Positive life stress	.01[c]	.02	(.10)	.02	.01	(.11)
Negative life stress	(.15)	(.10)	(.16)	(.11)	(.08)	(.18)
Total life stress	(.09)	(.05)	(.17)	(.09)	(.04)	(.17)
Time 2						
Positive life stress	—	—	—	.03	.02	(.12)
Negative life stress	—	—	—	(.27)	(.20)	(.19)
Total life stress	—	—	—	(.17)	(.11)	(.18)

[a]Of the 27 R-square values presented, 21 or 78% are significant at $p < .05$ or less.

[b]Stable frequency of support is taken from the ISSB.

[c]All values which are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 24. Overall regression effects (R-squares)[a] for positive, negative, and total life stress, stable number of helpers[b], and the various illness measures

Number of helpers and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Positive life stress	.02[c]	.01	(.06)	.02	.01	.03
Negative life stress	(.19)	(.13)	(.19)	(.12)	(.09)	(.10)
Total life stress	(.11)	(.04)	(.18)	(.10)	(.06)	(.10)
Time 2						
Positive life stress	—	—	—	.01	.01	.03
Negative life stress	—	—	—	(.22)	(.18)	(.10)
Total life stress	—	—	—	(.15)	(.11)	(.10)

[a]Of the 27 R-square values presented, 19 or 70% are significant at $p < .05$ or less.

[b]Stable number of helpers is taken from the CSSM.

[c]All values which are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 25. Overall regression effects (R-squares)[a] for positive, negative, and total life stress, stable amount of support[b], and the various illness measures

Amount of social support and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Positive life stress	.00[c]	.01	(.05)	.01	.01	.01
Negative life stress	(.16)	(.11)	(.14)	(.10)	(.10)	(.10)
Total life stress	(.09)	(.03)	(.15)	(.06)	(.04)	(.08)
Time 2						
Positive life stress	—	—	—	.00	.00	.03
Negative life stress	—	—	—	(.25)	(.21)	(.12)
Total life stress	—	—	—	(.13)	(.12)	(.11)

[a]Of the 27 R-square values presented, 19 or 70% are significant at $p < .05$ or less.

[b]Stable amount of support is taken from the CSSM.

[c]All values which are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 26. Life stress-illness correlations and their moderation by stable frequency of support[a]

Type of life stress	Illness measure	Correlations for all levels of frequency of support	Frequency of support (FOS) moderating variable	Correlations for contrasting levels of frequency of support	
				High	Low
Total (time 1)	BDI (time 1)	.30**	FOS (time 1)	.46**	.08
Total (time 1)	LPIS (time 1)	.19**	FOS (time 1)	.31**	-.03
Negative (time 1)	BDI (time 2)	.32**	FOS (time 1)	.40**	.11
Total (time 1)	BDI (time 2)	.25**	FOS (time 1)	.36**	.07
Positive (time 2)	LPIS (time 2)	.04	FOS (time 2)	.09	-.08
Positive (time 2)	SIRS (time 2)	.15*	FOS (time 2)	.25**	-.02
Negative (time 2)	BDI (time 2)	.52**	FOS (time 2)	.56**	.45**
Negative (time 2)	LPIS (time 2)	.46**	FOS (time 2)	.48**	.37**
Negative (time 2)	SIRS (time 2)	.33**	FOS (time 2)	.41**	.26**
Total (time 2)	BDI (time 2)	.39**	FOS (time 2)	.43**	.35**
Total (time 2)	LPIS (time 2)	.35**	FOS (time 2)	.37**	.24**
Total (time 2)	SIRS (time 2)	.31**	FOS (time 2)	.40**	.18*

[a]Table includes only those frequency of support variables which were found by regression analysis to have statistically significant effects.

*$r > .11$ is significant at the .05 level.
**$r > .16$ is significant at the .01 level. (For all levels of frequency of support.)

*$r \geq .17$ is significant at the .05 level.
**$r \geq .21$ is significant at the .01 level. (For contrasting levels of frequency of support.)

Table 27. Life stress-illness correlations and their moderation by stable number of helpers, stable amount of support, and satisfaction with support[a]

Type of life stress	Illness measure	Correlations for all levels of the moderating variable	Moderating variable	Correlations for contrasting levels of number of helpers, amount of support or satisfaction with support	
				High	Low
Positive (time 1)	BDI (time 1)	.02	Number of helpers (time 1)	.17	-.06
Total (time 1)	BDI (time 1)	.30**	Number of helpers (time 1)	.46**	.21*
Total (time 1)	LPIS (time 2)	.21**	Number of helpers (time 1)	.30**	.07
Negative (time 1)	BDI (time 2)	.32**	Amount of support	.38**	.11
Negative (time 1)	LPIS (time 2)	.31**	Amount of support	.40**	.17
Negative (time 1)	LPIS (time 1)	.35**	Satisfaction with support (time 1)	.30**	.42**
Negative (time 2)	SIRS (time 2)	.33**	Satisfaction with support (time 2)	.31**	.36**

[a]Table includes only those social support variables (e.g., satisfaction with support or number of helpers) which were found by regression analyses to have statistically significant effects.

*r > .11 is significant at the .05 level.
**r $\geq$ .16 is significant at the .01 level. (For all levels of the moderating variables.)

*r > .17 is significant at the .05 level.
**r > .21 is significant at the .01 level. (For contrasting levels of the moderating variables.)

Table 28. Overall regression effects (R-squares)[a] for positive, negative, and total life stress, satisfaction with support[b], and the various illness measures

Satisfaction with support and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Positive life stress	.02[c]	.02	(.05)	(.03)	(.03)	.02
Negative life stress	(.20)	(.14)	(.15)	(.12)	(.13)	(.10)
Total life stress	(.11)	(.05)	(.16)	(.09)	(.08)	(.09)
Time 2						
Positive life stress	—	—	—	(.03)	(.04)	(.03)
Negative life stress	—	—	—	(.27)	(.23)	(.13)
Total life stress	—	—	—	(.17)	(.15)	(.12)

[a]Of the 27 R-square values presented, 24 or 89% are significant at $p < .05$ or less.

[b]Satisfaction with support ratings are taken from the CSSM.

[c]All values which are significant at the .05 level or less are in parentheses. All values > .04 are also significant at the .01 level.

Table 29. Nonredundant intercorrelations[a] between frequency of, amount of, satisfaction with, and availability of social support and number of helpers

Social support	Social support[b]									
	Time 1					Time 2				
	Amnt. of	Sat. with	Avail. of	# of help.	Freq. of	Amnt. of	Sat. with	Avail. of	# of help.	Freq. of
Time 1										
Amount of		.55**	.24**	.01	.18**	.47**	.31**	.21**	.07	.12*
Satisfaction with			.28**	.04	.14**	.33**	.46**	.21**	.08	.11
Availability of				-.05	-.03	.17**	.16**	.43**	-.04	-.08
# of helpers					.22**	.04	.11	.03	.64**	.17**
Frequency of						.13*	.16**	-.06	.21**	.64**
Time 2										
Amount of							.64**	.29**	-.08	.21**
Satisfaction with								.28**	.08	.21**
Availability of									-.03	-.04
# of helpers										.16**
Frequency of										

[a]Of the 45 correlations presented, 28 or 62% are significant at $p < .05$ or less.

[b]Frequency of support is taken from ratings from the ISSB. All other support measures are taken from ratings from the CSSM.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 30. Overall time 1 regression effects (R-squares)[a] for positive, negative, and total life stress, the various illness measures, and the types of social support

Types of social support and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Attachment						
Positive	(.07)[b]	(.06)	(.05)	(.03)	(.04)	(.03)
Negative	(.23)	(.18)	(.16)	(.12)	(.13)	(.11)
Total	(.16)	(.10)	(.16)	(.09)	(.09)	(.09)
Social integration						
Positive	(.09)	(.07)	(.05)	(.04)	(.04)	.02
Negative	(.24)	(.19)	(.17)	(.12)	(.13)	(.12)
Total	(.17)	(.11)	(.17)	(.10)	(.09)	(.10)
Reassurance/worth						
Positive	(.12)	(.11)	(.06)	(.10)	(.09)	(.03)
Negative	(.25)	(.21)	(.17)	(.17)	(.16)	(.13)
Total	(.19)	(.14)	(.18)	(.15)	(.12)	(.11)
Reliable alliance						
Positive	(.05)	(.05)	(.05)	(.03)	(.04)	.02
Negative	(.22)	(.18)	(.17)	(.12)	(.13)	(.12)
Total	(.14)	(.09)	(.17)	(.09)	(.09)	(.10)
Guidance						
Positive	(.04)	(.06)	(.05)	.02	(.03)	(.03)
Negative	(.21)	(.17)	(.16)	(.11)	(.12)	(.11)
Total	(.12)	(.09)	(.16)	(.07)	(.08)	(.09)
Opportunity/nurturance						
Positive	.01	.02	(.06)	.01	.00	.02
Negative	(.20)	(.17)	(.18)	(.10)	(.12)	(.13)
Total	(.11)	(.07)	(.19)	(.06)	(.06)	(.11)

[a]Of the 108 R-square values presented, 100 or 93% are significant at $p < .05$ or less.

[b]All values which are significant at the .05 level are in parentheses. All values > .04 are also significant at the .01 level.

Table 31. Overall time 2 regression effects (R-squares)[a] for positive, negative, and total life stress, the various illness measures, and the types of social support

Type of social support and life stress	Illness measures, Time 2		
	BDI	LPIS	SIRS
Attachment			
Positive	(.07)[b]	(.08)	.03
Negative	(.30)	(.24)	(.12)
Total	(.21)	(.18)	(.10)
Social integration			
Positive	(.08)	(.05)	(.03)
Negative	(.31)	(.24)	(.11)
Total	(.21)	(.16)	(.10)
Reassurance/worth			
Positive	(.13)	(.15)	(.05)
Negative	(.31)	(.27)	(.11)
Total	(.23)	(.22)	(.11)
Reliable alliance			
Positive	(.07)	(.08)	(.03)
Negative	(.29)	(.24)	(.11)
Total	(.20)	(.17)	(.20)
Guidance			
Positive	(.05)	(.05)	(.03)
Negative	(.29)	(.23)	(.11)
Total	(.19)	(.16)	(.10)
Opportunity/nurturance			
Positive	.01	.01	.03
Negative	(.28)	(.21)	(.12)
Total	(.16)	(.13)	(.11)

[a]Of the 54 R-square values presented, 50 or 93% are significant at $p < .05$ or less.

[b]All values which are significant at the .05 level are in parentheses. Values > .04 are also significant at the .01 level.

Table 32. Life stress-illness correlations and their moderation by types of social support[a]

Type of life stress	Illness measure	Correlations for all levels of types of social support	Moderating[b] variable	Correlations for contrasting levels of types of social support	
				High	Low
Negative (time 1)	LPIS (time 1)	.35**	Attachment	.38**	.30**
Negative (time 1)	LPIS (time 1)	.35**	Social integ.	.42**	.28**
Negative (time 1)	SIRS (time 1)	.40**	Social integ.	.42**	.36**
Total (time 1)	SIRS (time 1)	.40**	Social integ.	.47**	.32**
Negative (time 1)	LPIS (time 1)	.35**	Reas. of worth	.42**	.27**
Negative (time 1)	SIRS (time 1)	.40**	Reas. of worth	.41**	.38**
Total (time 1)	SIRS (time 1)	.40**	Reas. of worth	.43**	.36**
Negative (time 1)	LPIS (time 1)	.35**	Rel. alliance	.43**	.27**
Negative (time 1)	SIRS (time 1)	.40**	Rel. alliance	.44**	.34**
Negative (time 1)	BDI (time 1)	.42**	Opport./nurt.	.52**	.36**
Negative (time 1)	LPIS (time 1)	.35**	Opport./nurt.	.46**	.27**
Negative (time 1)	SIRS (time 1)	.40**	Opport./nurt.	.43**	.35**
Total (time 1)	LPIS (time 1)	.19**	Opport./nurt.	.29**	.12
Total (time 1)	SIRS (time 1)	.40**	Opport./nurt.	.45**	.32**
Negative (time 1)	SIRS (time 2)	.32**	Social integ.	.37**	.26**
Negative (time 1)	SIRS (time 2)	.32**	Reas. of worth	.38**	.26**
Total (time 1)	SIRS (time 2)	.30**	Reas. of worth	.31**	.29**
Negative (time 1)	SIRS (time 2)	.32**	Rel. alliance	.43**	.20*
Negative (time 1)	LPIS (time 2)	.31**	Opport./nurt.	.43**	.23**

Negative (time 1)	SIRS (time 2)	.32**	Opport./nurt.	.43**	.20**
Total (time 1)	LPIS (time 2)	.21**	Opport./nurt.	.34**	.12
Total (time 1)	SIRS (time 2)	.30**	Opport./nurt.	.39**	.20*

[a]Table includes only those types of support which were found by regression analysis to have statistically significant effects.

[b]Types of support include: attachment, social integration, reassurance of worth, reliable alliance, opportunity for nurturance, and guidance.

*$\underline{r}$ > .11 is significant at the .05 level.
**$\underline{r}$ > .16 is significant at the .01 level. (For all levels of types of social support.)

*$\underline{r}$ > .17 is significant at the .05 level.
**$\underline{r}$ > .20 is significant at the .01 level. (For contrasting levels of types of social support.)

Table 33. Nonredundant intercorrelations[a] between types of, frequency of, amount of, satisfaction with, and availability of social support, number of helpers, and the MCSDS

Types of social support	Social support[b]										
	Time 1					Time 2					
	Amnt. of	Sat. with	Avail. of	# of help.	Freq. of	Amnt. of	Sat. with	Avail. of	# of help.	Freq. of	MCSDS
Time 1											
Attachment	.26**	.34**	.15*	.15*	.37**	.23**	.29**	.14*	.11	.30**	.03
Social integration	.24**	.23**	.16**	.24**	.24**	.22**	.21**	.18**	.19**	.18**	.02
Reassurance of worth	.16**	.22**	.11	.20**	.17**	.13*	.22**	.12*	.10	.09	.21**
Reliable alliance	.18**	.19**	.19**	.18**	.26**	.14*	.17**	.21**	.17**	.17**	-.01
Guidance	.18**	.26**	.16**	.23**	.29**	.16**	.21**	.16**	.15*	.22**	.03
Opportunity for nurturance	.20**	.18**	.11	.19**	.37**	.24**	.23**	.09	.14*	.27**	.07
Time 2											
Attachment	.18**	.26**	.04	.10	.23**	.30**	.35**	.16**	.07	.34**	.05
Social integration	.25**	.29**	.11	.13*	.17**	.26**	.27**	.15*	.15*	.23**	-.00
Reassurance of worth	.20**	.19**	.09	.13*	.14*	.20**	.26**	.15*	.13*	.14*	.15*

Reliable alliance	.21**	.29**	.15*	.09	.24**	.22**	.29**	.21**	.19**	.30**	.01
Guidance	.27**	.26**	.08	.10	.30**	.30**	.32**	.13*	.14*	.31**	.01
Opportunity for nurturance	.20**	.16**	.01	.08	.25**	.21**	.20**	.07	.09	.31**	.13*
MCSDS	.10	.14*	-.05	.02	-.05	.08	.09	-.07	.06	-.04	

[a]Of the 142 correlations presented, 106 or 75% are significant at $p < .05$ or less.

[b]Frequency of support ratings are taken from the ISSB. Types of social support are taken from the SPS. All other social support measures are from the CSSM.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 34. Nonredundant intercorrelations[a] between types of social support

Time 2 correlated with Time 2	Types of social support[b]					
	Attach.	Soc. integ.	Reasur. worth	Reliable alliance	Guidance	Opportunity nurturance
			Time 1 correlated with Time 1			
Attachment		.59**	.52**	.58**	.69**	.55**
Social integration	.47**		.57**	.61**	.59**	.54**
Reassurance of worth	.42**	.58**		.55**	.47**	.47**
Reliable alliance	.59**	.57**	.49**		.68**	.46**
Guidance	.65**	.61**	.45**	.72**		.50**
Opportunity for nurturance	.42**	.44**	.39**	.42**	.42**	
			Time 1 correlated with Time 2			
Attachment	.62**	.43**	.39**	.46**	.53**	.38**
Social integration	.39**	.61**	.47**	.41**	.45**	.37**
Reassurance of worth	.30**	.37**	.60**	.32**	.33**	.28**
Reliable alliance	.28**	.39**	.34**	.38**	.42**	.26**
Guidance	.44**	.37**	.25**	.44**	.51**	.29**
Opportunity for nurturance	.37**	.38**	.32**	.32**	.36**	.62**

[a]Of the 66 correlations presented, 66 or 100% are significant at $p < .05$ or less.

[b]Types of support are taken from ratings from the SPS.

**$r > .16$ is significant at the .01 level.

Table 35. Nonredundant correlations[a] between positive, negative, and total life stress, types of, amount of, frequency of, satisfaction with, and availability of social support and number of helpers

Social support[b] (SS)	Life stress					
	Time 1			Time 2		
	Pos.	Neg.	Total	Pos.	Neg.	Total
Time 1						
Attachment	.15*	-.07	.03	.11	-.04	.03
Social integration	.17**	-.10	.02	.04	-.07	-.01
Reassurance/worth	.12*	-.20**	-.07	.01	-.17**	-.12*
Reliable alliance	.15*	-.03	.06	.09	-.01	.04
Guidance	.13*	-.05	.03	.09	-.03	.04
Opportunity/nurturance	.11	-.04	.02	.05	.02	.05
Frequency of SS	.16**	.06	.13*	.09	.07	.09
Amount of SS	.13*	.04	.10	.05	.10	.11
Satisfaction with	.14*	-.02	.06	.12*	-.07	.02
Availability of	-.03	-.10	-.09	-.04	-.05	-.06
# of helpers	.14*	.04	.10	.10	.04	.09

[a]Of the 132 correlations presented, 32 or 24% are significant at $p < .05$ or less.

[b]Types of social support come from ratings from the SPS. Frequency of social support comes from ratings from the ISSB. All other social support ratings are from the CSSM.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 35. Continued

Social Support[b] (SS)	Life stress					
	Time 1			Time 2		
	Pos.	Neg.	Total	Pos.	Neg.	Total
Time 2						
Attachment	.05	-.05	-.00	-.10	-.15*	-.05
Social integration	.05	-.08	-.03	.02	-.15*	-.09
Reassurance/worth	-.00	-.20**	-.14*	-.00	-.31**	-.22**
Reliable alliance	.04	-.11	-.05	.06	-.20**	-.11
Guidance	.09	-.07	-.00	.07	-.10	-.04
Opportunity/nurturance	.08	-.02	.03	.10	-.06	.02
Frequency of SS	.21**	.08	.17**	.20**	.04	.14*
Amount of SS	.06	.04	.06	.03	.01	.03
Satisfaction with	.09	-.01	.05	.04	-.12*	-.06
Availability of	.01	-.03	-.02	.01	-.13*	-.09
# of helpers	.18**	.07	.14*	.21**	.13*	.21**

Table 36. Nonredundant correlations[a] between the three illness measures, types of, amount of, frequency of, satisfaction with, and availability of social support and number of helpers

Social support[b] (SS)	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Attachment	-.25**	-.24**	.01	-.16**	-.21**	.00
Social integration	-.29**	-.25**	.03	-.18**	-.20**	-.05
Reassurance/worth	-.34**	.32**	-.05	-.30**	-.30**	.11
Reliable alliance	-.21**	-.23**	.09	-.14*	-.19**	.01
Guidance	-.17**	-.22**	.04	-.10	-.17**	.00
Opportunity/nurturance	-.12*	-.10	.13	-.03	-.04	.05
Frequency of SS	.02	.07	.18**	.09	.08	.21**
Amount of SS	-.06	-.01	.04	.01	-.00	.00
Satisfaction with	-.14*	-.09	-.04	-.15*	-.18**	-.03
Availability of	-.18**	-.18**	-.05	-.12*	-.19**	-.07
# of helpers	-.05	-.07	.04	-.01	-.01	.02

[a]Of the 132 correlations presented, 61 or 46% are significant at $p < .05$ or less.

[b]Types of social support come from ratings from the SPS. Frequency of social support comes from ratings from the ISSB. All other social support ratings are from the CSSM.

*$r > .11$ is significant at the .05 level.

**$r \geq .16$ is significant at the .01 level.

Table 36. Continued

Social support[b] (SS)	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 2						
Attachment	-.16*	-.13*	.06	-.25**	-.26**	.02
Social integration	-.21**	-.10	.04	-.27**	-.22**	.01
Reassurance/worth	-.30**	-.21**	-.09	-.36**	-.38**	-.19**
Reliable alliance	-.18**	-.17**	.03	-.26**	-.26**	-.06
Guidance	-.20**	-.12*	.07	-.20**	-.19**	.02
Opportunity/nurturance	-.11	-.03	.13*	-.07	-.05	.07
Frequency of SS	.02	.07	.18**	.08	.05	.26**
Amount of SS	.03	.02	.13*	.01	-.02	.12*
Satisfaction with	-.05	-.12*	.11	-.13*	-.18**	.09
Availability of	-.18**	-.20**	.01	-.21**	-.25**	-.04
# of helpers	.03	-.04	.01	.04	.05	.07

Table 37. Overall regression effects (R-squares)[a] for positive, negative, and total life stress (time 1), the various illness measures, and appropriate social support received[b]

Time 1 life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Positive	.01[c]	.03	(.05)	.02	.01	.02
Negative	(.21)	(.17)	(.16)	(.11)	(.11)	(.11)
Total	(.11)	(.06)	(.16)	(.08)	(.06)	(.10)

[a]Of the 18 R-square values presented, 13 or 72% are significant at $p < .05$ or less.

[b]Appropriate social support received was calculated by having subjects rate the appropriateness of the 40 ISSB items in dealing with the most stressful event they experienced over the last year. Subjects then rated how frequently they received the 40 ISSB items. "Appropriateness" minus "frequency of" ratings then became the measure of appropriate social support received (i.e., the sum of the absolute values of the difference scores became the moderator variable).

[c]All values which are significant at the .01 level are in parentheses.

Table 38. Life stress-illness correlations and their moderation by appropriate social support[a]

Types of life stress	Illness measure	Correlations for all levels of appropriate social support	Appropriate social support moderating variable	Correlations for contrasting levels of appropriate social support	
				High	Low
Negative (time 1)	LPIS (time 1)	.35**	Appropriate social support	.25**	.46**
Negative (time 1)	BDI (time 1)	.42**	Appropriate social support	.33**	.54**
Negative (time 1)	LPIS (time 2)	.31**	Appropriate social support	.33**	.28**
Total (time 1)	LPIS (time 1)	.19**	Appropriate social support	.09	.28**
Total (time 1)	BDI (time 1)	.30**	Appropriate social support	.20*	.39**

[a]Table includes only those appropriate social support variables which were found by regression analyses to have statistically significant effects.

*$\underline{r}$ > .11 is significant at the .01 level.
**$\underline{r}$ > .16 is significant at the .05 level. (For all levels of appropriate social support.)

*$\underline{r}$ > .17 is significant at the .05 level.
**$\underline{r}$ > .20 is significant at the .01 level. (For contrasting levels of appropriate social support.)

Table 39. Overall regression effects (R-squares)[a] for positive, negative, and total life stress, the various illness measures, attributional style, and frequency of social support

Attributional style, frequency of social support and life stress	Illness measures					
	Time 1			Time 2		
	BDI	LPIS	SIRS	BDI	LPIS	SIRS
Time 1						
Internality						
Positive	.04[b]	.03	(.10)	(.06)	(.05)	(.14)
Negative	(.22)	(.17)	(.18)	(.14)	(.12)	(.16)
Total	(.11)	(.06)	(.18)	(.09)	(.07)	(.14)
Stability						
Positive	.01	.02	(.10)	.02	.02	(.11)
Negative	(.27)	(.22)	(.20)	(.14)	(.14)	(.19)
Total	(.13)	(.10)	(.20)	(.09)	(.07)	(.15)
Globality						
Positive	.01	.04	(.08)	.02	.02	(.09)
Negative	(.24)	(.18)	(.22)	(.16)	(.13)	(.17)
Total	(.13)	(.11)	(.20)	(.09)	(.08)	(.14)
Controllability						
Positive	.03	.02	(.10)	(.06)	(.05)	(.13)
Negative	(.20)	(.16)	(.18)	(.13)	(.14)	(.17)
Total	(.13)	(.06)	(.19)	(.10)	(.08)	(.16)
Time 2						
Internality						
Positive	—	—	—	.03	.03	(.11)
Negative	—	—	—	(.32)	(.24)	(.22)
Total	—	—	—	(.19)	(.14)	(.18)
Stability						
Positive	—	—	—	(.06)	(.05)	(.14)
Negative	—	—	—	(.34)	(.26)	(.22)
Total	—	—	—	(.19)	(.15)	(.19)
Globality						
Positive	—	—	—	.02	.02	(.11)
Negative	—	—	—	(.32)	(.25)	(.23)
Total	—	—	—	(.17)	(.14)	(.19)
Controllability						
Positive	—	—	—	(.07)	(.05)	(.13)
Negative	—	—	—	(.32)	(.23)	(.20)
Total	—	—	—	(.18)	(.14)	(.19)

[a]Of the 108 R-square values presented, 92 or 85% are significant at $p < .05$ or less.

[b]All values which are significant at the .05 level or less are in parentheses. All values > .05 are also significant at the .01 level.

Table 40. Life stress-illness correlations and their moderation by frequency of social support and attributional variables[a]

Types of life stress	Illness measure	F values[c] for all levels of an attribution variable (moderation by social support)	Moderating attribution variable	F values[b] (of moderation by social support) for contrasting levels of an attribution variable		Correlations between life[d] stress and illness for contrasting levels of social support	
				High	Low	High SS	Low SS
Positive (time 1)	BDI (time 1)	.37	Internality	.57	5.18*	.15	-.06
Positive (time 1)	LPIS (time 2)	.51	Internality	1.12	7.03**	.21	.03
Positive (time 1)	BDI (time 2)	.21	Internality	2.84	9.57**	.19	-.01
Positive (time 1)	SIRS (time 2)	3.73	Internality	7.69**	.28	-.00	.18
Positive (time 1)	LPIS (time 2)	.51	Controllability	.45	5.70*	.14	.03
Positive (time 1)	BDI (time 2)	.21	Controllability	1.32	5.10*	.13	.07
Positive (time 1)	SIRS (time 2)	3.73	Controllability	11.24**	2.07	.00	.32**
Negative (time 1)	LPIS (time 1)	6.03*	Stability	.09	12.37**	.58**	.32**
Negative (time 1)	BDI (time 2)	6.15*	Globality	11.32**	.06	.41**	.04
Positive (time 2)	LPIS (time 2)	3.77	Stability	.11	6.82**	.21	-.09
Positive (time 2)	BDI (time 2)	2.14	Stability	.01	7.92**	.23*	-.02
Positive (time 2)	BDI (time 2)	2.14	Controllability	.46	5.35*	.26*	-.05
Negative (time 2)	SIRS (time 2)	8.07**	Internality	12.15**	.00	.53**	.21
Negative (time 2)	BDI (time 2)	14.59**	Stability	.73	12.28**	.61**	.57**
Negative (time 2)	SIRS (time 2)	8.07**	Globality	13.52**	.37*	.53**	.16

Total (time 2)	BDI (time 2)	5.87*	Internality	4.35*	1.08	.36**	.33**
Total (time 2)	SIRS (time 2)	7.71**	Globality	6.94**	.33	.43**	.09

[a]Table includes only those attribution variables which were found by regression analyses to have statistically significant effects.

[b]F values refer to the moderation effects of frequency of social support at high and low levels of the designated attribution variable.

F values $\geq$ 4.00 are significant at the .05 level.
F values $\geq$ 6.82 are significant at the .01 level.

[c]F values refer to the interaction terms of regression analyses of life stress-illness correlations being moderated by frequency of social support (i.e., a significant F value means that frequency of support moderated that life stress-illness relationship).

[d]Correlations are for contrasting levels of social support for only the level of the attributional variable that was most significant under the columns to the left (e.g., the first two correlations are for low levels of internality).

*$r \geq .23$ is significant at the .05 level.

**$r \geq .31$ is significant at the .01 level.

Table 41. Descriptive statistics for all variables[a]

	Time 1		Time 2	
	Mean	(s.d.)	Mean	(s.d.)
Life stress				
Positive	11.16	(8.24)	4.46	(4.14)
Negative	11.24	(10.19)	4.97	(5.17)
Total	22.34	(14.92)	9.40	(7.15)
Anticipated stress				
Positive	2.63	(2.59)	1.94	(2.10)
Negative	3.07	(2.71)	1.72	(2.07)
Total	5.71	(2.96)	3.67	(2.50)
Relative	4.61	(1.10)	4.43	(1.31)
Anticipation	4.57	(1.12)	—	—
# of events	3.22	(1.31)	2.05	(1.24)
Control of	4.48	(1.21)	4.35	(1.50)
Attributional style[b]				
Internality				
Positive	5.30	(.70)	5.22	(.72)
Negative	4.23	(.86)	4.14	(.87)
Total	4.76	(.57)	4.68	(.57)
Stability				
Positive	5.23	(.67)	5.08	(.67)
Negative	4.04	(.69)	4.00	(.71)
Total	4.63	(.48)	4.54	(.50)
Globality				
Positive	5.07	(.76)	4.94	(.81)
Negative	3.97	(.90)	3.86	(.90)
Total	4.52	(.65)	4.40	(.68)
Perceptions of control[c]				
Hypothetical				
Positive	5.29	(.76)	5.13	(.75)
Negative	4.10	(.90)	4.03	(.83)
Total	4.69	(.64)	4.58	(.62)
Experienced				
Positive	5.28	(1.51)	4.33	(2.40)
Negative	3.66	(1.39)	3.01	(1.99)
Total	4.61	(.99)	4.25	(1.63)

[a] $n = 305$.

[b] Attributional style ratings are on 7-point scales.

[c] Perception of control ratings are on 7-point scales.

Table 41. Continued

	Time 1		Time 2	
	Mean	(s.d.)	Mean	(s.d.)
Social support[d]				
Frequency	105.19	(22.72)	95.52	(24.22)
Amount of	3.96	(.53)	3.95	(.60)
Satisfaction of	3.84	(.56)	3.79	(.64)
Availability of	3.95	(.60)	3.87	(.64)
# of helpers	7.55	(3.44)	6.78	(3.20)
Types of social support[e]				
Attachment	13.56	(2.33)	13.41	(2.37)
Social integration	13.73	(1.91)	13.62	(2.02)
Reassurance/worth	12.64	(2.01)	12.52	(1.97)
Reliable alliance	14.35	(1.73)	14.21	(1.76)
Guidance	14.15	(2.07)	14.17	(1.95)
Opportunity/nurturance	12.10	(2.09)	11.97	(2.14)
Illness variables				
BDI	7.83	(6.52)	7.17	(6.64)
LPIS	4.24	(2.85)	3.78	(2.89)
SIRS	11.34	(5.12)	7.90	(4.25)
Age	19.61	(1.87)	—	—
Present stress level[f]	4.59	(1.28)	4.74	(1.55)

[d]Amount of, satisfaction with, and availability of social support are on 5-point scales.

[e]Types of social support are on 16-point scales.

[f]Present stress level is on a 7-point scale.

FIGURE

Time 1

Life Events (of the last year)

LES (Questions from the ISSB were used to study the social support subjects received for their most stressful event — i.e., appropriate social support)

Measure of anticipated stressful events

Attributional Style (hypothetical perception of control)

ASQ

Social Support

ISSB (frequency over the last year)

SPS (type now receiving)

CSSM (amount, satisfaction, availability — presently)

Social Desirability

MCSDS

Illness Measures

LPIS (psychophysiological)

BDI (depression)

SIRS (physical)

(Total of approximately 500 items)

Estimate of 1-1½ hours to complete

Time 2 (approximately 2 months later)

Life Events (of the last two months)

LES

Measure of the outcome of anticipated stressful events

Attributional Style (hypothetical perception of control)

ASQ

Social Support

ISSB (frequency over the last two months)

SPS (type now receiving)

CSSM (amount, availability, satisfaction — presently)

Illness Measures

LPIS

BDI

SIRS

(Total of approximately 350 items)

Estimate of 1 hour to complete

Figure 1. Sequence of assessments

APPENDIX A:

LIFE EXPERIENCES SURVEY

APPENDIX B:

ANTICIPATED LIFE STRESS

Anticipated Life Stress

People often anticipate that they will experience certain stressful events in the future. I would like you to answer some questions about some of the stressful events that you anticipate will happen to you during the next couple of months. Please identify any stressful life events that you anticipate you'll experience in the next couple of months in each of the following categories:

Category	Possible examples
Academics	(e.g., major tests, major projects, stressful presentations, academic probation, changing a major, failing a class, etc.)
Work	(e.g., change in work responsibilities, change in the number of hours you work, change in actual job, being fired, etc.)
Family/interpersonal relations	(e.g., marriage or divorce (your own or your parents), gaining a new family member (birth, adoption), more arguments/trouble with your spouse, friends, or other family members, death of loved one, break-up with boy/girlfriend, etc.)
Health	(e.g., illness worsening (your own or a friend's or family member's), sexual difficulties, events that put your health in danger, etc.)
Other	(e.g., any stressful events that don't fit into the above categories — for example, change of residence, borrowing a large sum of money, detention in jail, change in financial status, etc.)

Please complete each of the following sheets (next page) for events that you anticipate you'll experience in each of the above categories. If you do not anticipate the occurrence of any stressful events in a specific category over the next couple of months, then leave the sheet for that category blank. If you anticipate more than one stressful event in a certain category, ask the experimenter for more sheets for that category.

For example, if I anticipate giving an important presentation (that is very stressful for me) and failing a class in the next couple of months, then I would complete two separate sheets under the category of academics (i.e., one for each event). If I did not have a job or did not anticipate any stressful events associated with my job, then I would leave the work category sheet blank.

CATEGORY: ACADEMICS WORK FAMILY/INTERPERSONAL RELATIONS HEALTH OTHER

1. What is the event? _____
(write down the event)

2. To what extent do you think the event will have a positive or negative impact on your life at the time the event will occur? Circle the appropriate rating below:

Extremely negative	Moderately negative	Somewhat negative	No impact	Slightly positive	Moderately positive	Extremely positive
-3	-2	-1	0	+1	+2	+3

3. Relative to other stressors you've experienced, how stressful do you think this event will be for you? Circle the appropriate ratings.

1 (not stressful) 2 3 4 5 6 7 (very stressful)

4. Relative to other stressors in your life right now, how stressful is the anticipation of (thought about) this event for you? Circle the appropriate rating.

1 (not stressful) 2 3 4 5 6 7 (very stressful)

5. How much control do you believe you will have over the occurrence of the event? Circle the appropriate rating.

1 (no control) 2 3 4 5 6 7 (total control)

APPENDIX C:

ATTRIBUTIONAL STYLE QUESTIONNAIRE

APPENDIX D:

LANGNER'S PSYCHIATRIC IMPAIRMENT SCALE

APPENDIX E:

SERIOUSNESS OF ILLNESS RATING SCALE

Seriousness of Illness Rating Scale

Please blacken the first circles on the purple answer sheet that correspond to the number of any of the following illnesses or conditions you have experienced within the last six months. For example, if you have experienced hiccups in the last six months, then you would darken in the first circle of number five on the purple answer sheet. If you do not understand what a certain illness is or have not experienced it, leave that number blank.

1. Dandruff
2. Cold sore, canker sore
3. Corns
4. Warts
5. Hiccups
6. Bad breath
7. Sty
8. Common cold
9. Farsightedness
10. Nosebleed
11. Sore throat
12. Nearsightedness
13. Sunburn
14. Constipation
15. Astigmatism
16. Laryngitis
17. Ringworm
18. Headache
19. Scabies
20. Boils
21. Heartburn
22. Acne
23. Abscessed tooth
24. Colorblindness
25. Tonsillitis
26. Diarrhea
27. Carbuncle
28. Chicken pox
29. Mumps
30. Dizziness
31. Sinus infection
32. Bed sores
33. Increased menstrual flow
34. Fainting
35. Measles
36. Painful menstruation
37. Infection of the middle ear
38. Varicose veins
39. Psoriasis
40. No menstrual period
41. Hemorrhoids
42. Hay fever
43. Low blood pressure
44. Exzema
45. Drug allergy
46. Bronchitis
47. Hyperventilation
48. Shingles
49. Mononucleosis
50. Infected eye
51. Bursitis
52. Whooping cough
53. Lumbago
54. Fibroids of the uterus
55. Migraine
56. Hernia
57. Frostbite
58. Goiter
59. Abortion
60. Ovarian cyst
61. Heatstroke
62. Gonorrhea
63. Iregular heart beat
64. Overweight
65. Anemia
66. Gout
67. Snake bite
68. Appendicitis
69. Pneumonia
70. Frigidity
71. Burns
72. Kidney infection
73. Inability for sexual intercourse
74. Starvation
75. High blood pressure
76. Chest pain

Fill in any illnesses you've experienced in the last six months that are not on this inventory:

_____

APPENDIX F:

BECK DEPRESSION INVENTORY

APPENDIX G:

SOCIAL PROVISIONS SCALE

APPENDIX H:

INVENTORY OF SOCIALLY SUPPORTIVE BEHAVIORS

APPENDIX I:

COMPREHENSIVE SOCIAL SUPPORT MEASURE

Comprehensive Social Support Measure

Please write down the initials of individuals in your life that you can presently rely on for help or can trust and can talk to (e.g., give you support) under the Initials column. Next identify your relationship to each of these individuals (e.g., mother, counselor, friend, boss, wife, co-worker, professor, etc.) and put this under the Relationship column across from the appropriate initials. Finally, rate each of these individuals on the amount of social support they give you (1 = no support; 5 = a lot of support); how satisfied you are with this support (1 = not satisfied; 5 = very satisfied); and how easy it is to contact and interact with this person (1 = very hard; 5 = very easy — i.e., availability of this person). Place the ratings under the appropriate headings across from the appropriate initials. For example, if I had a friend, R.J. who provided a moderate amount of support (rating of 3), whose support I was fairly satisfied with (rating of 2), but who was very available and accessible (rating of 5), then I would mark this sheet in the following way:

Initials	Relationship	Rating of Amount of Support	Rating of Satisfaction	Rating of Availability
e.g., RJ	Friend	3	2	5

APPENDIX J:

MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE

APPENDIX K:

HUMAN SUBJECTS RESEARCH APPROVAL

INFORMATION ON THE USE OF HUMAN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY

(Please follow the accompanying instructions for completing this form.)

1. Title of project (please type): A Prospective and Retrospective Study of Attributional Style, Social Support, and the Life Events-Illness Relationship

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

Barbara J. Taverna	2/5/85	Barbara J. Taverna
Typed Named of Principal Investigator	Date	Signature of Principal Investigator

Psychology and Office of Student Life	294-1742 294-1020
Campus Address	Campus Telephone

29

3. Signatures of others (if any)

Signatures of others (if any)	Date	Relationship to Principal Investigator
Norman A. Scott	02/08/85	Major Professor
Psychology W259 Quad		

4. ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomforts to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

- ☐ Medical clearance necessary before subjects can participate
- ☐ Samples (blood, tissue, etc.) from subjects
- ☐ Administration of substances (foods, drugs, etc.) to subjects
- ☐ Physical exercise or conditioning for subjects
- ☐ Deception of subjects
- ☐ Subjects under 14 years of age and(or) ☐ Subjects 14-17 years of age
- ☐ Subjects in institutions
- ☐ Research must be approved by another institution or agency

RECEIVED FEB 11 '85 ISU GRADUATE COLLEGE

5. ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.

- ☒ Signed informed consent will be obtained.
- ☐ Modified informed consent will be obtained.

6. Anticipated date on which subjects will be first contacted: Month 2 Day 26 Year '85

Anticipated date for last contact with subjects: 4 25 '85

7. If Applicable: Anticipated date on which audio or visual tapes will be erased and(or) identifiers will be removed from completed survey instruments: 4 (Month) 25 (Day) '85 (Year)

8.

Signature of Head or Chairperson	Date	Department or Administrative Unit
William R. Lovaas	2/8/85	Psychology

9. Decision of the University Committee on the Use of Human Subjects in Research:

☒ Project Approved ☐ Project not approved ☐ No action required

George G. Karas	2/6/85	George G. Karas
Name of Committee Chairperson	Date	Signature of Committee Chairperson