

THE ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS,  
LIFE EVENT STRESS, SOCIAL SUPPORT AND PERSONALITY WITH  
DEPRESSION, PSYCHOSOMATIC DISORDERS AND ALCOHOL USE

by

BRENT A. VULCANO

A thesis  
presented to the University of Manitoba  
in partial fulfillment of the  
requirements for the degree of  
DOCTOR OF PHILOSOPHY  
in  
THE DEPARTMENT OF PSYCHOLOGY

Winnipeg, Manitoba

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This manuscript represents the culmination of an extended study period. Projects like this one usually warrant dwelling on the effort expended to reach the point of completion. The point of completion also represents a new start. I relish the prospects of this new beginning as I look ahead to the future. As I do so, the author would like to recognize the aid of numerous people. Special thanks are extended to Dr. Lawrence Breen for the effort he expended on my behalf throughout my term as his graduate student and in particular during this study. The author also wishes to thank Dr. Gordon Barnes who encouraged me to be a scholar and for his continuous support and guidance which was evidenced here as well. I would like to acknowledge the aid of Drs. R. Linden, F. Marcuse, of the University of Manitoba and Helen Annis of the Addiction Research Foundation in Toronto, for their suggestions, efforts and input to this project. I wish to express a very special thankyou to Sharon Greene for her participation and support throughout the completion of this project. The author would like to thank Dr. Skip Stambrook for his personal interest and his helpful suggestions extended to me over the past three years. Also, I would like to thank Lois Peters for her assistance and contributions to this project. I am indebted and grateful

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## ABSTRACT

The present study examined the relationship between life event stress, illness and alcohol use as a function of one's social support level and personality, while taking into account the "contamination" of past life event research and the potential differential response to life event stress (i.e., depression, psychosomatic disorders and alcohol use). Three hundred and three university undergraduate students voluntarily completed an extensive questionnaire. In addition to demographics and life event stress, predictor variables measured were: social support, including loneliness; anxiety, rationality, and self concept. Outcome measures included depression, psychosomatic disorders, and alcohol use. According to the study results, life event stress was observed to be associated with mental and physical illness but was found to be unrelated to alcohol use. The "contaminated" events seemed to account for the stress-illness relationship. Uncontaminated life stressors did not interact with social support or personality variables to predict any of the outcome measures. Further, according to canonical correlation analysis, the predictor canonical variables related similarly, not differentially, to the outcome canonical variables. Life event stress did not seem to predict different outcomes among different people. It was concluded

that little, if any, relationship exists between life stress and mental or physical illness, nor does this study provide support for a relationship between life event stress and alcohol use. These findings were suggested to be as a result of methodological problems. In the future, there is a need to reconceptualize stress and measure it differently, including utilizing longitudinal designs.

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Holmes & Rahe ( 1967 ) developed a scale which purportedly measures life event stress. Subsequently, much research has been conducted employing this scale in an attempt to link life event stress with illness, and as such this scale is widely acclaimed by academics, researchers and many others in the business world ( see Dohrenwend & Dohrenwend, 1974 ). Despite this the results of a recent study indicate that current measures of life event stress are inadequate ( Schroeder & Costa, 1984 ). The present study focuses on this finding.

This study examined the association of life event stress with depression, psychosomatic disorders and alcohol use as a function of one's social support level and personality. The notion that disease is related one's environment was suggested by Donnison ( 1938 ) and Halliday ( 1949 ). According to Donnison ( 1938 ), organic disease is related to an individual's reaction to stimuli induced by life in a civilized society. This notion was the forerunner of the

idea that biomedical effects result from one's environment ( Henry & Stephens, 1977 ). Similarly, Halliday ( 1949 ) noted that changes in the environment were related to an increase in the incidence of several diseases including high blood pressure, ulcers and coronary heart disease.

Does life stress predict physical and mental health problems? Research has shown that there exists a relationship between life event stress and both mental illness ( e.g., Brown & Harris, 1978 ) and physical illness ( e.g., Cobb & Rose, 1973 ). The exact nature of this relationship has yet to be determined as the link between life event stress and illness has been consistently observed to be a "weak" association at best. According to Schroeder & Costa ( 1984 ), studies that have related life event stress to illness by utilizing retrospective self-report designs have shown correlations on the order of .2-.3 in a wide array of populations experiencing a broad range of disorders ( cf. Dohrenwend & Dohrenwend, 1974 ). Further, a number of prospective designed studies have failed to replicate the findings from retrospective studies ( cf. Goldberg & Comstock, 1976; Theorell, Lind & Floderus, 1975 ). In short, the findings concerning the nature of the relationship between life event stress and illness are equivocal.

Consequently, Schroeder & Costa ( 1984 ) argue that memory, perception, as well as response tendencies, could be artifacts which account for the weak associations observed

between life event stress and illness. They claim that the self-report methodology often used to test the relationship between life event stress and illness, which has been appropriately criticized for methodological flaws ( cf. Rabkin & Struening, 1976 ), may explain the results that have been found in the past. Schroeder & Costa ( 1984 ) also argue that conventional life event measures contain "contaminated" items and consequently these may confound the relationship between life event stress and illness. They point out that conventional life event measures include: 1) items or events that relate to physical health and thus overlap with the criterion; 2) events that relate to neuroticism, which also influences the criterion; and 3) events that are subjective or vague and as a consequence could be affected by individual differences in psychological distress, response set and retrospective bias.

Schroeder & Costa ( 1984 ) examined whether substantive effects exist, or by contrast, whether methodological flaws could account for the observed correlations between life event stress and illness. That is, does "contamination" account for the effect. They observed that illness was significantly related to event subscales containing: 1) health related events, 2) neuroticism related events and 3) subjective events. They observed no relationship between "uncontaminated" events, or those thought to be representative of life event stress ( e.g., death of family member, quit a

job, new family member ), and illness. According to Schroeder & Costa ( 1984 ), "illness is essentially independent of the occurrence of life change per se".

If the uncontaminated events are defined as those which best represent "stress", then why are these events uncorrelated with illness measures? Two possible answers are plausible. Either no relationship exists, or an alternative explanation is that a third variable or variables may be responsible for the observed relationship between life event stress and illness ( Schroeder & Costa, 1984 ). Neuroticism is the variable thought to affect one's perception of life event stress and subsequent reporting of illness. Schroeder & Costa ( 1984 ) explain that items in life event scales may be measuring symptoms of psychopathology ( example items include; major change in eating habits, sexual difficulties ) or they may represent events that could be the result of neurotic traits, such as divorce, or being fired from a job. To illustrate this point they suggest that, "the occurrence of an event could reflect maladjustment by the person along with environmental changes... [and]...neurotic or distressed persons tend to endorse more symptoms and other health complaints" ( Schroeder & Costa, 1984; 854 ).

From these conclusions, it would seem to be important to recognize the confounding nature of "contaminated" items in life event measures. The first major objective of the present study was to examine the relationship between "contaminated" and "uncontaminated" life events and illness.

In addition to taking into account the findings of Schroeder & Costa ( 1984 ), the second major objective of the present study was to consider the potential role of social support and personality while examining the relationship between life event stress and illness. Social support has been suggested to act as a moderator of the potential effects of life event stress ( cf. Turner, Frankel & Levin, 1983 ). As such, the role of social support in its relationship with life event stress and illness needs to be considered here. As well, personality may play a role in the relationship between life event stress and illness ( cf. Eysenck, 1981 ). In the same way that a "neurotic" individual may differentially perceive his/her environment relative to someone who is not neurotic, an "anxious" or "irrational" person could also have an altered perception of his/her environment. Schroeder & Costa ( 1984 ) failed to measure social support or other personality variables besides neuroticism. By examining these dimensions and their possible interactions with stress events, the present study is an extension of their research design. In other words, do uncontaminated life events only affect those who are already vulnerable by reason of low social support or personality?

In addition to the aforementioned, it is of interest to inquire; does the life event stress effect exist but predict different outcomes in different people? A third major objective of this study was to acknowledge that individuals

may react differently to stress. It is suggested that stress may differentially impact on one's health and behavior. That is, life event stress may affect one person's physical health ( represented in this study by level of psychosomatic disorders ), while impacting upon another person's mental health ( represented in this case by a measure of depression ), and impact on still another person at a behavioral level ( represented here by an increase in alcohol use ). Life event stress has been shown to relate to both physical and mental illness ( cf. Jenkins, 1976; Caplan & Jones, 1975; Caplan, Cobb & French, 1975 ), however, past studies have failed to include multiple illness outcome measures. Again, this relationship may be a function of artifacts or methodological flaws, or due to an unmeasured personality variable such as neuroticism.

Besides affecting one's physical and mental health, stress may induce individual's to engage in compensating behaviors. The adverse effects of life event stress may contribute to the adoption of maladaptive behaviors in order to cope with these stressors. An individual may not be directly affected by the life event stress, but would engage in behavior that would possibly, in an indirect manner, affect one's health. For example, individual's may consume alcohol as a means of reducing the effects of stress. Recently, life event stress has been shown to be associated with alcohol use ( cf. Linsky, Straus & Colby, 1985 ). In short,

different people might respond to stress differently: some may choose alcohol; some might become depressed; others may develop psychosomatic disorders. This study attempts to identify which variables best predict the reactions of individuals under stress.

At this point it seems appropriate to offer a definition of "stress". Although stress is difficult to define, often because of its subjective nature ( Lazarus, 1966 ), the description offered by Gottesfeld ( 1979 ) seems to be suitable for present purposes. Stress is described as "any interference which disturbs the functioning of an organism at any level and produces a situation natural for the organism to avoid. Reactions to stress are typically manifested as disturbed psychologic and/or physiologic functioning..." (p.531). This disturbed functioning can include such phenomena as anxiety attacks, cardiovascular disorders, drug-related problems, gastrointestinal disorders, avoidance behavior, and depression.

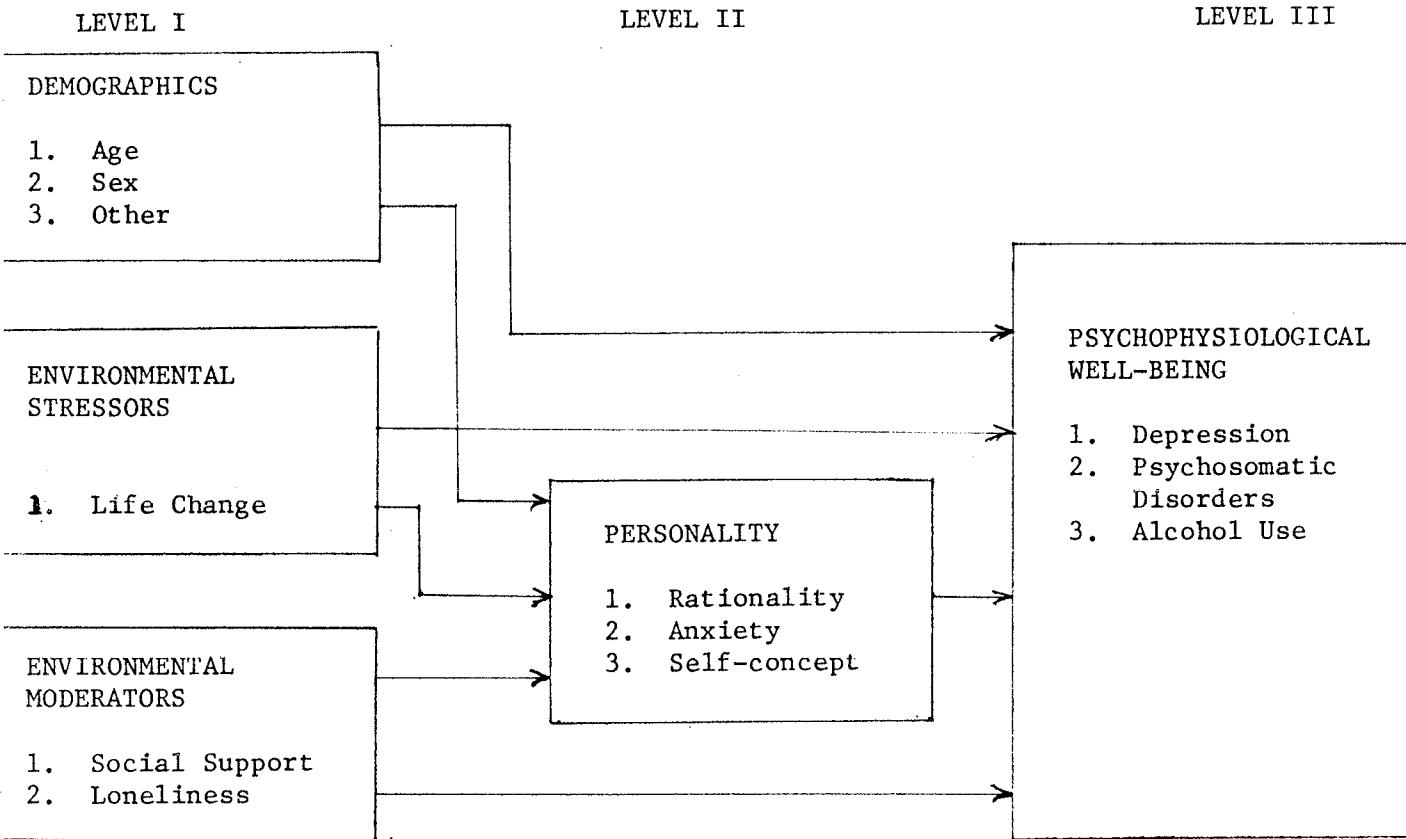
Noting that stress may impact on one's health, it may be worthwhile to explain how this might occur. There are two view points as to the link between psychological factors and disease. One is a focus on general susceptibility to illness ( cf. Kagan & Levi, 1974; Holmes & Rahe, 1967 ), the other viewpoint focuses on the development of specific illnesses ( cf. Weiner, 1977; Jenkins, 1971; 1976 ). The basic distinction between the generality versus the specificity

approach is whether generalized or specific somatic effects are predicted to result from the particular factors under study (Cohen, 1980). The generality theories postulate general biological mechanisms have negative effects on the system as a whole, or on vulnerable organ systems (e.g., vulnerable for reasons of inherited weaknesses). The specificity theories focus on particular biological mechanisms which are directly implicated, through their effects, in the development of a specific disease. One of the unique aspects of this study is that these two approaches were tested to see which is the more viable alternative. That is, an effort was made to determine whether the predictor variables exert a similar influence versus a different influence on the criterion variables. The intention was to examine whether demographic, environmental and personality factors act in a similar fashion or unique manner in predicting depression, psychosomatic disorders and alcohol use.

Figure 1 outlines the predictors and the three criterion variables. Essentially, lowered psychophysiological well-being was suggested to be due to a lack of social support, life event stress and an individual's personality.

In summary, the present study examined the relationship between life event stress and illness as a function of one's social support level and personality, while taking into account the "contamination" of past life event research and the potential differential response to life event stress (

Figure 1



Theoretical model indicating the relationship between the predictor variables and psychophysiological well-being. Each of the predictors are hypothesized to relate individually, and in combination with each other, to psychophysiological well-being.

i.e., depression, psychosomatic disorders and alcohol use ). In doing so, an attempt has been made to answer four central questions: 1) Does life event stress predict physical and mental illness? 2) If so, does "contamination account for the effect? 3) If "contamination" accounts for the effect, does there remain a possible role for "uncontaminated" life stressors in interaction effects with other variables ( e.g., social support and personality variables)? and 4) Does the life event stress effect still exist but predict different criterion or outcomes in different people?

At this time it would be useful to provide a brief explanation as to why the specific variables incorporated in this study are included vis a vis other variables. As far as the specific variables that are included in this study are concerned, many of these have been indicted as precursors of a variety of disorders, illnesses and diseases. For example, a high level of anxiety has been found to be a consistent psychosocial predictor of coronary heart disease, and has been indicted as a forerunner in the development of psychosomatic disorders ( Cohen, 1980 ). With this in mind, this variable may also relate to depression and alcohol use.

In addition, there has been a growing body of literature on the epidemiology of psychiatric disorders ( for reviews see Leighton, 1979; Weissman & Klerman, 1978 ) and the role of environmental influences such as life stress ( see

for instance, Dohrenwend & Dohrenwend, 1974 ) and social support ( e.g., Brown & Harris, 1978; Caplan, 1974 ) in predicting psychiatric disturbance. However, the role of personality factors in predicting psychiatric disturbance as measured in epidemiological surveys on mental health has been largely ignored ( Leighton, 1979 ). As Leighton aptly states: "...much more information is needed regarding personality assets and capacities as these relate to the origin, course and outcome of mental illnesses. It is desirable that epidemiology pertinent to these questions become more fully developed." (p.244) Personality variables have been related to psychiatric disturbances such as depression in clinical samples ( for a review see Chodoff, 1972 ), however, there are virtually no epidemiologic surveys on mental health that have included personality scales. The present study attempts to rectify this shortcoming. Thus, the variables that are outlined in Figure 1 were included in this study as these would seem to affect psychophysiological well-being.

### Criterion Variables

As far as the criterion variables to be utilized as measures of psychophysiological well-being; are concerned, depression, psychosomatic disorders and alcohol use have been identified as those which are most likely to manifest themselves as consequences related to the effects of life

event stress ( e.g., Sarason & Sarason, 1984 ). Briefly outlined is an examination of each of these criterion variables.

### Depression

There is an increasing concern about the etiology and treatment of depression. Depression is the most common psychiatric disorder ( Weissman & Myers, 1980 ) and the magnitude of untreated depression is high. Estimates of individuals not in treatment who suffer depression range from 66% to 80% ( i.e., only 20-35% of depressed people are receiving treatment ; Barrett, Hurst, DiScala & Rose, 1978 ). Point prevalence estimates of clinically significant depression are approximately 5%, with 10-20% of the population reporting significant depressive symptomatology ( Radloff, 1977; Weissman & Myers, 1978; Roberts & Vernon, 1982 ). Four recent studies used a self-report depression measure ( CES-D; Centre for Epidemiological Studies Depression Scale ) and employed general population samples ( Amenson & Lewinsohn, 1981; Comstock & Helsing, 1976; Craig & Van Natta, 1979; Frerichs, Aneshensel & Clark, 1981 ). The highest rates of depression were observed in the 18 to 24 age group. As well, estimates of the prevalence of depression among college students range from 15-20% ( Schuckit, 1982 ).

In addition to these concerns, depression has been concluded to be debilitating, where 50% of patients seen in general practice were unable to lead normal lives ( Johnson, 1973 ). Further, 30% admitted suicidal ideation. In short, depressive disorders can be a major health problem. As such there is a need to realize ways of detecting depression in the community for purposes of aiding those who are untreated.

Concerning the measurement of depression, the clinical criteria for the diagnosis of depression vary somewhat although most include symptoms such as negative mood, self depreciation, guilt, hopelessness, helplessness, social isolation, somatic complaints, and a reduced rate of behavior ( Brown & Harris, 1978 ). According to Comstock & Helsing ( 1976 ), it seems reasonable to infer that persons with clinical depression are concentrated among persons with high levels of related symptoms. Further, they suggest that the epidemiological pattern of clinical depression could be revealed in a broad form by the characteristics of persons with many or persistent symptoms of depression. Studies showing good concordance between high self-report scores and clinical impressions of depression ( e.g., Craig & Van Natta, 1973 ) support the idea that the frequencies of clinical depression and depressive symptoms will parallel each other in the population ( Comstock & Helsing, 1976 ). With the magnitude of undetected depression high, where depression is

often untreated, it has been conceded that self-report assessment of depressive symptoms is a useful method for gathering data on the prevalence of depression in the community.

### Psychosomatic Disorders

In considering the literature on the prevalence and incidence of psychosomatic disorders, the data indicate that the frequency of psychosomatic disorders is increasing in Western culture ( e.g., Canada Health Survey, 1981 ). In addition, these disorders are considered to be possible precursors of serious diseases ( e.g., coronary heart disease ). A psychosomatic disorder, as defined by Davison & Neale ( 1978 ), is a "disorder characterized by physical symptoms, which may involve actual tissue damage, usually in one organ system, produced in part by continued mobilization of the autonomic nervous system under stress" (p.598). Psychosomatic disorders for present purposes included the following symptoms and conditions: headaches, indigestion, constipation, nervous stomach, stomach aches, diarrhea, high blood pressure, asthma, ulcers, colitis, and problems in weight control. Previous research has indicated the aforementioned symptoms and conditions to be best thought of as "psychosomatic" because of the link between perceived stress in the environment and a personality overreactive to stress ( e.g., Cochrane, 1971; Weiner, 1977; Lipowski, 1968 ).

Past studies ( e.g., Pelletier, 1977 ) have shown that a significant percentage of people in the general population suffer from psychosomatic symptoms and conditions. For example, Schwab & Traven ( 1979 ) estimate that the total rate of psychosomatic conditions in adult patient populations range anywhere from 15% to 50%. In addition, they estimate rates were as high as 60% in the general population.

#### Prevalence of Alcohol Use

Stress may not directly impact on one's health where an individual may manage stress by engaging in potentially harmful compensating behaviors. Alcohol and tobacco use are two such behaviors. That is, people do drink and smoke for reasons other than as a reaction to stress, but the potential impact on their health would be equivocal. The perspective employed in this study is that stress experienced by an individual may lead that person to engage in behaviors he/she believes helpful for dealing with the stress. The indirect effects of the compensatory behaviors (drinking and tobacco use ) may have a negative impact on one's health.

By way of illustration, excessive alcohol use has been linked to mortality ( e.g., Dyer, Stamler, Paul, Lepper, Shekelle, McKean & Garside, 1980 ). The potential problems associated with excessive alcohol use have been outlined ( cf. Kissin & Begleiter, 1983 ). These include problems associated with one's liver, pancreas, brain, gastrointestinal tract and cardiovascular system.

Another reason for measuring alcohol consumption is that depressive symptomatology can be confounded with excessive drinking ( Schuckit, 1982 ), although Neff & Husaini ( 1982 ) noted there was not any higher level of depression among drinkers. If this is the case, abstinence usually results in the depressive symptoms disappearing. Consequently, it is important to be able to take into account the potential confounding effects of alcohol consumption.

Concerning the gathering of information on drinking practices, period prevalence measures involving the past week or month are suggested to give the most relevant data with the least distortion ( Blane & Hewitt, 1977 ). This consideration was adopted for purposes of the present study.

### Predictor Variables

Outlined in the following sections are possible predictors of illness. The associations between demographic characteristics, life event stress, social support, personality and illness will be reviewed.

### Demographic and Background Characteristics

Demographic and background characteristics may contribute to the prediction of depression, psychosomatic disorders and alcohol use. Also, it is necessary to measure these

variables as they may confound the relationships to be studied.

### Demographic Characteristics and Depression

The findings from studies that have examined the relationship between demographic characteristics and depression have been inconsistent. By way of an illustration, findings relating depression to age have indicated higher depression rates among the elderly ( e.g., Gurin, Veroff & Feld, 1960 ) and other studies have shown higher depression rates among youthful samples ( e.g., Comstock & Helsing, 1976 ). Adjusting for income level, younger people, i.e., the 18-25 year old group, demonstrate the highest depression scores ( cf. Comstock & Helsing, 1976 ). Upon examining the simultaneous influence of commonly studied demographic characteristics, including gender, age, marital status, education level, socioeconomic status and race, the following relationships are apparent.

Evidence from past research indicates that women, in comparison to men, preponderate in rates of depression ( e.g., Comstock & Helsing, 1976; Radloff, 1977; Amenson & Lewinsohn, 1981; Frerichs, Aneshensel & Clark, 1981 ). The depression prevalence rates among women can be 1.6 to 4 times as high as the rates for men ( cf. Weissman & Klerman, 1977 ), although Husaini, Neff & Stone ( 1980 ) failed to find a significant sex difference. Controlling for the po-

tential effects of other factors, gender differences emerge only in white samples ( Comstock & Helsing, 1976 ).

High rates of depression have been evidenced among adolescents and young adults ( ages 14-24 ). For example, in a recent epidemiological survey almost 47% of the adolescents surveyed, or one teenager in two, reported being depressed ( Barnes & Vulcano, 1984 ). Findings of other studies indicate a consistent negative relationship between age and depression ( e.g., Comstock & Helsing, 1976; Frerichs, et al., 1981; Craig & Van Natta, 1978; Husaini, et al., 1980 ). Another consistent finding is that in every age group, rates of depression are highest among women ( Weissman & Klerman, 1977 ).

It is usually the case that single persons, including those who are divorced and separated, are more likely to be depressed in comparison to those who are married ( cf. Canada Health Survey, 1981; Craig & Van Natta, 1978; Husaini, et al., 1980 ). However, evidence exists to indicate that being married serves a protective function for males but may have a detrimental effect for females ( cf. Weissman & Klerman, 1977 ).

Utilizing various socioeconomic status indicators, high depression levels have been associated with low socioeconomic status. For example, high depression levels are consistently observed among those with a low income ( e.g.,

Frerichs, et al., 1981; Amenson & Lewinsohn, 1981 ). High depression rates are usually reported by individuals possessing less education ( e.g., Frerichs, et al., 1981; Comstock & Helsing, 1976; Husaini, et al., 1980; Amenson & Lewinsohn, 1981 ).

Differences in reported depression rates seem to diminish and become nonsignificant upon controlling for the effects of other factors. For example, upon controlling for socioeconomic status, blacks are not observed to report the highest rates of depression ( e.g., Frerichs, et al., 1981 ).

#### Demographic Characteristics and Psychosomatic Disorders

There would seem to be few available studies that have examined the relationship between demographic characteristics and psychosomatic disorders. According to available studies, women report more psychosomatic illnesses than do men ( e.g., Sheldrake, 1977 ). In this study, psychosomatic illnesses included asthma, headaches, ulcers, and high blood pressure. Elsewhere, Selzer, Paluszny & Carroll ( 1978 ) indicate that females complain more of "headaches", "feeling tired" and other illnesses generally thought of as being "psychosomatic". Lastly, in a large epidemiological study, Schwab & Traven ( 1979 ) reported that females were more likely to develop psychosomatic disorders.

Schwab & Traven ( 1979 ) reported that, among an American general population sample, those over age 45, in comparison to younger respondents, were at higher risk for developing psychosomatic disorders. In a fairly recent study, Vulcano, Barnes & Breen ( 1984 ) found that a population of young police officers reported a significantly higher prevalence of psychosomatic disorders than did the above mentioned general population sample. The different prevalence rates reported by each was suggested to be due to the stress associated with the officer's occupation. Generally, psychosomatic disorders tend to be more evident among older age groups in comparison to younger age groups ( cf. Canada Health Survey, 1981 ).

Persons who were previously married ( i.e., separated or divorced ) tend to report higher rates of psychosomatic disorders in comparison to respondents who are married or single ( Schwab & Traven, 1979 ). In general, married respondents seem to report fewer psychosomatic disorders than single respondents, including separated and divorced persons.

Those of lower socioeconomic status have a greater number of psychosomatic disorders ( Schwab & Traven, 1979 ). Controlling for the effects of socioeconomic status, there would seem to be no significant difference between whites and blacks ( Schwab & Traven, 1979 ).

## Demographic Characteristics and Drinking Level

While the results of large scale studies are consistent regarding the relationship between gender, age and drinking level, the findings relating drinking level with other demographic characteristics are equivocal.

From the Canada Health Survey ( 1981 ), a study conducted utilizing a Canadian general population sample, it is possible to conclude that drinking prevalence is much higher among men than it is for women. Specifically, in the 20-24 year old age group, 31% of men and 8% of women have 14 or more drinks per week, or are defined as "heavy drinkers" according to the Canada Health Survey ( 1981 ), while 10% of men and 2% of women age 65 and over consume 14 or more drinks per week.

According to the findings of the Canada Health Survey ( 1981 ), high prevalence of regular alcohol consumption is not statistically associated with higher, rather than lower, education levels. Prevalence of alcohol consumption is statistically associated with higher income earners ( Canada Health Survey, 1981 ). This finding was also evidenced in a previous Canadian national survey ( McGregor, 1978 ).

Prevalence of regular alcohol consumption increases with occupational status. That is, in comparison to blue or white collar occupations, those in managerial and profes-

sional occupations are significantly more likely to be current drinkers ( cf. Canada Health Survey, 1981 ).

In summary, individuals reporting significant levels of depressive symptoms tend to be younger, female, less educated, have a low income and be single, including divorced and separated persons. Generally, psychosomatic disorders tend to be more evident among older age groups in comparison to younger age groups, and females rather than males, report higher levels of these. Men tend to drink more than women, and this is reported in all age categories. High income earners tend to drink more and alcohol consumption increases with occupational status.

### Stress

What is the nature of the relationship between stress and health? According to past findings, stress will negatively impact on one's health. The potential effect of stress is noted to possibly vary as a function of one's social support level and one's personality.

There is very little consensus as to what constitutes a stressor as different events have different meanings to different people. The only agreement among researchers, is that, a person's perception of an event, whether it is seen as stressful or otherwise, is what is important. One person's stress can be of no consequence to another, or may in

fact become a relished challenge to another ( Finestone, 1978; List, 1967 ).

Among the first to establish a link between psychosocial stressors and health were Hinkle & Wolff ( 1957 ). Since that time there has been an expansive growth of literature in this area ( cf. Kagan & Levi, 1974; Jenkins, 1976; Caplan, Cobb & French, 1975 ). For example, the role of stress in psychosomatic diseases has long been accepted ( e.g., Selye, 1956 ) and, the notion of stress as a precipitating factor in chronic diseases is gaining widespread acceptance.

Stress is suspected to be linked with health via physiological mechanisms which produce biochemical changes in the body ( cf. Pardine & Napoli, 1983 ). These changes are believed to produce a vulnerability or susceptibility to disease. By way of illustration, a high stress group, as defined by a cut-off score of 26 or above on the Life Experiences Survey ( Sarason, Johnson & Siegel, 1978 ), maintained an elevated stressor level throughout the recovery phase of an experimental manipulation. This was not the case for the low stress group. Their stressor level returned to normal. Stressor level was measured by blood pressure and heart rate. Thus, the authors ( Pardine & Napoli, 1983 ) concluded that stress does create "wear and tear" on an organism. Stress is suspected to create a weakness in the bodily systems in a general manner, but these

weaknesses are also noted to take specific paths as well as non-specific routes ( Mikhail, 1981 ).

### Life Event Stress

The role of stressful life events in the etiology of various diseases has been well documented over the last 30 years (see Rabkin & Struening, 1976). The general framework outlined was that the onset of illness was associated with a recent increase in the number of events that required socially adaptive responses on the part of the individual. The impact of events was presumed to be additive and the more events that occurred, the greater the impact.

Meyer (1951) attempted to systematize the relationship between stressful experiences and the development of somatic disorders. Numerous other studies (e.g., Dohrenwend & Dohrenwend, 1974) have investigated the relationship between life stress and susceptibility to physical and psychological problems. Accordingly, the bases for this research has been that life changes are stressful and require adaptation, while "marked degrees" of life change in the recent past tend to produce illness susceptibility. There is an abundance of evidence to indicate that a relationship exists between life stress, as measured by a self report index, and physical illness (e.g. Dohrenwend & Dohrenwend, 1974).

Holmes & Rahe (1967) attempted to quantify the extent of readjustment required by selected events which marked an advancement in specifying the qualities of stressors that are usually related to later illness. In order to do this, Holmes & Rahe (1967) developed the Social Readjustment Rating Scale (SRRS) based on a large sample's magnitude estimations of the amount of social readjustment an average person would experience when an event occurs. Social readjustment refers to the degree and duration of a person's accommodation to a life event, regardless of the event's desirability. There have been numerous findings of an association between high readjustment scores and illness onset (Dohrenwend & Dohrenwend, 1974; Rabkin & Struening, 1976).

According to Rahe (1974), life events is one measure of psychological stress where the more serious the life stress the higher the likelihood of disease sequelae. These findings have been interpreted as confirmation of the etiological significance of life stress. The idea that change is a central component of stressful experiences is common to many theoretical conceptions of stress (Selye, 1956).

Investigators have found modestly statistically significant relationships between life change and the onset of a host of illnesses (e.g., Prince & Miranda, 1977). Recent studies have focused on the effects of negative life events (e.g., Vinokur & Selzer, 1975). Vinokur & Selzer (1975) were one of several investigators who argued undesirable

events may have a different impact on individuals than would positive events i.e. certain negative events may have a more detrimental effect than change per se. According to Vinokur & Selzer (1975), undesirable events were found to be related to self ratings of depression, anxiety and tension as well as several other personality measures.

Holmes & Masuda (1974) feel the important thing about stressors is the adaptive demand made on the individual, irrespective of whether the life event is happy or sad. They disregard affect and are concerned solely with negative consequences.

Hinkle (1974) emphasized the role of negative life experiences while investigating differences in illness frequency. Illness was not randomly distributed throughout the sample. They found clusters of illnesses often appeared in a person having trouble adapting to his environment as perceived by the person. Those with the highest susceptibility to illness were those who failed to adapt successfully to negative life situations. Aakster (1974) holds a similar view where the failure to adapt to negative consequences is highlighted as the major concern with life events.

Johnson & Sarason (1978) provide support for conceptualizing life stress in terms of negative life change rather than in terms of change per se. This again, is consistent with others (Sarason, Johnson & Siegel, 1978; Mechanic,

1975; Vinokur & Selzer, 1975). Life events research ( e.g., Brown & Harris, 1978; Grant, Sweetwood, Yager & Gerst, 1981; Mueller, Edwards & Yarvis, 1977; ) indicates that a person's perception of the nature of change determines the impact on health. According to Sharit & Salvendy ( 1982 ), stressfulness of an event is related to a complex interaction of; 1) genetic predisposition, 2) early social experience, 3) cultural factors, and 4) a life long conditioning process. Self-report of life-events has been associated with depression and general psychiatric symptoms ( Paykel, Myers, Diener, Klerman, Lindenthal & Pepper, 1969; Myers, Lindenthal, Pepper & Ostrander, 1972; Dohrenwend, 1973; Dohrenwend & Dohrenwend, 1974 ).

### Depression

The association between stressful life events and various forms of psychological and physical disorders has been repeatedly documented. For example, Billings & Moos ( 1982c ) noted that much of the research examining stress and its relation to depression has been concerned with the effects of major life events. Environmental stressors have been implicated in the development and maintenance of depression ( cf. Paykel, 1979 ). Negative life changes in the areas of health, finances and interpersonal relationships ( deaths and separations ) have been tested for their depressogenic effects. These negative effects have been found to be 3-6 times more common among depressed individuals as compared to

general population controls ( Brown & Harris, 1978; Costello, 1982 ).

Lloyd ( 1980 ) indicated that, for six months following an event, depressive risk increases by a factor of five or six. Certain events, such as undesirable, loss, or severely threatening events, are particularly likely to precede a depression. Barnes & Prosen ( 1985 ) showed a significant relationship exists between father loss ( especially for the ages, 0-6 and 10-15 ) and depression in a large sample ( N=1250 ) of general practitioner's patients. The relationship held even when possible confounding factors were controlled. Also, Pearlin & Schooler ( 1978 ) found home life stressors relate to depression. These results suggest that stressful events can bring about depressive episodes.

Despite the claims made from the findings of the various studies, no study of psychiatric illness has explained more than 10% of the variance of the dependent variable, and as such, "research is unlikely to have clinical or preventive importance" ( Andrews & Tennant, 1978 ). Brown ( 1981 ) feels that this is a pessimistic view and one which is unwarranted. He explains that a reason for the weak relationships observed are that the measures utilized have been inadequate. Brown ( 1981 ) claims that the additive effect of scales is not necessary to precipitate depression. In a prospective study ( Brown & Harris, 1978 ), the occurrence of at least one severe event or major difficulty had causal significance for 49% of those who developed depression.

Billings & Moos ( 1982c ) point out that stressful life circumstances provide a partial explanation for the development of serious depression or the prevalence of depressed mood among normals. While up to 75% of depressed patients may have experienced a provoking event, one person in five in a nonpatient population will become clinically depressed after facing a severe stressor ( e.g., death of one's mother; Brown & Harris, 1978 ). Among general population samples, less than 10% of the variance of depressive symptomatology can be accounted for by life stressors ( Billings & Moos, 1981; Warheit, 1979 ). Stressors may act directly on depression or they may have indirect effects by reducing social resources and lead to maladaptive appraisals and ineffective coping responses ( Billings & Moos, 1981 ). In addition, depressives may describe themselves negatively as a function of stressful events.

#### Physical Health

Stressful life events may precipitate other forms of ill health. Several studies have reported a relationship between life events and physical symptoms.

In addition to examining depression, Billings & Moos ( 1982a ) looked at physical symptoms including headaches, stomach aches and indigestion occurring as a function of experiencing negative events. A significant degree of consistency was observed for the association between negative

events and symptom level. The relationship held even when statistical controls were applied for one's social background and initial symptom level. Those with higher social standing experienced fewer negative events and more positive events, and those with high levels of symptoms experienced more negative life events. They concluded that the association between events and symptoms may be due to sociodemographic factors. Negative events may be related to age, education, ethnicity and social class ( Kessler, 1979; Liem & Liem, 1978; Myers, Lindenthal & Pepper, 1974 ). Those of lower socioeconomic status may be more exposed to unemployment and poor health and thus experience a high number of negative life events. Persons of lower social status may report higher symptom levels leading to spurious events-symptoms relationships ( Billings & Moos, 1982a ).

Vulcano ( 1982 ) observed in a study of police officers that officers who reported suffering a high number of negative life events also reported a high level of psychosomatic disorders. These findings could possibly indicate that a relationship exists between life events and psychosomatic disorders.

#### Alcohol Use

Generally, stress tends to be accompanied by more problem-prone patterns of alcohol and drug use. Drinking and drug problems have been related to stressful life events (

e.g., Hoffman & Noem, 1975; Blum & Levine, 1975 ) and to job related stress ( e.g., Trice & Roman, 1973; Margolis, Kroes & Quinn, 1974; Mangione & Quinn, 1975 ). Also, it has been noted that the misuse of alcohol or drugs was related to higher stress as shown by a self report measure ( Sadava, Thistle & Forsyth, 1978 ).

Despite this pattern of findings, there is no evidence that stress related drinking or drug use is accompanied by a specific increase in the coping function of alcohol or drugs. That is, there is no evidence to indicate that either alcohol or drug use aids in allowing one to somehow cope effectively with stress. There is some support for the notion that people may not drink to escape, as drinking increases, the person may find more reasons to continue and fewer to justify abstinence. Thus, one may drink on impulse and adopt an "I don't care" attitude. So they feel there is no reason to discontinue, where drinking may represent a loss of purpose ( Sadava, et al., 1978 ).

Neff & Husaini ( 1982 ) noted that the relationship between life events and depression may vary according to alcohol consumption. Specifically, among abstainers and heavy drinkers, as opposed to moderate drinkers, life events are strongly related to depressive symptomatology.

The observed relationship between life events and health has been weak in past research ( cf. deFaire & Theorell, 1977; Hinkle, 1974; Rabkin & Struening, 1976; Wershaw & Reinhart, 1974; Vulcano, 1982 ). There may be a confounding between stress and illness as the scales which measure these dimensions tend to be highly correlated. This is suggested to be due to an overlap in just what the scale items are measuring. For example, research utilizing measurement of "daily hassles" has been suggested to improve the evidence for a relationship between life event stress and illness, however, Dohrenwend, Dohrenwend, Dodson & Shrout ( 1984 ) noted that the hassles scales items may overlap with health items. ( Daily hassles are events that occur on a daily basis and which are viewed as stressful; e.g., being stuck in rush hour traffic ). Schroeder & Costa ( 1984 ) also provide evidence for the confounding nature of the relationship between life event stress and illness as measured by current scales. In addition, the relationship between life event stress and illness may be moderated by several variables including social support and personality. The following section deals with these possibilities.

## Moderators

### Social Support

The link between a variety of psychosocial stressors and periods of illness have been amply documented (e.g., Henry & Stephens, 1977), as well, evidence has been presented which links stressful life events to a wide range of diseases and acute conditions (e.g., Prince & Miranda, 1977). In all of these studies, the stressor is conceptualized as an event or task which places an adaptive demand on the individual. It is inferred that these stressors create changes in life patterns which increase stress on the body and lead to a weakened state and vulnerability to illness (e.g., Antonovsky, 1979).

Recently, several models have been proposed which offer factors that mediate this relationship between stressful life events and adverse health consequences (see Cobb, 1974; Holmes & Masuda, 1974). According to the models, situational moderators, such as social support and social assets, are related to the lack of incidence of illness (see Kagan & Levi, 1974). Studies consistently indicate that social support plays a significant role in maintaining and promoting both psychological and physical health. Empirical evidence from several sources has indicated an inverse relationship between social support and physical and mental illness (cf. Gore, 1978; Berkman & Syme, 1979).

In past research, social support has been differentially defined. Cobb (1976) defines social support as " information which prompts the individual... to believe he is cared for and loved... esteemed and valued...and that he belongs to a network of communication and mutual obligation" (p.300). Cassel (1974) defines " support as the simple presence of others, and support as the feedback persons receive from significant others about the relationship between their behaviour and its consequences" ( Carveth & Gottlieb, 1979; p. 180 ). Other definitions include "psychosocial assets" (Nuckolls, Cassel & Caplan, 1972), " linkages with valued groups" (Coehlo, Hamburg & Adams, 1974 and " the psychological sense of community" (Sarason, 1974). House ( 1981 ) offers 4 types of support behaviors: 1) emotional support which involves caring, trust & empathy, 2) instrumental support which includes helping others do their work, loaning money, and aiding others with difficult tasks, 3) informational support which means giving information or teaching a skill which can provide a solution to a problem, 4) appraisal support which involves information that helps in evaluating personal performance, as when a work supervisor tells an underling that a job was well done. Importantly, these categories are not independent but do overlap as components of social support ( House, 1981 ). In short, there is little agreement on the exact definition of social support ( Carveth & Gottlieb, 1979; p. 181). In an attempt to tap into an individual's social support system, the

present study measured loneliness, one's personal support network and their satisfaction with available social support.

As stress may be differentially defined, social support too seems to mean different things to different people. One aspect that these definitions share is "a focus upon the significance of human relationships" ( Turner, Frankel & Levin, 1983 ). Social support is not just the resources available but involves the individual's experience of feeling supported. The important aspect would seem to be the perception of being supported ( cf. Turner, et al., 1983 ). "Social support thus refers to the clarity or certainty with which the individual experiences being loved, valued and able to count on others should the need arise" ( Turner, et al., 1983 ).

The inconsistent defining of social support has resulted in several criticisms of the research to date, primarily to do with the vagueness of the definitions and poor conceptualizations ( cf. Kaplan, Cassel & Gore, 1977 ). This criticism has led Turner ( 1983 ) to suggest that there are three categories of social support: 1) social integration, where one assesses support in terms of individual connections with other, including primary and secondary relationships, and informal as well as formal group associations, 2) social network analysis, involving a set of personal contacts including family, neighbors, work, church, etc., and

3) social psychological or perceptual approach, the experience of being supported. The third category is a popular conceptualization where Henderson ( 1981 ), in a prospective study, notes that a person's dissatisfaction with support he is receiving, relates to an increased risk of psychiatric disorder in the presence of "provoking agents". If social support is conceptualized as the latter, then the confounding with life events cannot occur, however, there may then be a confounding with measures of depression as the absence of perceived support may be an expression of depressive affect ( Turner, 1981; Turner, 1983 ).

Social support is believed to have three possible effects (Burke & Weir, 1980): 1) directly on the source of stress (prevention), 2) directly on measures of strain or well being (therapeutic) and 3) a moderating effect on the stress - strain relationship (buffering). Generally, it has been found that individuals who have a high level of social support are less likely to have stressful transactions with the environment resulting in the experience of strain and ill health ( e.g., Burke & Weir, 1980 ).

Thoits ( 1982 ) argues that social support has a direct relationship with psychological health ( i.e., main effect ). Cobb ( 1976 ) suggested that social support buffers the relationship between life stressors and mental health. Here, social support is hypothesized to affect mental health only when stressful life events are in evidence and only in

an indirect or buffering capacity. As social support is conceptualized by Cobb ( 1976 ), it does not promote mental health.

Evidence for a buffering role versus main effects is available from numerous sources ( cf. Cobb, 1976; Brown, et al., 1975; Dean & Lin, 1977; Nuckolls, et al., 1972 ). Evidence for main effects is also abundant ( cf. Andrews, et al., 1978; Aneshensel & Frerichs, 1982; Bell, Leroy & Stephenson, 1982; Dean & Ensel, 1982; Husaini, Neff, Newbrough & Moore, 1982 ). There are no conclusive results to argue whether social support buffers or acts as a main effect. House ( 1981 ) suggests that research test both formulations. This "inclusive" conceptualization was the one employed in the present study.

#### Life Stress, Social Support and Illness

Research has indicated the existance of a relationship between life stress events, social support and various forms of physical and psychological illness ( e.g., Andrews, Tenant, Hewson & Vaillant, 1978 ) including mental health ( Lin, Simeone, Ensel & Kuo, 1979 ), and depression ( Lin, Dean & Ensel, 1981 ). By way of illustration, Cobb & Kasl ( 1977 ) demonstrated the stress moderating effects of support among a sample of men who had lost their jobs. Also, social support may buffer effects of life stress and may be particularly relevant for depression ( cf. Brown, Bhrolchain &

Harris, 1975; Dean, Ensel & Lin, 1981 ). Here, a close confiding relationship seems to reduce the risk of developing depression following a life stress incident or the occurrence of a major difficulty. Results from several studies (e.g., Kaplan, Cassel & Gore, 1977) suggest that the joint effects of social support and stressor factors determine to an extent, the susceptibility or vulnerability of the individual to disease. The psychosocial factors are not deemed as being pathogenic, but conditioning variables determining the vulnerability to a wide array of disease outcome, such as psychosomatic disorders.

Lazarus (1966) also pointed out the role of social support in combatting life change. Reactions or demands of life changes depend on the capacity of the persons to deal with the life changes and on the nature of the surrounding environment, including the amount of social support available (Kaplan, Cassel & Gore, 1977; Mechanic, 1974; Nuckolls, Cassel & Kaplan, 1972). Other studies have advanced the proposition that primary group support has health protective effects (see Cassel, 1974; Cobb, 1976).

Berkman ( 1979 ) analyzed the relationship between social support and health according to the 1965 data collected on a random basis from adults in Alameda County, California. There were 9,000 persons, aged 30 to 69 in the sample. The results showed that people with many social contacts had the lowest mortality rates. Berkman ( 1979 ) concluded this as-

sociation was independent of a variety of sociodemographic and risk factor measures ( e.g., health status at the time of the survey, socioeconomic status, health practices such as smoking and alcohol consumption ).

In addition, isolation, lack of social and community ties may influence resistance and increase vulnerability to disease in general. Support for the hypothesis that social and community ties may be protective against a wide variety of disease outcomes was offered when four sources of social relationships were examined (Berkman & Syme, 1979). The four relationships were 1) marriage, 2) contacts with close friends and relatives, 3) church membership, and 4) informal and formal group associations. People with social ties and relationships had lower mortality rates than people without such ties. In addition, each of the four sources was shown to predict mortality independent of the other three. The strongest predictors were marriage and contact with friends and relatives. Also, for every age group examined, and for both males and females, those with many contacts had the lowest mortality rates in comparison to people with few contacts who had the highest mortality rates. The association between social relations and mortality was also shown to be independent of physical health at the time of the survey, year of death, socioeconomic status, smoking, alcohol use, physical inactivity, obesity, and low utilization of preventive health services.

Vulcano, Barnes & Breen ( 1983 ) noted that police officers who had more social relationships ( a social network conceptualization of social support ) were less lonely, more rational, less anxious, more satisfied with their job, rated their job as less stressful, were experiencing less negative life change, had more social assets and reported a lower level of psychosomatic disorders than those with fewer social relationships. This pattern of results is consistent with past findings and all of the relationships were in the expected direction.

Antonovsky ( 1979 ) suggests that persons undergoing stressful life events are cushioned from harmful physiological or psychological consequences when such events are experienced in the presence of social support. Turner ( 1983 ) suggests that social factors, when functioning positively, serve to lower susceptibility to all disease and disorder generally.

According to Billings & Moos ( 1982b ) those who experienced a high level of negative events reported less support from work and family relationships than those that consistently experienced no negative events. These differences remained after controlling for social background and symptom levels. Holahan & Moos ( 1981 ) measured initial levels of support, life change and psychological maladjustment and noted a decrease in work and family support were significantly related to an increase in symptomatology.

The role of social support in mediating life stress effects are provided by Brown & Harris ( 1978 ), Myers, et al. ( 1975 ) and Turner ( 1981 ). In depression research, the lack of a confiding relationship is associated with symptoms. Turner ( 1983 ) noted that Dean, Lin, Tausig & Ensel ( 1980 ) found that a lack of companionship support showed the strongest association with depression for all age groups.

In addition, the effect of social support has been noted to vary as a function of demographic characteristics. Billings & Moos ( 1982a ) noted those of lower socioeconomic status may be exposed to more stress which results in reduced support and impaired functioning. Other studies have shown that poor physical and mental health are more prevalent among the socioeconomically deprived ( e.g., Canada Health Survey, 1981; Schwab, et al., 1979 ). The effects of support were especially salient for those under high stress, including those experiencing negative life events and patients recovering from alcoholism ( Billings & Moos, 1982b ).

Despite all the evidence in favor of the relationship between social support and illness, Wallston, DeVillis & DeVillis ( 1983 ) claim the research base is "weak". They claim that the measurements of life events are susceptible to confounding with social support because the occurrence of one event may attenuate the source of social support. Death

of a partner obviously eliminates a source of social support ( Thoits, 1982 ). Further, they claim that viewing low support as leading directly to illness is an oversimplification, whereas multivariate models are likely to be more fruitful. In addition, they note that prospective studies testing for statistical interaction do not provide strong or consistent evidence for the buffering hypothesis.

Turner ( 1983 ) argues that the relationship between social support and health is a reciprocating relationship where causation goes from social support to psychological well-being and in the opposite direction. It is likely that one's psychological status or condition will affect the availability of social support and one's tendency to experience that support ( Turner, et al., 1983 ). House ( 1981;51 ) suggests that "...much...of the causal flow is from social relations to health rather than vice versa". On a pessimistic note, Turner ( 1983 ) states that it is not likely that coercive evidence to fully clarify this interpretive dilemma will emerge, as no single study can provide the necessary conclusive data. In addition, longitudinal studies have determined that social support has an impact on health but cannot rule out the possible effect of some third variable on both, one that may be constitutional in origin or developmental.

Research evidence seems to indicate that support takes different forms depending on the situation and desires for

the person ( Leavy, 1983 ). The idea is that it may be appropriate to try and fit the type of support to the person and problem. Bordow & Porrit ( 1979 ) and Porrit ( 1979 ) present evidence that the amount of support required differs according to the situation. Thus some crises are easier to support than others. For example, it is more difficult to support someone who is suffering an impending death as opposed to providing support for pregnancy or parenthood. Indeed, specific aspects of social support are related to stress situations ( Norbeck, 1981 ). The emphasis seems to be on matching social support needs to situations of stress.

According to Leavy ( 1983 ) there is no assessment instrument which comprehensively measures the central component of social support. with an acceptable level of reliability or validity. Further, he claims that the relationship between social support, stress, and illness must be conceptualized as circles, loops and less as straight lines. In this way one can closely examine the ongoing interactive process via prospective longitudinal and life-span research strategies. Unfortunately, it is not always possible to operationalize such definitions. The ideal study design may not be feasible.

Other conceptualizations beside the buffering one, are that buffering effects may be limited to cases where the situation is matched by the the support type provided. Jenkins, Hurst & Rose ( 1979 ) suggests social support contrib-

utes to the adaptive capacity of the person and a lack of support can thus constitute a stressor. Antonovsky ( 1979 ) has made a similar suggestion. Thus there is a need to differentiate among specific components of social support, to consider individual as well as situational factors, that might influence psychological processes related to social support, and to match measurement procedures to theoretical conceptualizations.

Schaefer ( 1982 ) notes that statistical interactions may not be a good substitute for examining the processes involved in social support. We need to know more about the processes that occur when people use social support. The presence of social support may serve a protective function, or it may affect appraisal and coping, while support may reduce stress by mediating the appraisal. The precise operation remains to be exacted from future studies.

From these conclusions it is possible to state adequate social support may help to protect people in crisis from a wide array of pathological states. Social support interacts with environmental stress to result in better health than would otherwise be expected if social support were not present. Succinctly put, social support can make a situation "bearable or unbearable" ( Shamir & Drory, 1982 ).

## Loneliness

In addition to the actual amount of social support available, a person's subjective reaction to this support level may also be an important factor. To ensure that a person's actual social support system is taken into account, a measure of loneliness was included ( c.f. Wallston, et al., 1983; see Figure 1 ).

For instance, a person might be lonely despite being surrounded by others. Logically, a person who is lonely would be more likely to have less of a cushion against stress and thereby would suffer an increased likelihood of developing health problems, including psychosomatic symptoms and conditions. Support for this interpretation was observed in a recent study of police officers ( Vulcano, 1982 ). Those officers noted to suffer a high level of psychosomatic disorders ( same measure as the one used in the present study ) reported being lonely and having fewer social relationships.

In recent research, loneliness has been defined as a state of perceived social deficiency, where an individual's social network is rated as undesirable or dissatisfying (Gerson & Perlman, 1979). Thus, the desired and actual levels of social contact are disparate. In addition, loneliness is conceived of as being a temporary condition as well as a consistent condition. Further, loneliness is "almost

always accompanied by a sense of discomfort " (Gerson & Perlman, 1979, p.258). Loneliness, as defined for purposes of the present study, refers to a phenomenon evidenced in North American culture and this trait/state may not be evident in other cultures.

### Personality Variables

The effects of high life event stress and social support have been examined for their potential impact on physical illness. As well as a direct association between these variables and illness, studies have proposed that personality factors may be mediating the relationship between the two (e.g., Andrews & Tennant, 1978).

Personality variables have been shown to have some impact on health ( e.g., Garrity, Somes & Marx, 1977 ). As well, personality variables have been implicated as contributing independently and in combination with environmental stressors, such as life change, to the development of illness ( e.g., Rosenman, Brand, Sholtz & Friedman, 1976 ). The notion that a personality variable may be involved in the relationship between environmental stress and the development of illness has gained support from recent evidence ( cf. Totman, 1979; Johnson & Sarason, 1978; Kobasa, Maddi & Puccetti, 1982 ) and should be studied in future research ( Leavy, 1983; Eysenck, 1981 ). By way of illustration, there

has been a paucity of research that examines the relationship between personality variables and depression ( cf. Hirschfield & Klerman, 1979 ) in epidemiological surveys.

In this study, the effects of stress on psychophysiological well-being are postulated to be mediated by personality characteristics. These personality characteristics ( e.g., anxiety ) are believed to predispose an individual to certain emotional states. They may affect "appraisals and subsequent emotional reactions to various situations which then produces inadequate coping strategies that prolong stressful encounters, resulting in behavior ( such as drinking and smoking ) that is damaging to health" ( Lazarus, 1966 ). In addition, there is the potential for personality characteristics to influence whether stressful life events are encountered or avoided, and whether an appraisal of stress is made ( Cohen, 1980 ). On the other hand, stressful life experiences could influence the development of personality or these two factors could act in combination.

Another important consideration is that the occurrence of life events are stress-appraised or perceived by the individual as being stressful and because of this perception, illness is likely to develop when personality trait characteristics that are thought to produce negative emotional states are present. These personality traits or characteristics include anxiety and depression ( Cohen, 1980 ).

This section deals with the literature related to personality variables included in Figure 1, which may be involved in affecting an individual's health status. The personality factors believed to be significant predictors of health and included for examination are level of; 1) anxiety, 2) rationality, and 3) self-esteem or self-concept.

According to theory ( cf. Kobasa, et al., 1982 ), persons having low levels of rationality and self-esteem and a high level of anxiety were suggested to be less able to deal with a stressful environment. When stressful events occur these people may feel powerless and overwhelmed by their situation. Also, they were suggested to be less capable of managing and would likely have less basis for "optimistic cognitive appraisal" ( Kobasa, et al., 1982 ) in dealing with such events. Essentially, these personalities would provide little or no buffer, and as such, a stressor would be unhindered in it's impact on one's health.

### Anxiety

It has been noted that "most people respond to stressful situations with increased anxiety" (Spielberger & Sarason, 1975; 129). Scores on the trait measure of anxiety, utilized in this study, have been demonstrated to increase in response to various types of stress (Spielberger, Gorsuch & Lushene, 1970). For example, life change scores were re-

lated to several aspects of anxiety (Reavely, 1974; Lauer, 1973; Sarason & Spielberger, 1979; Vinokur & Selzer, 1975).

Pancheri, DeMartino, Spiombi, Biondi & Mosticoni (1979) assessed the utility of associating a measure of emotional reactivity with a life stress events measure. They believed that response style or personality are potential factors affecting the impact of life stress events. Pancheri, et al. (1979) noted that "the [life change] scores reflect, not so much the real impact of the event at the moment it occurs but rather the projection onto the event of the actual emotional state". The scores are believed to say something about the personality and defense structure at the time of testing. In addition, Pancheri, et al. (1979) concluded "the greatest predictive value of 'negative events' as covariables in the genesis of disease lies not so much in the negative quality of the event itself, rather, it is the emotional state of the patient that causes a negative evaluation of a neutral, or even objectively positive event. It may be hypothesized that the event elicited a persistent anxious reaction in a predisposed personality, resulting in a lasting negative evaluation" (p.194).

The trait anxiety measure that is utilized in the present study assesses "relatively stable individual differences in anxiety proneness, and indicates differences between people in the tendency to respond to situations perceived as threatening with elevations in state anxiety intensity" (Spielberger, et al. 1970; p. 3 ).

## Anxiety and Illness

Anxiety is a factor or variable which is believed to contribute to the development of illness ( Jenkins, 1976 ). Jenkins ( 1971; 1976 ) has shown there is a considerable amount of evidence that associates coronary disease with anxiety. Other studies have not provided support for a relationship between anxiety and coronary disease (e.g., Blumenthal, Thompson, Williams & Kong, 1979). As a result of their findings, Blumenthal, et al. (1979) speculated anxiety may affect an individual's health via indirect pathways.

In a similar vein, essential hypertension, considered to be a psychosomatic disorder where emotions and situational stressors play a causative or aggravating role in the disease, was found to be related to anxiety (Whitehead, Blackwell, DeSilva & Robinson, 1977). However, only some people were noted to show increases in blood pressure in response to environmental stressors. As was the case with the previous variables, the consensus suggested by much of the literature is that, anxiety produced by a stressful situation is dependent on the "cognitive appraisal" of the situation as threatening (Spielberger & Sarason, 1975).

As far as the specific outcome measures that were included in the present study are concerned, trait anxiety level was observed to be significantly related to level of psychosomatic disorder among a sample of police officers (

Vulcano, Barnes & Breen, 1983 ). Similar findings have been observed elsewhere ( Chattopadhyay, Biswas, Chatterag & Basis, 1979 ).

Anxiety has been noted to relate to depression, although the view exists that anxiety states and depression disorders belong to a single continuum of affective disturbance ( cf. Mountjoy & Roth, 1982 ). Several researchers claim it is possible to distinguish between anxiety and depression disorders although there is considerable overlap in the symptomatology ( e.g., Prusoff & Klerman, 1974 ). Roth, et al. ( 1972 ) propose them to be distinct syndromes which can be separated by factor analysis of symptoms. Further, a large number of those who suffer anxiety disorder are relatively free from depression ( Dealy, Ishik, Avery, Wilson & Dunner, 1981 ). Mountjoy & Roth ( 1982 ) found it is possible to discriminate between the two and as such they should be considered "distinct entities".

### Rationality

Another personality variable which may play a significant role as a moderator between stress and illness, and too, as a coping mechanism for stress, is level of rationality. According to rational emotive theory, cognition mediates between the stimuli and responses, as emotions and behaviours stem not only from people's reactions to their

environment, but also from their "thoughts, beliefs and attitudes about that environment" ( Ellis, 1977a; p. 3 ). More specifically, rational emotive theory suggests that emotion is caused by thinking, consequently, changing one's thinking should reduce negative emotions. Further, events by themselves are suggested not to arouse negative emotions. Instead, negative emotional states are suggested to be related to an individual's belief system regarding life events. An individual's perception of events can be either rational or irrational. If one has an irrational belief system, consequences for the individual tend to be maladaptive. Previous research has supported the rationality model ( cf. Ellis, 1977b ).

#### Rationality and Illness

Ellis & Harper ( 1961 ) postulate that irrational beliefs may causally relate to the development of depression. Depression may occur when a particular situation "triggers" an irrational belief ( Lewinsohn & Lee, 1981 ). Here, the belief causes the person to emotionally overreact to the situation. Support for this notion was offered by Knapp ( 1979 ) who concluded from study findings that the cognitive appraisal of events rather than the events themselves contribute to sustained negative emotions. Other evidence to support this can be observed from research relating irrational beliefs to depression ( e.g., Jones, 1968; Barnes & Vulcano, 1980; Vestre, 1984 ). By way of an illustration,

Vestre ( 1984 ) investigated the relationship between irrational cognition and depressed mood. Subjects completed a measure of irrational cognitions and responded daily to a depression adjective checklist for 14 to 28 days. Results showed that high levels of irrational thinking were significantly associated with greater intensity and variability of depressed mood. Vestre ( 1984 ) concluded that those who maintain irrational beliefs are more influenced by "unpleasant" events.

In addition to noting that rationality level relates to depression, other studies have linked irrationality to physical health. For example, police officers reporting high levels of psychosomatic disorders were more likely to be irrational ( ie., score high on the Barnes Vulcano Rationality Test ) relative to those reporting low levels of psychosomatic disorders ( Vulcano, Barnes & Breen, 1983 ). Also, Vulcano, et al. ( 1983 ) observed that level of rationality was significantly related to level of anxiety and the Type A coronary prone behavior pattern. From these findings, rationality level would seem to be related to both physical and mental health. In conclusion, increasing one's rationality level is believed to be a reliable and valuable method of coping and preventing psychosomatic complaints and possibly other major diseases.

## Self-Concept

A number of personality theorists postulate that the self-concept is the major, all-encompassing dimension of personality functioning ( cf. James, 1890; Rogers, 1951 ). Personal resources like self-esteem may mitigate illness outcomes by reducing occurrence of stressors or by fostering health functioning. The function of self-esteem as one that protects against environmental hardships was investigated by Wolf & Goodell ( 1968 ).

Not unlike the view of stressors and social support, there is a "lack of agreed-upon definition" of self-concept or self-esteem ( Marsh, Relich & Smith, 1983 ). Shavelson, Hubner & Stanton ( 1976 ) provide a definition that is suitable for purposes of this study; "self-concept is an individual's perception of self formed through experience with significant others, and attributions of his or her own behavior". Self-concept seems to be multidimensional with perceptions ranging from many areas in one's life; i.e., social, academic and physical components ( cf. Marsh, et al., 1983 ).

Of interest to note, because of its relationship to self-concept, is the role of reference groups. Reference groups may affect self-concepts or be of significance by establishing a frame of reference. That is, one may measure his own abilities, actions and behavior according to stan-

dards set by significant others. As such, a person may associate with a reference group that will enhance his self-concept and it is not uncommon to have multiple reference groups ( Marsh, et al., 1983 ). Thus, it is possible to understand how the valued opinion of coworkers could impact on one's work self-esteem while the relations at home would dictate the impact on that dimension of a person's self-concept. In short, those who are happy with their current life status should possess high self-esteem while those of low self-concept will be dissatisfied.

#### Self Concept and Illness

An understanding of the possible relationship between self-concept and illness, such as depression, could be gained from the following explanation. An event or series of events could create the scenario or setting for an individual to suffer self-castigation, where this self-criticism or blame may contribute to a lowering of one's self-esteem ( Beck, 1974 ). Without sources of social support to maintain or bolster one's self-esteem the effects of self-castigation elicited by an individual's perception of failure ( loss, exits, etc. ) could eventually lead to a reduced level of psychophysiological well-being. In essence, the person may see him/herself as being deficient and feel at fault and as such the individual may globalize the self criticism from the particular characteristic being blamed to the self as a whole. Then "the ultimate in self-condemnation may occur,

that is total self rejection" ( Beck, 1974; p. 11 ). It is possible then that one lowers their sense of self-worth due to negative evaluation. Data to support this relationship between depression and negative self-concept are available from Beck ( 1974; p. 18 ).

Billings & Moos ( 1982c ) see self-concept as a "personal resource" for mediating effects of stress. This process may occur as a function of a low level of rationality; that is, being unable to accurately appraise and optimistically deal with a stressful situation. One may feel powerless in a particular situation and suffer no means to improve one's self image.

From an empirical standpoint, the notion of self comes to embrace whatever one values as an important personal possession, including health, friends, honour, property, family, social standing, church membership, work, and whatever else a person may regard pridefully or importantly as his ( Klein, 1970 ). Self concept is referred to as a possessive phenomenon because of the emphasis on the self as a possessive entity, noting the constituents of the self and the kinds of emotional reactions and behavior consequences prompted by these constituents ( Klein, 1970 ). The four constituents are: 1) material, 2) social, 3) spiritual, and 4) pure ego or sense of personal identity. The emotional factors are exemplified by anxieties about illness, finances, loss and any threat to personal security as well as by

such positive self feelings as pride of accomplishment feelings of superiority and the "glow of righteousness" ( Klein, 1970 ).

Pearlin, Lieberman, Menaghan & Mullan ( 1981 ) examined low social support, coping, life events, chronic life strain and self concept influence on depression. They theorized that life events and chronic life strain lower one's self-esteem. Social support and coping may influence the risk of depression through their effect on self-concept. A low self concept would possibly be associated with the development of psychopathology, wherein the potential effects of a low self concept seem to be multifaceted. In addition, studies of personality traits of depressed patients have stressed the etiological significance of fragile self-esteem ( e.g., Chodoff, 1972 ).

In another vein, Hull & Young ( 1983 ) examined psychological antecedents of alcohol consumption. People drink for a variety of reasons, usually motivated by a social situation or for personal reasons to achieve the state that alcohol induces. For example, alcohol is consumed to reduce self-awareness especially following failure ( Hull & Young, 1983 ).

According to Brown & Crowell ( 1974 ) alcohol consumption does little to relieve tension and tends to increase self-reported social anxiety ( Steffen, Nathan & Taylor,

1974 ). However, alcohol consumption seems to decrease responsiveness to stressful situations ( Levenson, Sher, Grossman, Newman & Newlin, 1980; Wilson, Abrams & Lipscomb, 1980 ). It remains unclear whether one drinks in response to tension but alcohol consumption seems motivated by a negative affective state. Hull & Young ( 1983 ) concluded that alcohol consumption can affect one's mood, directly and indirectly via cognitive processes. Further, aberrant drinking patterns seem to be associated with personality deviance; i.e., high anxiety, depression and low self esteem level ( Brown, 1980 ). Yakichuk ( 1978 ) suggests that the qualities of alcoholic drinkers may also characterize non-alcoholic drinkers who may instead suffer from a wide assortment of mental illnesses. This study is aimed at finding at least a partial answer to this query.

Just how does alcohol consumption relate to one's self-esteem level? Poor self-concept is suspected to occur in drinkers at an early age ( cf. Barnes, 1983 ). This is evidenced by a relationship between low self-esteem and alcohol consumption in college students and teenagers. Also, partial understanding for this relationship may be gleaned from research into alcoholic drinking. Alcoholics, as defined by a high score on the Michigan Alcohol Screening Test ( Miller, 1976 ) or according to clinical group membership, view the world differently than non-alcoholics. They have a different view of their health, body, physical appearance and

sexuality ( Yakichuk, 1978 ). Their self-worth tends to be low ( cf. Vanderpool, 1969; Gross & Alder, 1970 ). According to Heilbrun & Schwartz ( 1980 ) male alcoholics neutralize this deficit by altering their self evaluation when they drink. Drinking seems to provide an alternative self-image which allows one to artificially bolster their self-esteem. In sum, it is noted to be psychologically threatening and uncomfortable when a discrepancy occurs between one's self-perception and one's perception by others.

Before proceeding to the specific hypotheses for the study, it seems relevant to first point out that examining the relationship between life event stress and illness in a multidimensional way as suggested ( cf. House, 1981 ), has at least one major implication for future life events research. Essentially, by examining whether or not the relationship between life events stress and illness can be identified with the inclusion of "buffering" or moderator variables, the conceptualization of life events as having illness precipitating capabilities is being questioned. If results from the present study support the findings from Schroeder & Costa ( 1984 ), it may then be necessary to seriously reconsider the concept of life stress. In addition, if the results of the present study indicate that there is a lack of evidence to support a relationship between life event stress and illness ( i.e., uncontaminated life events are found to be uncorrelated with illness ), it may indicate a need to construct improved life stress measures.

Hypotheses

- I) Uncontaminated life events would not be significantly related to level of depression, psychosomatic disorders, alcohol use.
- II) Contaminated life events would be significantly associated with the above criterion variables.
- III) A high level of depression would have the strongest association with high levels of anxiety and loneliness and low levels of rationality and social support as well as "neuroticism contaminated life events".
- IV) A high level of psychosomatic disorders would have the strongest association with "physical health contaminated life events", a low level of rationality, a low level of social support and a high level of loneliness.

## Method

### Sampling Frame

Questionnaires ( see Appendix A ) were administered to 303 college students. For this study there was a high participation rate, although exact non-response figures were not kept. On the average no more than five students from each of the five classes that participated in the study refused to complete the questionnaires.

### Procedure

Classes of undergraduate university students were asked to participate in the present study on a voluntary basis. It was explained to the students that they were free to discontinue participation in the study at any time. Questionnaires were administered to those students who consented to participate in this study.

Respondents were required to reply as to whether or not any of the life events ( see Appendix B ) occurred in the past 12 month period. The overall event score consists of the total number of events marked for the 12 month period. On the average, the respondents needed approximately one hour to complete the questionnaire and the respondents were not required to identify themselves in any manner.

## Measuring Instruments

Each of the members of the sampling frame received the following self-report inventories ( see Appendix A ).

1. Life Events List. This list consists of 87 items, of which 42 events are taken from the Holmes-Rahe ( 1967 ) Schedule of Recent Experience. The additional 45 items were taken from lists used by Paykel, Prusoff & Uhlenhuth ( 1971 ); Myers, Lindenthal & Pepper ( 1971 ); Dohrenwend, Krasnoff, Askenasy & Dohrenwend ( 1978 ) and Johnson & Sarason ( 1979 ). These items are the same as those utilized by Schroeder & Costa ( 1984 ). Sample items include: became married, financial worries, and death of someone dear. The range of possible scores is 0 - 87.

According to Schroeder & Costa, 1984 ) there are two categories of items, "uncontaminated" and "contaminated". In addition, there are three sub-categories or contaminated items: 1) physical health related, 2) neuroticism related, and 3) subjective events. Ratings of the contaminated and uncontaminated life events are the same as those utilized by Schroeder & Costa ( 1984 ). The complete ratings of the Life Events items are in Appendix B. Several items are not relevant to males ( e.g., pregnancy ) so the number of items for each sex differs. Possible scores

on the uncontaminated and contaminated scales range from 0 - 48 and from 0 - 43, respectively. More specifically, scores for males on the contaminated items range from 0 - 39 and on the uncontaminated, from 0 - 48; while for the females, on the contaminated items, from 0 - 43, and for the uncontaminated, from 0 - 44. For each of the three contaminated items subscales, physical health, neuroticism and subjective events, possible scores range from 0 - 16 ( 0 - 10 for males; 0 - 16 for females ), 0 - 15 ( for both sexes ), and from 0 - 12 ( again, for both males and females ).

The alpha coefficients for the uncontaminated and contaminated life event scales were computed to be .78 and .84, respectively. For the three "contaminated" subscales, the alpha values were: physical health ( alpha = .67 ), neuroticism ( alpha = .57 ) and subjective ( alpha = .73 ). Scale scores were obtained by summing the respondents total score for the items answered. A high score indicates that the respondent experienced a large number of events.

2. Social Support. A combination of two measures of social support were utilized. These include the Social Relationship Scale ( McFarlane, Neale, Norman, Roy & Streiner, 1981 ) and a procedure for surveying personal networks ( McCallister & Fischer, 1978 ). The Social Relationship Scale is designed to measure the

role of support in cushioning the effects of life stressors on health. The participant is presented with six different categories of potential areas of stress and is asked to list persons with whom they have had discussions about each of the problem areas. The problem areas include; 1) work, 2) family and home, 3) money and finances, 4) personal and social, 5) personal health, and 6) issues that relate to society in general. Subjects were asked to rate on a 5 point scale the frequency of contact they have with each individual that they list. Possible scores on these subscales range from 0 - 7. A high score indicates satisfaction with source of support. The alpha coefficient for the overall scale indicating satisfaction with social support is .89.

The procedure for measuring personal networks was designed to tap into the part of the respondents networks that most influence their attitudes, behavior and well-being ( McCallister & Fischer, 1978 ). An additive scale was calculated for this measure where a high score indicates that one has a large personal support network ( alpha = .89 ).

3. Loneliness measure ( Russell, Peplau & Cutrona, 1979 ). The scale consists of 20 items measuring general loneliness. The authors report an internal consistency coefficient alpha of .96, while Vulcano ( 1982

) obtained a reliability coefficient of .94. The range of possible scores is 0 - 80. A scale score was obtained by summing the respondent's total score for the items answered and a scale score was not computed for anyone answering less than 80% of the questions. In this study, the obtained alpha was .94. A high score indicates increased loneliness.

4. Trait measure of anxiety ( Spielberger, Gorsuch & Luschene, 1970 ). The scale consists of 20 items that ask people to describe how they generally feel. Some of the items ( e.g., "I am tense" ) are worded in such a manner that a rating of four indicates a high level of anxiety, while other items ( e.g., "I feel pleasant" ) are worded such that a high rating indicates low anxiety. In past research, this scale had a reliability value of .89 ( Vulcano, 1982 ). The range of possible scores is 20 - 80 with a high score indicating higher anxiety. A scale score was obtained by summing the respondent's total score for the items answered and a scale score was not computed for anyone answering less than 80% of the questions. For the present study alpha was .90.
5. Tennessee Self Concept Scale ( Fitts, 1965 ). The scale utilizes 100 self-descriptive items to allow an individual to portray a picture of himself. The scale provides for up to 29 different sub-dimensions including; 9 self-esteem scores ( e.g., physical

self, moral-ethical self, family self ), psychosis, personality disorder, neurosis and personality integration. According to Fitts ( 1965 ), the overall scale has a reliability of .90. Scores may range from 90 - 450 with a high score indicating a good self-concept ( alpha = .92 ).

6. Depression Inventory ( Radloff, 1977 ). Depression was measured using the CES-D Scale ( for discussion see Comstock & Helsing, 1976; Weissman, Sholomskas, Pottenger, Prusoff & Locke, 1977 ). This scale is based on items from other depression scales including those of, Beck ( Beck, et al., 1961 ), Zung ( 1965 ), the Minnesota Multiphasic Personality Inventory ( MMPI; Dahlstrom & Welsh, 1960 ), and self-report scales developed by Raskin, Schulterbrandt, Reating & McKeon ( 1969 ) and Gardner ( 1968 ). The CES-D was originally developed for use in epidemiological studies and hence is suitable for use in this study. According to Comstock & Helsing ( 1976 ) and Weissman et al. ( 1977 ) the test shows satisfactory validity and reliability.

The CES-D score is a reflection of depressive symptoms and cannot be equated with clinical diagnosis of depression. The four possible responses to each of the 20 questions are weighted 0 for "rarely or none of the time" to 3 for "most or all of the

time". Questions numbered 4, 8, 12, 16 are scored in reverse. The range of possible scores is from 0 to 60. High scores indicate both the presence and persistence of symptoms ( i.e., scores equal to or greater than 16 ). The alpha coefficient was .90.

7. Health Symptoms/Conditions inventory. This survey, developed by Schwab, Fennel & Warheit ( 1979 ) is a measure of frequently cited physical complaints most often identified with stress; for example, ulcers and hypertension. From a list of 11 symptoms/conditions that they may have experienced in the past year, respondents were instructed to indicate frequency of occurrence ( regularly, occasionally or not at all ). The items are combined to form a scale with a high score indicating poor health or greater prevalence of psychosomatic complaints than a low score ( alpha = .69 ).
8. Barnes-Vulcano Rationality Test ( BVRT ) ( Barnes & Vulcano, 1980; Barnes & Vulcano, 1982 ). The BVRT was designed to measure the 10 irrational beliefs proposed by Ellis & Harper ( 1961 ). The basic premise is that an increased level of rationality is a reliable and valuable way to cope with and prevent psychiatric illness, including psychosomatic complaints and depression. Initial reliability and validity data on this scale has shown this test to be both reliable ( alpha = .86 ) and adequate in terms

- of both convergent and discriminant validity ( Barnes & Vulcano, 1980; Barnes & Vulcano, 1982 ). The range of possible scores is 44-220 and a high score indicates irrationality (  $\alpha = .90$  ).
9. Experiences with Alcohol Survey ( taken from the Canada Health Survey, 1981 ). This measure indicates the frequency of consumption and type of alcohol consumed. Possible scores on the consumption measure (Part A-Question 3) range from 0 to 84 with a high score representing a greater consumption of alcohol. Scale scores were obtained by summing the respondent's total score for the items answered and scale scores were not computed for anyone answering less than 80% of the questions. A score on the consumption measure was not calculated for anyone who indicated that they were an "abstainer". In the present study, the coefficient of reliability,  $\alpha$ , was .76.
  10. Demographic Characteristics. Items included consisted of such variables as age and sex.
  11. Background Questionnaire. This scale consists of items taken from scales developed by each of Luborsky, Todd & Katcher ( 1973 ). Included are such items as education level, marital status, family size, and parents education. Also included were questions duplicated from the Canada Health Survey ( 1981 ) measuring participants' parents health history.

### Data Analyses

Data analysis involved calculating cross-tabulations and correlations between predictor variables and criterion variables. Hypotheses one and two were tested using correlational analyses. Following the examination of univariate relationships, multivariate data analyses were performed. Regression analysis were conducted to examine the relative importance of the predictor variables in predicting the criterion variables. The predictor variables were examined in sets ( i.e., demographic variables, environmental variables, including stressors and social support, and personality variables ) and were analyzed altogether ( Cohen & Cohen, 1975 ). Categorical variables were dummy coded for inclusion in the analyses. Multiple regression analyses were used to test Hypotheses three and four. Canonical correlation analysis technique were utilized in order to determine whether predictor variables exert similar versus different influences on the assorted variables in the dependent variable set ( Harris, 1975 ).

## Results

### Description of the Respondents

The participants in the present study consisted of 303 undergraduate university students. Women comprised 55% of this sample. The respondents ranged in age from 18 to 53 years with the mean age being 24.7. Seventy-five percent of the sample reported being single and 16% indicated that they were married. For the 48 married respondents, the mean number of years of marriage was 9.5 and they had an average of 1.5 children. The remaining 6% of the sample were separated (0.65%), divorced (1.65%), remarried (1.0%) or living common law (3.0%). The mean number of years of college education was 2.27 years.

### Descriptive Information for Study Scales

Table 1 provides descriptive information on the various scales utilized in the present study. Included are the range of scores on the scales, the mean scale score for the student sample and the standard deviation as well as the number of respondents who had scores compiled for each of the scales.

TABLE 1  
Descriptive Information for Study Scales

Predictor	Range	Mean	S.D.	N
Life Event Stress				
Physical Health	0 - 10	2.46	1.93	303
Neuroticism	0 - 15	1.54	1.63	303
Subjective	0 - 12	4.77	2.92	303
Contaminated	0 - 37	8.77	5.43	303
Uncontaminated	0 - 42	4.08	3.84	303
Total	0 - 79	12.85	8.48	303
Social Support				
Support Satisfaction	3 - 7	5.49	0.66	212
Support Network				
Total Network	1 - 48	20.1	8.65	212
Friend	0 - 24	4.96	3.42	296
Relative	0 - 17	3.98	2.59	296
Work	0 - 7	0.35	0.91	296
Other	0 - 14	0.69	1.27	296
Loneliness	20 - 76	41.61	11.82	303
Personality				
Rationality	56 - 188	115.07	20.45	293
Anxiety	21 - 70	40.29	9.07	303
Self Concept	185 - 436	330.44	37.17	301
Criterion				
Depression	0 - 56	14.26	9.93	298

Psychosomatic Disorders				
Regular	0 - 9	0.99	1.5	303
Occasional	0 - 10	3.59	2.06	303
Regular & Occasional	0 - 13	4.57	2.58	303
Drinking Level	0 - 65	6.11	8.75	195

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Note: Where 'N' deviates from 303, subjects failed to answer the questions.

Hypotheses: Life Stress and Symptoms

Table 2 shows the correlation between the uncontaminated, contaminated, total life event scales and the outcome variables. The correlations between the total number of life events experienced and each of depression, psychosomatic disorders and drinking level were .15 (  $p < .01$  ), .28 (  $p < .0001$  ) and .01 ( ns ), respectively. It would appear that life stress, as measured in the present study, is significantly associated with mental and physical health problems. Given that life stress predicts physical and mental illness, does the contaminated group of events account for this effect?

Upon examining the relationship between the uncontaminated and contaminated groups of events with each of the outcome variables, it may be noted that neither the contaminated nor the uncontaminated groups of events relates significantly to drinking level. However, it can be seen from Table 2 that the contaminated group of events ( health related, neuroticism related and subjective ) predict each of the depression and psychosomatic disorders outcome variables as well as does the total number of life events. The contaminated events do seem to account for the effect.

Of the contaminated group, the health related events were most closely associated with depression level (  $r = .27$ ;  $p < .0001$  ), where the neuroticism and subjective groups were

Table 2

Correlations of Contaminated and Uncontaminated Events  
with Depression, Psychosomatic Disorders, Level of Drinking

Event	Depression			Psychosomatic Disorders									Drinking Level		
	Male (N=131)	Female (N=164)	Overall (N=295)	Male(N=133)			Female(N=164)			Overall(N=297)			Male (N=87)	Female (N=105)	Overall (N=192)
				Reg	Occ	R & O	Reg	Occ	R & O	Reg	Occ	R & O			
Contaminated	.25 <sup>2</sup>	.20 <sup>2</sup>	.213 <sup>3</sup>	.30 <sup>3</sup>	.17 <sup>1</sup>	.31 <sup>3</sup>	.25 <sup>3</sup>	.26 <sup>3</sup>	.37 <sup>4</sup>	.27 <sup>4</sup>	.22 <sup>4</sup>	.33 <sup>4</sup>	.02	-.06	.02ns
Health Related	.32 <sup>3</sup>	.24 <sup>2</sup>	.268 <sup>4</sup>	.31 <sup>3</sup>	.04	.21 <sup>1</sup>	.25 <sup>3</sup>	.15 <sup>1</sup>	.28 <sup>3</sup>	.28 <sup>4</sup>	.10ns	.24 <sup>4</sup>	-.10	-.12	-.079ns
Neuroticism Related	.21 <sup>1</sup>	.03	.115 <sup>1</sup>	.16	.18 <sup>1</sup>	.23 <sup>2</sup>	.19 <sup>1</sup>	.25 <sup>3</sup>	.33 <sup>4</sup>	.16 <sup>2</sup>	.19 <sup>4</sup>	.24 <sup>4</sup>	.00	.06	.056ns
Subjective	.14	.18 <sup>1</sup>	.155 <sup>2</sup>	.27 <sup>3</sup>	.20 <sup>1</sup>	.32 <sup>3</sup>	.18 <sup>1</sup>	.24 <sup>2</sup>	.31 <sup>4</sup>	.23 <sup>4</sup>	.23 <sup>4</sup>	.32 <sup>4</sup>	.11	-.05	.058ns
Uncontaminated	.07	.00	.038ns	.09	.11	.14	.16 <sup>1</sup>	.11	.20 <sup>2</sup>	.11ns	.10ns	.148 <sup>2</sup>	-.06	-.01	-.007ns
Total	.18 <sup>1</sup>	.15	.153 <sup>2</sup>	.22 <sup>2</sup>	.16	.25 <sup>2</sup>	.25 <sup>3</sup>	.24 <sup>2</sup>	.35 <sup>4</sup>	.22 <sup>4</sup>	.19 <sup>3</sup>	.28 <sup>4</sup>	-.01	-.05	.01ns

- 1 p .05  
 2 P .01  
 3 p .001  
 4 P .0001

also significantly associated with depression level. The subjective group is most closely associated with level of psychosomatic disorders (  $r=.32$ ;  $p<.0001$  ), while the health and neuroticism related events were also significantly related to psychosomatic disorders.

As for the uncontaminated group of events, these do not relate significantly to depression level (  $r=.04$  ) but the combined level of regular and occasional disorders was significantly related to uncontaminated events (  $r=.15$ ;  $p<.01$  ) or, those university students reporting a high level of regular and occasional disorders experienced a high number of uncontaminated life events. Upon closer examination, it may be noted that the reported level of "regular" psychosomatic disorders as well as the reported level of "occasional" disorders was unrelated to uncontaminated life events (  $r=.11$ ; and  $r=.10$ ; respectively ). Thus, support was found for hypothesis one, that uncontaminated life events would not be significantly related to level of depression, psychosomatic disorders or alcohol use.

Checking to see if possible differences exist for men and women, the above mentioned relationships were also reported separately within gender. For men, there is a significant correlation between total life events and both depression (  $r=.18$ ;  $p<.05$  ) and psychosomatic disorders (  $r=.25$ ;  $p<.01$  ). For women, the correlation coefficients were .15, which is nonsignificant, and .35 (  $p<.0001$  ) respec-

tively. Again, for men, the significant correlations between the total life events and the criterion variables seem to be due to the relationship between the contaminated events and depression (  $r=.25$ ;  $p<.01$  ), and between the contaminated events and psychosomatic disorders (  $r=.31$ ;  $p<.001$  ). Similarly, for women, the correlation between contaminated events and depression was  $.20$  (  $p<.01$  ) and between contaminated events and psychosomatic disorders is  $.37$  (  $p<.0001$  ).

When the correlations between uncontaminated life events and the criterion variables are examined separately for males and females, it is evident that, for males, there were no significant correlations between uncontaminated events and the criterion variables. For women, the uncontaminated events do not relate to depression, but are significantly related to psychosomatic disorders (  $r=.20$ ;  $p<.01$  ). Too, for females, uncontaminated life events are significantly associated with the reporting of "regular" psychosomatic disorders (  $r = .16$ ;  $p<.05$  ) and "regular" plus "occasional" disorders (  $r = .20$ ;  $p<.01$  ), but not with "occasional" disorders alone (  $r = .11$ ; ns ). However, in comparison to these correlations, it is noteworthy that the correlation between contaminated events and psychosomatic disorders is higher (  $r=.37$ ;  $p<.0001$  ). As far as life stress relating to mental and physical illness, the contaminated group of events, as opposed to the uncontaminated events, seems to account for the effect.

Partial support was observed for the second hypothesis, that contaminated life events would be significantly associated with the criterion variables. Contaminated life events were significantly associated with depression level and level of psychosomatic disorders, however, as mentioned, contaminated life events were observed to be unrelated to drinking level. Specifically, depressed individuals reported a greater number of contaminated life events in comparison to those respondents who were not depressed (  $r = .21$ ;  $p < .0002$  ). Individuals who indicated that they suffered from regular and occasional disorders combined, also reported experiencing a large number of contaminated life events (  $r = .33$ ;  $p < .0001$  ). Similarly, those who reported experiencing "regular" psychosomatic disorders as well as "occasional" psychosomatic disorders were more likely to have experienced contaminated life events (  $r = .27$ ;  $p < .0001$  and  $r = .22$ ;  $p < .0001$ , respectively ). All of these relationships were significant for each of males and females separately ( see Table 2 ).

According to hypothesis three, a high level of depression should have the strongest association with high levels of anxiety, loneliness, irrationality, "neuroticism" contaminated life events and low levels of social support. Being depressed was associated with a high level of anxiety (  $r = .73$ ;  $p < .0001$  ), having a low self-concept (  $r = -.65$ ;  $p < .0001$  ) and being critical of one's self (  $r = .14$ ;  $p < .02$

). Being depressed was also associated with the respondents age (  $r = -.17$ ;  $p < .003$  ) and with being dissatisfied with one's social support system (  $r = -.26$ ;  $p < .0002$  ), having a smaller personal support network (  $r = -.20$ ;  $p < .0005$  ), being lonely (  $r = .53$ ;  $p < .0001$  ), irrational (  $r = .63$ ;  $p < .0001$  ) and experiencing contaminated life events (  $r = .27$ ;  $p < .0002$  ) including "physical health" related events (  $r = .27$ ;  $p < .0001$  ), "neuroticism" related events (  $r = .12$ ;  $p < .05$  ) and "subjective" events (  $r = .16$ ;  $p < .01$  ).

In order to test the relative magnitude of the predictors in explaining depression, psychosomatic disorders and drinking level, simple multiple regression analysis technique was employed. Interaction effects were also examined.

Initially, 55 variables were entered into a regression equation and these included second order interactions. These included moderator variables, personality variables and demographic variables.

For the depression criterion variables, these 55 variables accounted for 65% of the explained variance. It was possible to reduce the number of variables entered into the regression analyses as the majority of these did not account for a large amount of variance. Therefore, a parsimonious solution was reached.

Partial support was found for hypothesis three, that a high level of depression would have the strongest association with high levels of anxiety, loneliness, irrationality, "neuroticism" contaminated life events and low levels of social support. Table 3 lists three predictors that account for 63% of the variance.

According to hypothesis four, a high level of psychosomatic disorders should have the strongest association with "physical health" contaminated life events, a low level of rationality, a low level of social support and a high level of loneliness. Among the students, a high level of psychosomatic disorders was associated with experiencing a large number of contaminated life events ( $r=.33$ ;  $p<.0001$ ), including each of physical health related events ( $r=.24$ ;  $p<.0001$ ), neuroticism related events ( $r=.24$ ;  $p>.0001$  and subjective events ( $r=.32$   $p<.0001$ ), being female ( $r=.21$ ;  $p<.0003$ ), being irrational ( $r=.24$ ;  $p<.0001$ ), and having a large number of relatives in one's personal support network ( $r=.19$ ;  $p<.0008$ ).

A high level of psychosomatic disorders was also associated with having a large personal support network ( $r=.16$ ;  $p<.01$ ), being lonely ( $r=.16$ ;  $p<.01$ ), anxious ( $r=.24$ ;  $p<.0001$ ) and having a low self-concept ( $r=-.21$ ;  $p<.0001$ ). In addition, those respondents who indicated that their mother and father suffered a large number of illnesses were more likely to report a high level of regular

TABLE 3

Regression Coefficients, R-Square &amp; F-Values for Depression

Variable	Depression		
	R-Square Change	B-Value	F
Anxiety	.593	.61	82.1 <sup>2</sup>
Self-Concept	.031	-.07	19.33 <sup>2</sup>
Self-Criticism	.008	-.16	4.11 <sup>1</sup>
Overall	.632 (d.f.= 3,202)		115.59 <sup>2</sup>

Note: 1  $p < .05$   
 2  $p < .0001$

TABLE 4

Regression Coefficients, R-Square &amp; F-Values for Psychosomatic Disorder

Variable	Psychosomatic Disorders		
	R-Square Change	B-Value	F
Contaminated Life Events	10.0	.13	25.56 <sup>3</sup>
Gender	4.9	1.03	13.89 <sup>2</sup>
Irrationality	3.1	.03	13.49 <sup>2</sup>
Number of Relatives in Social Support Network	1.8	.14	6.37 <sup>1</sup>
Overall	19.8	(d.f.=4,281)	17.31 <sup>3</sup>

Note: 1 p<.05  
 2 p<.001  
 3 p<.0001

and occasional psychosomatic disorders (  $r = .19$ ;  $p < .001$  and  $r = .19$ ;  $p < .001$  ).

For the psychosomatic disorders criterion variable, the original 55 variables accounted for 23% of the explained variance. Upon reducing the number of predictor variables, because they failed to account for a significant portion of the variance, a solution was reached which has four variables in the regression equation.

Partial support was found for hypothesis four, that a high level of psychosomatic disorders would have the strongest association with "physical health contaminated" life events, a low level of rationality, a low level of social support and a high level of loneliness. Table 4 lists four predictors that account for 19.8% of the explained variance.

For the drinking level or alcohol consumption criterion variable, the original 55 predictors accounted for 16% of the explained variance. A parsimonious solution was reached as most of these were accounting for a very small amount of the explained variance of drinking level. Table 5 lists two predictors, gender ( being male ) and having a low level of satisfaction with one's social support system, that account for 13.9% of the variance for the drinking level criterion variable.

From the multiple regression analyses it is apparent that no interaction effects are accounting for a significant

proportion of explained variance in the outcome variables, i.e., the uncontaminated life stressors do not seem to interact with social support or personality variables to predict mental and/or physical illness.

TABLE 5

Regression Coefficients, R-Square &amp; F-Values for Drinking Level

Variable	Drinking Level		
	R-Square Change	B-Value	F
Gender	11.8	-5.7	15.58 <sup>2</sup>
Satisfaction With Social Support	2.1	-2.0	3.49 <sup>1</sup>
Overall	13.9	(d.f.=2,143)	11.51 <sup>2</sup>

Note: 1 p&lt;.07

2 p&lt;.0001

### Canonical Correlations

Utilizing canonical correlation analysis it was possible to examine whether or not the predictor variables related similarly or differently to each of the criterion measures. Before presenting the canonical correlation analysis it would seem appropriate to examine the correlations among the criterion variables. A high level of psychosomatic disorders was moderately related to a high depression level (  $r = .26$ ;  $p < .0001$  ) but the level of psychosomatic disorders was unrelated to drinking level (  $r = .02$  ). Similarly, depression level was unrelated to drinking level (  $r = -.05$  ).

According to a canonical correlation analysis ( Harris, 1975 ), there were significant correlations between the canonical variate pairs. The maximum number of canonical correlations is indicated by the smallest set of variables being examined. That is, there are three criterion variables so there can be as many as three canonical variate pairs ( Harris, 1975 ).

The statistical test for the first pair of canonical variables indicated that the canonical correlation (  $\rho = .82$  ) was significant (  $F = 10.96$ ;  $p < .00001$ ;  $d.f. = 24, 389.24$  ). The significant canonical correlation between the first pair of predictor and criterion canonical variables seems to be comprised of a factor that may be described as a high anxiety, low self-concept score and a high depression

score. This may be labelled as a "general maladjustment-depression" factor. Further testing proved that the second and third pairs were also significantly correlated (  $\rho = .46$ ;  $F = 4.08$ ;  $p < .00001$ ; d.f. = 14, 270 and  $\rho = .37$ ;  $F = 3.57$ ;  $p, .003$ ; d.f. = 6, 136 ). Despite this, the second and third pairs contributed only a small amount of explained variance.

The standardized weight vectors or the composition of the canonical variables are as follows ( see Table 6 ). The first canonical variable pair for the "predictor" variables may be represented as a weighted difference of (.68)anxiety + (-.34) self-concept + (.18)contaminated life events + (-.16)number of relatives in one's personal support network. From Table 6 it can be seen that the other predictor variables ( irrationality, being critical of one's self, sex, and satisfaction with social support ) which were significant predictors in the regression analyses, seem to contribute very little to this first canonical variable. The standardized canonical coefficients of the variables contributing to the "criterion" canonical variable were: (.98)depression + (.09)psychosomatic disorders + (.02)drinking level.

According to the canonical correlation for the first pair (.82), a high score on the predictor canonical variable is associated with a high score on the criterion canonical variable. The predictor variables contributing to a high

TABLE 6  
Standardized Canonical Coefficients

	Pair 1	Pair 2	Pair 3
<u>Predictors</u>			
Anxiety	.6808	-.0957	-.4075
Rationality	-.0234	-.0682	.2040
Self-Concept	-.3361	.0941	-.0103
Self Criticism	-.0222	-.0423	.2128
Contaminated Life Events	.1791	.7218	.3088
Gender	.0012	.6731	.4121
Personal Support Network (relatives)	-.1578	.3361	.41212
Satisfaction with Social Support	-.0111	.0007	-.4085
<u>Criterion Variables</u>			
Depression	.9762	-.3184	-.1278
Psychosomatic Disorders	.0885	.8667	.5532
Drinking Level	.0155	-.5958	.8101

score on the predictor canonical variable were: a high score on both the anxiety scale and the contaminated life events scale along with, to a lesser extent, a low score on the self-concept scale and a low score on the measure indicating the number of relatives in one's personal support network. The anxiety variable made the largest contribution to this canonical variable with self-concept contributing approximately one-half as much and, each of the contaminated life events variable and the personal network variable contributed approximately one-quarter as much. Correspondingly, a high score on the criterion canonical variable seems to be largely contributed to by a high score on the depression scale.

From Table 6, the standardized canonical coefficients of the variables contributing to the second predictor canonical variable are as follows: (.72)contaminated life events + (.67)sex + (.34) personal network. Also, from Table 6, it can be seen that each of the remaining variables in the predictor set, personality variables; anxiety, irrationality and self-concept along with being critical of one's self and satisfaction with social support, contribute little to the canonical variable. Contributing to this second canonical variable were a high score on the contaminated life events measure, being female and, to a lesser extent, a high score on the variable measuring the number of relatives in one's personal support network. The contaminated life events

variable and the sex variable contributed an equal amount to this canonical variable, while the personal support variable contributed approximately one-half as much as either of these. The criterion canonical variable for the second pair was contributed to by  $(.87)$  psychosomatic disorders +  $(-.60)$  drinking level +  $(-.32)$  depression.

The third canonical variable for the predictor measures is comprised of  $(-.50)$  sex +  $(-.41)$  satisfaction with social support  $(-.41)$  anxiety +  $(.41)$  number of relatives in one's personal support network as well as being critical of one's self  $(.21)$  +  $(.20)$  irrationality. The third canonical variable for the criterion measures is comprised of  $(.81)$  drinking level +  $(.55)$  psychosomatic disorders +  $(-.13)$  depression.

The standardized canonical coefficients outlined in Table 6 indicate that each of the three canonical pairs are differently comprised. This is illustrated by the size of the weights for each of the variables. For example, depression  $(.98)$  contributes the most to the criterion canonical variable in the first pair, while drinking level  $(.81)$  has the largest weight in the third canonical variable ( see Table 6 ).

It is possible to interpret the first canonical correlation according to the canonical redundancy analysis, which provides the proportion of the variance of each set of vari-

ables that is explained by their own canonical variables and the opposite canonical variables. The general interpretation of the first canonical correlation is that the first pair of canonical variables is a moderately good predictor of the opposite set of variables, as the proportions of variance explained were 22% and 24.6% ( see Table 7 ). That is, the predictor canonical variable explained 22% of the variance of the criterion canonical variable and the criterion canonical variable explained 24.6% of the predictor canonical variable. Also from Table 7, it can be seen that the second and third canonical variables add a little to the explained variance of the opposite sets, with the cumulative proportions for all three canonical variables being 26.7% and 35.4%. The second and third canonical variables do not add much to the explained variance of the criterion variables, 2.5% and 2.2%, respectively. The second and third criterion canonical variables add 6.2% and 4.7% respectively to the explained variance of the predictor canonical variables, or an additional 11%.

Table 8 shows the squared multiple correlation for these canonical variables. The squared multiple correlations indicate that the first canonical variable of the predictor measurements has good predictive power for anxiety(.59), self-concept(.49) and irrationality(.47). By contrast, the first canonical variable of the predictor measurements has poor predictive power for contaminated life

TABLE 7

## Proportion of Standardized Explained Variance

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Standardized Variance of the Predictor Variables Explained by  
the Opposite Canonical Variables

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	Proportion -----	Cumulative Proportion -----
Predictor Pair 1	.2199	.2199
Predictor Pair 2	.0252	.2450
Predictor Pair 3	.0222	.2673
<hr/>		
Criterion Pair 1	.2463	.2463
Criterion Pair 2	.0615	.3078
Criterion Pair 3	.0466	.3544

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events(.11) and almost none for the remaining four variables. The first canonical variable of the criterion measurements is a good predictor of depression(.67) and is a poor predictor of psychosomatic disorders(.07), and drinking level(.003).

Table 8 also shows that the second and third predictor canonical variables predict, fairly well, albeit similarly, the personality variables, and to a lesser extent, the contaminated life events variable. A pattern of prediction is evident for the criterion canonical variable, where depression is best predicted in each case. For the second canonical variable, psychosomatic disorders(.19) is predicted less well in comparison to the power to predict depression(.67). As was the case in the first canonical variable, drinking level is not at all well predicted. For the third canonical variable, depression(.67) is well predicted with psychosomatic disorders(.24) and drinking level(.16) showing better predictability.

In summary, according to the canonical correlation analysis, all three predictor canonical variables are similar in their ability to predict the criterion canonical variables and vice versa ( see Table 8 ). The "personality" or "general maladjustment" component ( as indicated by a high anxiety, irrationality score and a low self-concept score ) would seem to be associated with a high level of depression. The life event stress effect, as measured in the

TABLE 8  
Squared Multiple Correlations

	Canonical Pair 1	Canonical Pair 2	Canonical Pair 3
<hr/>			
Predictor Variables			
Anxiety	.5859	.5860	.5863
Rationality	.4678	.4684	.4698
Self-Concept	.4921	.4935	.4964
Self-Criticism	.0458	.0465	.0638
Contaminated Life Events	.1080	.1848	.2048
Gender	.0001	.0804	.1313
Personal Support (relatives)	.0201	.0576	.0909
Satisfaction with Social Support	.0392	.0431	.0948
Criterion Variables			
Depression	.6664	.6672	.6677
Psychosomatic Disorders	.0698	.1937	.2359
Drinking Level	.0027	.0626	.1596

present study, does not seem to predict different criteria or outcomes among different people.

## Discussion

It must be noted that the data in the present study were collected utilizing a cross-sectional self report methodology. There are advantages to using a self report methodology. Gathering of data by self report is economical, does not require extensive rater/observer training and observer bias is avoided, however, the methodological shortcomings associated with self-report information have been well documented ( e.g., Stone, et al., 1980 ). In addition to issuing this caution, it must be stated that no causal arguments are made here. Etiological inferences based on cross-sectional data are problematic, and as such, the findings in this study are to be viewed with these limitations in mind.

Discussion of the findings related to the study hypotheses involves addressing four central issues. These issues are: 1) does life stress predict physical and mental health problems? 2) If so, does contamination account for the effect? 3) If contamination accounts for the effect is there still a possible role for uncontaminated life stressors in interaction effects with other variables? 4) Does the life event stress effect still exist but predict different criterion or outcomes in different people?

## Hypotheses

### Objective One

Upon examining the present study's first objective, life event stress was found to be significantly associated with mental and physical health problems. Although life event stress was significantly related with the depression and psychosomatic disorders outcome variables, the association was weak (see Table 2). This finding is consistent with the correlations shown in a variety of studies (cf: Dohrenwend and Dohrenwend, 1974). Even though life event stress predicts physical and mental illness, the question remains which group, the uncontaminated or contaminated, accounts for this effect (cf: Schroeder and Costa, 1984)? According to the findings of the present study, the uncontaminated group of events did not significantly relate to depression and drinking level, nor were they significantly associated with either of the reported levels of "regular" or "occasional" disorders. These findings provide support for hypothesis one, that uncontaminated life events would not be significantly associated with level of depression, psychosomatic disorders, or alcohol use. These findings are consistent with those of Schroeder and Costa (1984).

Further, the contaminated group of events (health related, neuroticism related and subjective) predict each of the depression and psychosomatic disorders outcome variables

as well as does the total number of life events, but were not significantly associated with drinking level. This is not that surprising as one realizes that an individual may not respond to stress by increased alcohol use. As this was the case, partial support was found for hypothesis two that contaminated life events would be significantly associated with depression, psychosomatic disorders, and alcohol use. Again, these findings are consistent with the results obtained by Schroeder and Costa (1984).

Upon separately examining, for males and females, the correlations between the uncontaminated events and criterion measures as well as those between the contaminated events and criterion measures, the pattern of results is consistent with the aforementioned. In the case where, among women, uncontaminated events correlated significantly with women's level of psychosomatic disorders, it is relevant to point out that the correlation magnitude is greater between the contaminated events and psychosomatic disorders.

As the findings of the present study are consistent with those observed by Schroeder and Costa (1984), one is led to the conclusion that the contaminated items in life events lists inflate the correlation between life stress and illness. The contaminated events seem to account for the effect. If the uncontaminated events had been significantly related to one of the mental or physical illness measures one would be less likely to confirm this notion.

## Objective Two

Since the contaminated measures seem to account for this effect, a second objective of the present study was to consider the potential role of social support and personality, while examining the relationship between life event stress and illness. By doing so, the present study attempted to overcome Lloyd's (1980) criticism that no investigator has simultaneously examined personality, stress, and social support. It is relevant to consider the potential role of these variables, as social support has been suggested to act as a moderator of the potential effects of life event stress. As well, it is relevant to consider the role that one's personality might play in the relationship between life event stress and illness. Just as a "neurotic" individual (cf: Schroeder and Costa, 1984) may differentially perceive his/her environment, relative to someone who is not neurotic, an "anxious" or "irrational" person could also have an altered or distorted perception of his/her environment. In their endeavor to uncover the true nature of the relationship between stress and illness, Schroeder and Costa (1984) failed to measure social support or other personality variables besides neuroticism. By examining these dimensions and their possible interactions with stress events, the present study is an extension of their research design.

In essence, then, if contamination accounts for the significant association between life stress and illness measures, does it remain possible that the uncontaminated life stressors interact with other variables to account for any effects? In order to answer this question and deal with this possibility, multiple regression analyses were undertaken. Regression analyses allowed the identification of the relative importance of each of the life stressor, social support, and personality variables, including the interaction of these, in predicting the outcome measures.

#### Depression

Partial support was found for hypothesis three, that a high level of depression will have the strongest association with high levels of anxiety and loneliness, and with low levels of rationality, social support, as well as "neuroticism contaminated life events". Upon examining the correlation magnitudes as indicators of the strength of association between the predictor and criterion variables, anxiety, self-concept, and irrationality showed the strongest relationship to depression. Social support and neuroticism contaminated life events did not relate as strongly.

According to the regression analyses, the anxiety variable was by far the single best predictor as it accounted for 59% of the explained variance. These findings were not surprising as previous studies indicate that individuals who

report experiencing depression also were likely to indicate that they were experiencing anxiety ( cf. Gotlib, 1984 ). Specifically, significant correlations between measures of depression and anxiety have been observed among university students ( e.g., Krantz & Hammen, 1979 ). As discussed, university students have many reasons to be anxious. They could be anxious about doing well in university and concerned with what lies ahead for them in their future. Generally, they may be anxious about whether or not their future will be prosperous and they may be concerned as to whether or not a university education is going to serve as a vehicle to a better quality of life.

Depression and anxiety have been suggested to be highly interrelated emotional states, and measures of these appear to assess "general psychological distress" rather than independent constructs ( Gotlib, 1984 ). This is important to note as depressed university students have been used as an analogue to investigate clinical depression among psychiatric patients. Individuals in nonclinical populations, i.e., university students, suffering from depression, are hypothesized to represent the low end of a continuum of severity, where clinical depression is at the opposite end of this dimension. If the current anxiety and depression measures are actually assessing a unitary construct it is necessary to be cautious when drawing conclusions about the development of depression.

In addition, if one reported a low self concept, relative to scoring high on the self concept scale, they were more likely to be depressed. This variable contributed 3% to the explained variance of depression. The findings of the present study are consistent with Fitts ( 1972 ) suggestion that those with low self concepts would be more likely to suffer high levels of anxiety and depression. Fitts ( 1972 ) provided evidence that self concept, as measured by the Tennessee Self Concept Scale, is associated with mental health. Specifically, according to Fitts ( 1972 ), self concept reflects "degree of pathology" and types of psychopathology. Further, he suggests that individuals unable to cope with stress are those with a low self concept. Inability to cope would affect their mental health, although in the present study, there was no evidence that students suffered depression due to an inability to cope with stress.

The self concept variable emerged as a significant predictor of depression even though loneliness and irrationality were also strongly correlated with the mental health outcome measure. This is probably due to the fact that self concept was highly correlated with each of loneliness and irrationality. In the present study, anxiety, self concept, loneliness and irrationality were observed to be significantly interrelated. This is not surprising as loneliness has been observed to be significantly associated with anxiety ( Gotlib, 1984 ). Gotlib ( 1984 ) utilized the same

measures of anxiety and loneliness as were employed in the present study.

Lastly, another aspect of self concept, that being self-criticism emerged as a predictor of depression. If one is critical of him/herself then he/she is more likely to report being depressed in comparison to one who is not self critical.

In conclusion, three variables accounted for a large portion of the explained variance of depression. Interaction variables did not emerge as significant predictors of the mental illness measure.

#### Psychosomatic Disorders

In addition to including a mental illness measure, the present study explored a measure of physical illness. Doing so allowed the assessment of the relative importance of the demographic, moderator, and personality variables, including interaction effects, in predicting psychosomatic disorders.

Partial support was observed for hypothesis four that a high level of psychosomatic disorders would have the strongest association with "physical health contaminated" life events, a low level of rationality, a low level of social support, and a high level of loneliness. With the exception of the social support variable, all of these variables were significantly associated with level of psychosomatic disorders.

From the regression analyses, four predictors emerged that accounted for 20% of the explained variance of psychosomatic disorders. Contaminated life events contributed 10%, gender accounted for another 5%, rationality level provided 3%, while number of relatives in one's personal support network explained an additional 2% of the variance. More specifically, those who report a large number of contaminated life events indicate that they suffer from a high level of psychosomatic disorders. Women, in comparison to men, are more likely to suffer psychosomatic disorders. Students who are irrational and who have a large number of relatives in their personal support network seem to experience a greater number of psychosomatic disorders, relative to those who are rational and students with fewer relatives in their personal support network.

A possible explanation as to why these variables emerge as significant predictors of psychosomatic disorders is that these predictors may combine to form a neuroticism component. This explanation is illustrated by noting that a large number of relatives might provide an outlet for the students' complaints. Although having a large number of relatives in one's social support network might serve as people to complain to, this complaining may not alleviate the disorder. None of the interaction variables emerged as significant predictors of physical illness.

## Alcohol Use

In the present study testing of this notion that stress may relate to high levels of alcohol consumption produced low correlations between the predictor variables and the drinking level outcome measure. Further, only two variables emerged as significant predictors of the drinking level criterion measure. The significant predictors were gender (being male), which accounted for 12% of the explained variance; and having a low level of satisfaction with one's social support system contributed another 2%. Simply put, in comparison to women, men seemed more likely to consume large amounts of alcohol. This finding is consistent with the known evidence that, in relation to women, men are three to four times as likely to be "heavy" drinkers, that is, consume fourteen or more drinks per week (Canada Health Survey, 1981).

Since four times as many males as females, aged 25-45, in the Canadian general population, consume alcohol in larger quantities, it is not surprising that, in the present study, being male was the best predictor of university students drinking level. This finding coincides with the assertion that males live a "riskier" lifestyle as indicated by their propensity to drink, on the average, larger amounts of alcohol on a weekly basis relative to female drinkers. In one respect it might be expected that female university

students would consume amounts in parity with their male counterparts. This suggestion stems from the expectation that, regardless of gender, university students would be expected to consume equal amounts of alcohol.

In addition, those who are dissatisfied with their social support system seem inclined to drink more in comparison to those who are satisfied with their social support system. This finding was interpreted as indicating that one may seek additional social support; support that is thought to be available in a social setting, and provided by drinking in groups, e.g., going to a bar or pub.

It would seem that students do not drink in order to gain relief from life stress, nor do they drink in response to high anxiety levels. In addition, even though personality and environmental factors have been proposed as predictors of drinking level ( Winstead, Whitworth & Lawson, 1981 ), the findings of the present study did not support this notion.

The tension reduction hypothesis states that alcohol serves to reduce tension, and that this tension reduction reinforces the drinking response ( Conger, 1956 ). Although equivocal findings have been evidenced, Steffen, Nathan & Taylor ( 1974 ) found a significant correlation between increasing blood alcohol level and decreasing tension level, which is consistent with the tension reduction hypothesis.

This hypothesis may not be a major factor in the etiology of the development of alcoholism but it seems to have merit in explaining moderate drinking in social situations among college students.

Generally, students seem to drink for positive versus negative reasons. Research on alcohol consumption in college populations has indicated that students drink to amplify positive affect rather than to compensate for negative affective states. For example, Schwartz, Burkhart, and Green (1978) found that sensation seeking was more salient in students' motivational set regarding alcohol use than was tension reduction. Also, alcohol consumption seems greater when subjects were in a positive rather than a depressing environmental situation ( e.g., Russel & Bond, 1979 ).

As alcohol consumption seemed associated with positive settings and factors, it is not surprising that the personality correlates examined in the present study failed to predict drinking level. Indeed, findings have indicated that, in college students, sensation seeking traits, such as experience seeking and disinhibition, are among the best available personality indicators of drinking behavior ( e.g., Segal, Huba & Singer, 1980 ). As well, according to Ratliff & Burkhart ( 1984 ), men state more negative or escapist reasons for drinking than did women. Men and women have differential expectations regarding the effects of alcohol. Men expect arousal and potentially aggressive behav-

ior, while women expect drinking to enhance social enjoyment.

Another consideration to explain the poor predicatability of the variables included in the present study is that alcohol consumption may be beneficial for remedying some problems but not others. For example, it may be useful to drink in response to job stress, but not in response to marital problems or family discord or life events in general. These specific aspects were not examined in detail in this study and they may indicate a need for further investigation.

Too, the effect of life events may be different for various levels of alcohol consumption. For example, moderate drinking may buffer stress effects and mediate the relationship between life events and depression. Evidence for this has been offered by Neff & Husaini ( 1982 ).

In short, drinking is normative behavior among university students. This is apparent from prevalence figures found in previous studies and in the present study. For example, Wechsler & McFadden ( 1979 ) reported as many as 95% of college students drink, while 90% of the present sample classified themselves as drinkers.

Finally, it was suspected that the interactions between uncontaminated life stress events and other variables included in the present study, might predict mental and physi-

cal illness. However, the interaction variables failed to account for a significant proportion of the explained variance of the outcome measures. One possible reason for the interaction variables proving to be non-significant predictors of depression, psychosomatic disorders and alcohol use, could be that the variables included were not the best possible predictors. Other variables to be studied include internal-external locus of control and sensation seeking.

For example, Johnson & Sarason ( 1978 ) found that internal-external locus of control mediated the relationship between life event stress and depression. In addition, the degree to which a subject feels that an event was "controllable" versus "uncontrollable" has been suggested to relate to illness ( Cochrane & Robertson, 1973 ). By way of an illustration, "marriage" is designated as a controllable event, while "death" is an uncontrollable event. These events may differentially impact on one's health. According to Fairbank & Hough ( 1979 ), an external orientation of an event being out of one's control seems to predict symptoms.

Another reason for no interaction effects being observed in the present study is that there is a need for improved measures. Although the reliability and validity of the measures utilized in the present study were acceptable ( i.e., Cronbach's alpha was usually above .80 ), there are problems associated with paper and pencil self report measures ( cf. Stone, et al., 1980 ). A likely possibility to

explain the lack of interaction effects is that life stressors do not predict illness very well, and the contaminated events seem to account for this effect.

In conclusion, it would seem that the uncontaminated events do not significantly predict illness, nor do they interact with social support or personality variables to predict depression or psychosomatic disorders. In order to completely discount the possibility that the uncontaminated events interact with other variables to produce mental and/or physical illness, other aspects of one's personality and social support system may need to be examined.

### Objective Three: Canonical Correlation

A third objective of this study was to acknowledge that individuals may react differently to stress. It is suggested that stress may differentially impact on one's health. That is, life event stress may affect one person's physical health (represented in this study by level of psychosomatic disorders), while impacting upon another person's mental health (represented in this case by a measure of depression), and another person's behavior (i.e., alcohol use). In other words, does the life event stress effect still exist but predict different outcomes in different people?

Life event stress has been shown to relate to both physical and mental illness (cf: Jenkins, 1976). In the

present study, life event stress was observed to be related to both depression and psychosomatic disorders, however the contaminated events seem to be accounting for this effect. Utilizing canonical correlation analysis it was possible to examine whether or not the predictor variables ( demographic, life stress, social support, and personality variables ) related similarly or differently to each of the outcome measures. This analysis indicated a moderately significant correlation between the canonical variates. The predictor canonical variate can be described as a high anxiety, low self-concept factor, while the criterion canonical variate consisted of a high depression component. This canonical relationship was labelled a "general maladjustment- depression" factor.

Referring to the canonical redundancy analyses ( see Table 7 ), which provides the proportion of the variance of each set of variables that is explained by their own canonical variables and the opposite canonical variables, it is possible to interpret the first canonical correlation. The first pair of canonical variables is a moderately good predictor of the opposite set of variables. This was the case as the predictor canonical variable explained 22% of the variance of the criterion canonical variable, and the criterion canonical variable explained approximately 25% of the predictor canonical variable. Analyzing the correlation of the second and third canonical pairs shows that they add

little to the explained variance of the opposite set. In addition, each of the second and third pairs predict similarly, not differently. That is, for all three canonical correlations, depression is predicted better than psychosomatic disorders or drinking level ( see Table 8 ). The general maladjustment component is best associated with a high level of depression. According to this analysis, the variables utilized in the present study may not be the best predictors of the criterion measures but they would seem to offer a moderate degree of predictability. There would seem to be little support for a differential relationship between the predictor and criterion variables, and it is evident that life event stress is not a significant predictor of the outcome variables. Contaminated life events do predict slightly but for each canonical pair, they were better predictors of depression level than level of psychosomatic disorders or drinking level.

Lastly, it may be worth noting that depression level was significantly associated with level of psychosomatic disorders, even though the correlation was small. This correlation may indicate that people become depressed or develop psychosomatic disorders while a few show signs of both. Further, it may be the case that the low correlation is due to psychiatric disorders preceding the onset of physical illness. That is, one might not be simultaneously afflicted by depression and psychosomatic disorders but progress from

experiencing depression to suffering from psychosomatic disorders ( Murphy and Brown, 1980 ). Schwab and Traven ( 1979 ) indicated that those who had high anxiety and depression scores also became psychosomatically ill.

By contrast, Goldberg, Comstock, and Hornstra ( 1979 ) suggest it is unlikely that depressed mood is related to subsequent physical illness. The results of the present study support this notion. Even though anxiety and depression were slightly but significantly related to psychosomatic disorders, anxiety was not a significant predictor of psychosomatic disorders.

It could be that the development of physical illness is possibly related to pre-existing health problems. According to the present study findings, parents' poor physical health was slightly but significantly associated with level of psychosomatic disorders. There may be a genetic component that manifests itself in the etiology of physical illness, or that contributes to an individual's vulnerability to illness.

The life event stress effect, as measured in the present study, does not seem to predict different criterion or outcome measures among different people. In addition, the predictors employed in this study relate moderately to depression, but not as well to psychosomatic disorders or drinking level. Other predictors may be better able to ac-

count for the development of these. For example, Monroe, Imhoff, Wise & Harris ( 1983 ), upon finding that a "life event by social support interaction" significantly predicted health disturbance, concluded that different support variables may be important for certain subgroups of individuals.

### Reconceptualization of Life Stress

As far as the relationship between life stress and illness is concerned, the findings of the present study suggest two possibilities. One possibility is that life stress does not predict illness, while the second possibility is that life event stress is inadequately conceptualized. This also means that life event stress is inappropriately operationalized i.e., life event lists or life stress measures are incomplete.

The first possibility seems unlikely in that contrary evidence exists to countermand this conclusion. Events that occur during one's lifetime (e.g., bereavement and natural disasters) have been found to elicit elevated rates of morbidity and mortality (cf: Dohrenwend and Dohrenwend, 1978). In addition, Brown (1981), in a prospective design study, showed that a single event had the ability to promote depression onset in 50% of women participants. Due to the existence of conflicting evidence, instead of concluding that no relationship exists between life stress and illness, it

would be better to surmise that it is necessary to reconceptualize life stress.

Current conceptualizations of a stressor's ability to invoke illness involve a three step process (e.g Selye, 1956). First, an event is perceived as a threat to an individual. This perception produces physiological arousal. Second, the event requires an individual to utilize resources to cope with the threat. Third, the individual succumbs to the stress represented by the event as his/her resources are exhausted. An individual subsequently develops or exhibits a form of illness. This conceptualization is inadequate as Schroeder and Costa (1984) aptly point out, since most of the items contained in life events lists fail to produce the reactions outlined above. The failure of the events to elicit such reactions is likely due to individual's successfully dealing with them as they occur. Schroeder & Costa ( 1984 ) conclude that the items retained in the life stressor checklist do not actually serve to measure stress that requires an individual to utilize coping resources.

Lazarus (1966) offers an alternative to the aforementioned approach. Stress is said to occur as a function of the ongoing exchange or "transaction" between an individual and his/her environment. Here, stress is defined as having occurred "when the environmental circumstances exceed the individual's capabilities to cope". As suggested by Schroe-

der and Costa (1984), if stress is defined in this manner there may be greater evidence of its potential impact on one's health than is manifested by current definitions of life stress.

This suggestion is well taken but a related practical consideration is the problem of operationalizing or measuring stress according to its revised conceptualization. Measuring stress, as it is conceptualized in its revised form, means being able to measure one's ability to cope in addition to other factors. These other factors include moderators of stress such as social support, personality type, as well as financial resources (cf: Schroeder and Costa, 1984). That is, in order to assess an event's ability to impact on one's health, one must also be able to measure or evaluate other intermediary stages of the illness development process.

Current models ( e.g., Kagan & Levi, 1974 ) of stress-illness relationships note the following components. Upon assessing a situation as stressful, "coping" and "reappraisal" may take place. An individual's ability to cope will be related to his/her social support system, financial resources, and perhaps personality type. In order to identify the effects of a stressor one must be able to separate these from the other components. To do this successfully, one must be able to measure satisfactorily each of the components e.g. coping ability, social support system, personali-

ty type. If adequate measurement of these is not feasible, then it may only be possible to infer that stress relates to illness (cf: Schroeder and Costa, 1984).

In essence, the successful assessment of an event's ability to promote illness depends upon being able to adequately measure other processes in the development of illness. The assessment/measurement of these indicators has not been perfected, and development is slow. For example, social support measures have only recently been identified and developed ( cf: Billings and Moos, 1981; Turner et al, 1983 ) .

Too, if an event is inferred to be stressful on the basis of its effects, i.e., physical and mental symptomatology, then the relationship between stress and illness becomes "circular". If one suffers ill health he/she may be more inclined to assess or perceive an event as being stressful. Also, as Schroeder and Costa (1984) point out, certain types of individuals may perceive their environment as one which provides a chronic source of distress. These types tend to include those who are "high in neuroticism" but are not limited to these, since other personality types may be related to the development of specific illnesses.

Future studies need to employ a prospective design which involves participants who are healthy. Doing so will avert the possibility that an "ill" subject, versus a "well"

subject, will be inclined to negatively perceive events in the environment. This design will contribute to reducing the circularity and inference involved in relating stress to illness.

Returning to the original issue, as the contaminated events seem to predict illness, a revised conceptualization of stress is needed. Measurement of stress according to this revised conceptualization is quite difficult, and to do this adequately requires the satisfactory measurement of other components outlined in stress-illness models.

Before proceeding to a specific suggestion of how to improve life event measures it seems relevant to briefly outline criticisms of current instruments. Aside from the obvious criticism that lists contain contaminated items, the methodological issues include: 1) poor reliability and validity, 2) additivity assumption, 3) need for prospective/longitudinal designs, 4) use of suitable control groups, 5) need for collaborative evidence, 6) quantification of the importance of events, and 7) need to exclude inappropriate events.

The reliability and validity of life events scales have been observed to be poor ( cf. Rabkin & Struening, 1976 ). This is suggested to be due partially to the "vagueness" of the questions and the failure to probe the respondent further. This criticism suggests the need for interviewer

based instruments which would allow for further probing of events and for specialization of event lists.

Another critique of the life event lists is that the effects of life events are assumed to be additive (Brown and Harris, 1978). Brown and Harris (1978) determined that this is not necessarily the case. Further, Brown (1981) argues that weighting life event scores does little to alter the relationship between the life event score and the outcome measure.

Utilizing a longitudinal panel design it would be possible to identify event and illness onset dates. This would ensure that an event preceded an illness and help eliminate the circularity and inference regarding event-illness relationships.

In addition, by employing two groups, one of which is "illness free", it will be possible to ascertain how illnesses may be maintained as opposed to being induced. Monroe (1982) suggested that it is necessary to recognize that subsequent to illness onset, events may contribute to illness "maintenance". For some individuals an event can promote or maintain an existing illness while for others, their illness may go into "remission". Also, these groups should be representative, and not gained from hospital samples. Hospital patients are not representative of the general population.

Another concern in attempting to establish a relationship between life events and illness is the need for collaborative or supportive evidence. Use of collaborative evidence would reduce the subjectivity of self reports and aid in the confirmation of event/illness occurrence.

Use of collaborative evidence would also aid in the quantification of the importance of each type of event. As has been documented, the importance of an event or its ability to impact on one's health is tied to an individual's perception of that event. However, an individual may deny the importance of an event. This denial may be identified and taken into account upon utilizing collaborative reports.

Lastly, events that are possible consequences of illness should be excluded from consideration as precipitants of illness. For example, 29 or 43 Social Readjustment Rating Scale items fall into this category.

These considerations are relevant when trying to reformulate how to adequately measure/operationalize the revised conceptualization of life stress. Adequate measures of stress should include non-event items and the list should be specialized or specific to a domain of the individual.

Non-event items are suggested to have illness promoting capabilities ( Lazarus & DeLongis, 1983 ). By way of an illustration, not receiving an anticipated promotion is likely to be perceived by an individual in a manner similar to many

"events". That is, not receiving an anticipated promotion would likely be stressful to an individual. Other general non-event items include, being turned down for a bank loan and failing to be hired for a job. The inclusion of this type of item would increase the comprehensiveness of life stress measures.

Also, potential non-event items would be dictated by the specific domain of an individual. That is, different groups would experience different events/non-events. One's job or occupation would be a major consideration in the potential events/non-events to be encountered. For example, doctors, nurses, patients, students and housewives, experience some common events, however, much that occurs or fails to occur within these different domains is specific. To illustrate, generally the daily encounters of a physician would be quite different than those experienced by a housewife. However, it is likely that, within their respective domains, each of them would perceive specific events/non-events as stressful. For a housewife, a stressful non-event might be that she is unable to go out and work, which would provide time away from raising children. For a physician, the daily routine of treating patients, one after the other, might be straining and stressful.

In summary, event lists tend to include inappropriate items. In addition, these lists are not comprehensive enough and they should be specific for different groups ac-

according to a domain of the individual. Specifically referring to the present study, the life stress measure utilized was a limited one. It did not include a specific list of stressors encountered by students. The list failed to incorporate many aspects of a student's life which might be stress related and consequently capable of impacting on a student's health.

### Conclusion

The findings of the present study indicate that there is little if any relationship between life stress and reported level of depression or psychosomatic disorders. This was suggested to be as a result of methodological problems. In the future, there is a need to reconceptualize stress and measure it differently, including utilizing longitudinal designs. Further study with a revised life stress list and other social support and personality measures than those included here, should elucidate the nature of the stress-illness relationship, and the use of alcohol in human subjects.

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Appendix A

A

## ATTITUDES AND OPINIONS SURVEY

Dear Participant:

This questionnaire is a research project designed to determine your attitudes and opinions on various topics. While participation in this project is voluntary, accurate results cannot be obtained without your cooperation. I think that you will find the questionnaire to be both, interesting and stimulating. The project is being conducted by Mr. Brent Vulcano, under the supervision of Dr. Lawrence Breen, Department of Psychology, The University of Manitoba.

You will notice that your name does not appear anywhere on the questionnaire. Also, you should not sign the questionnaire. We are not concerned with the answers of any individual but with the answers of all respondents grouped together. Your own answers will be kept strictly confidential, and will not be divulged or connected back to you under any circumstances. Results will be reported in statistical form.

Please read the questions carefully and answer with your own opinions and to the best of your knowledge. If you have any questions about any of the questionnaire please feel free to enquire.

Thank you for your cooperation.

Note whether or not any of the following events have happened to you in the past 12 months by rating the impact of the event, if it occurred, on a scale from 1 to 100. For example, if you "quit your job", on a scale of 1 to 100, with "100" being the highest rating, how important was the event to you.

Event	Value
1. Marriage	_____
2. Troubles with the boss	_____
3. Detention in jail or other institution	_____
4. Death of spouse	_____
5. Major change in sleeping habits (a lot more or a lot less sleep, or change in part of day when asleep)	_____
6. Death of a close family member	_____
7. Major change in eating habits (a lot more or a lot less food intake, or very different meal hours or surroundings)	_____
8. Foreclosure on a mortgage or loan	_____
9. Revision of personal habits (dress, manners, associations, etc.)	_____
10. Death of a close friend	_____
11. Minor violations of the law (e.g., traffic tickets, jaywalking, disturbing the peace)	_____
12. Outstanding personal achievement	_____
13. Pregnancy	_____
14. Major change in the health or behavior of a family member	_____
15. Sexual difficulties	_____
16. In-law troubles	_____
17. Major change in number of family get-togethers (e.g., a lot more or a lot less than usual)	_____
18. Major change in financial state (e.g., a lot worse off or a lot better off than usual)	_____
19. Gaining a new family member (e.g., through birth, adoption, oldster moving in)	_____
20. Change in residence	_____

Event	Value
21. Son or daughter leaving home (e.g., marriage, attending college)	_____
22. Marital separation from mate	_____
23. Major change in church activities (e.g., a lot more or a lot less than usual)	_____
24. Marital reconciliation with mate	_____
25. Being fired from work	_____
26. Divorce	_____
27. Changing to a different line of work	_____
28. Major change in the number of arguments with spouse (e.g., either a lot more or a lot less than usual regarding child-rearing, personal habits)	_____
29. Major change in responsibilities at work (e.g., promotion, demotion, lateral transfer)	_____
30. Wife beginning or ceasing work outside the home	_____
31. Major change in working hours or conditions	_____
32. Major change in usual type and/or amount of recreation	_____
33. Taking on a mortgage greater than \$10,000 (e.g., purchasing a home, business)	_____
34. Taking on a mortgage or loan less than \$10,000 (e.g., purchasing a car, TV, freezer)	_____
35. Major personal injury or illness	_____
36. Major business readjustment (e.g., merger, reorganization, bankruptcy)	_____
37. Major change in social activities (e.g., clubs, dancing, movies, visiting)	_____
38. Major change in living conditions (e.g., building a new home, remodeling, deterioration of home or neighborhood)	_____
39. Retirement from work	_____
40. Vacation	_____
41. Graduation	_____
42. Changing to a new school	_____
43. Starting a new job	_____
44. Job demotion	_____

Event	Value
45. Laid off from job	_____
46. Unemployed for at least a month	_____
47. Quit your job	_____
48. Enlisted in the Armed Forces	_____
49. Left the Armed Services	_____
50. Became engaged	_____
51. Broke off an engagement	_____
52. Began or ceased steady dating	_____
53. Menopause	_____
54. You or your wife or girlfriend had an unwanted pregnancy	_____
55. Birth of a first child	_____
56. Birth of a second or later child	_____
57. Miscarriage	_____
58. Adoption of child	_____
59. Death of child	_____
60. Death of a parent	_____
61. Death of a sibling	_____
62. Severe illness or injury to an immediate family member	_____
63. Last child left home	_____
64. Child discovered to be taking illegal drugs	_____
65. Child dropped out of school	_____
66. Family member was in trouble with law	_____
67. Other troubles with your children	_____
68. Parent put in nursing home	_____
69. Divorce of a parent	_____
70. Problems with parents	_____
71. Car had to be replaced	_____
72. You sued or were sued by someone in court	_____

Event	Value
73. Burglary in your house	_____
74. Robbery or mugging	_____
75. Won or inherited substantial money or property	_____
76. Repossession of merchandise	_____
77. Falling behind in payments on a loan or mortgage	_____
78. Credit rating difficulties	_____
79. Argument or fight with close friend or neighbor	_____
80. Were hospitalized	_____
81. Major improvement in health	_____
82. Difficulty in obtaining treatment for illness or injury	_____
83. Eyesight failing	_____
84. Poorer hearing	_____
85. Major dental work	_____
86. Traffic accident	_____
87. Change in religious affiliation	_____













Who would care for your home if your family went out of town? (List name and relationship to you.)

Who, if anyone, has helped with household tasks in the last 3 months?

With whom do you engage in social activities (like inviting home for dinner, or going to a movie)?

Whose advice do you consider in making important decisions?

From whom would you or could you borrow a large sum of money from?

Have you left someone out that is important to you?

Directions. For the following questions you are to circle the choice that best illustrates how often each of the statements would be descriptive of you.

O represents "I often feel this way."

S represents "I sometimes feel this way."

R represents "I rarely feel this way."

N represents "I never feel this way."

	<u>often</u>	<u>sometimes</u>	<u>rarely</u>	<u>never</u>
1. I am unhappy doing so many things alone.	0	S	R	N
2. I have nobody to talk to.	0	S	R	N
3. I cannot tolerate being so alone.	0	S	R	N
4. I lack companionship.	0	S	R	N
5. I feel as if nobody really understands me.	0	S	R	N
6. I find myself waiting for people to call or write.	0	S	R	N
7. There is no one I can turn to.	0	S	R	N
8. I am no longer close to anyone.	0	S	R	N
9. My interests and ideas are not shared by those around me.	0	S	R	N
10. I feel left out.	0	S	R	N
11. I feel completely alone.	0	S	R	N
12. I am unable to reach out and communicate with those around me.	0	S	R	N
13. My social relationships are superficial.	0	S	R	N
14. I feel starved for company.	0	S	R	N
15. No one really knows me well.	0	S	R	N
16. I feel isolated from others.	0	S	R	N
17. I am unhappy being so withdrawn.	0	S	R	N
18. It is difficult for me to make friends.	0	S	R	N
19. I feel shut out and excluded by others.	0	S	R	N
20. People are around me but not with me.	0	S	R	N

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

	almost never	sometimes	often	almost always
1. I feel pleasant.	(1)	(2)	(3)	(4)
2. I tire quickly.	(1)	(2)	(3)	(4)
3. I feel like crying.	(1)	(2)	(3)	(4)
4. I wish I could be as happy as others seem to be.	(1)	(2)	(3)	(4)
5. I am losing out on things because I can't make up my mind soon enough.	(1)	(2)	(3)	(4)
6. I feel rested.	(1)	(2)	(3)	(4)
7. I am "calm, cool and collected".	(1)	(2)	(3)	(4)
8. I feel that difficulties are piling up so that I cannot overcome them.	(1)	(2)	(3)	(4)
9. I worry too much over something that really doesn't matter.	(1)	(2)	(3)	(4)
10. I am happy.	(1)	(2)	(3)	(4)
11. I am inclined to take things hard.	(1)	(2)	(3)	(4)
12. I lack self-confidence.	(1)	(2)	(3)	(4)
13. I feel secure.	(1)	(2)	(3)	(4)
14. I try to avoid facing a crisis or difficulty.	(1)	(2)	(3)	(4)
15. I feel blue.	(1)	(2)	(3)	(4)
16. I am content.	(1)	(2)	(3)	(4)
17. Some unimportant thought runs through my mind and bothers me.	(1)	(2)	(3)	(4)
18. I take disappointments so keenly that I can't put them out of my mind.	(1)	(2)	(3)	(4)
19. I am a steady person.	(1)	(2)	(3)	(4)
20. I get in a state of tension or turmoil as I think over my recent concerns and interests.	(1)	(2)	(3)	(4)
21. I drink because of job pressures.	(1)	(2)	(3)	(4)

## TENNESSEE SELF CONCEPT SCALE

The statements in this inventory are to help you describe yourself as you see yourself. Please respond to them as if you were describing yourself to yourself. Do not omit any item! Read each statement carefully; then select one of the five responses listed below. Erase completely any answer you wish to change and mark your new answer.

Responses:	Completely false (CF) ...1	Mostly false (MF) 2 (MF)	Partly false and partly true ...3 (PF,PT)	Mostly true (MT) 4 (MT)	Completely true (CT) ...5	<u>CF</u>	<u>MF</u>	<u>PF,PT</u>	<u>MT</u>	<u>CT</u>
1. I have a healthy body.						1	2	3	4	5
2. I am an attractive person.						1	2	3	4	5
3. I consider myself a sloppy person.						1	2	3	4	5
4. I am a decent sort of person.						1	2	3	4	5
5. I am an honest person.						1	2	3	4	5
6. I am a bad person.						1	2	3	4	5
7. I am a cheerful person						1	2	3	4	5
8. I am a calm and easy-going person.						1	2	3	4	5
9. I am a nobody.						1	2	3	4	5
10. I have a family that would always help me in any kind of trouble.						1	2	3	4	5
11. I am a member of a happy family.						1	2	3	4	5
12. My friends have no confidence in me.						1	2	3	4	5
13. I am a friendly person.						1	2	3	4	5
14. I am popular with men.						1	2	3	4	5
15. I am not interested in what other people do.						1	2	3	4	5
16. I do not always tell the truth.						1	2	3	4	5
17. I get angry sometimes.						1	2	3	4	5
18. I like to look nice and neat all the time.						1	2	3	4	5
19. I am full of aches and pains.						1	2	3	4	5
20. I am a sick person.						1	2	3	4	5
21. I am a religious person.						1	2	3	4	5
22. I am a moral failure.						1	2	3	4	5
23. I am a morally weak person.						1	2	3	4	5
24. I have a lot of self-control.						1	2	3	4	5
25. I am a hateful person.						1	2	3	4	5
26. I am losing my mind.						1	2	3	4	5
27. I am an important person to my friends and family.						1	2	3	4	5
28. I am not loved by my family.						1	2	3	4	5
29. I feel that my family doesn't trust me.						1	2	3	4	5
30. I am popular with women.						1	2	3	4	5

	CF	MF	PF	MT	CT
31. I am mad at the whole world.	1	2	3	4	5
32. I am hard to be friendly with.	1	2	3	4	5
33. Once in a while I think of things too bad to talk about.	1	2	3	4	5
34. Sometimes, when I am not feeling well, I am cross.	1	2	3	4	5
35. I am neither too fat nor too thin.	1	2	3	4	5
36. I like my looks just the way they are.	1	2	3	4	5
37. I would like to change some parts of my body.	1	2	3	4	5
38. I am satisfied with my moral behavior.	1	2	3	4	5
39. I am satisfied with my relationship to God.	1	2	3	4	5
40. I ought to go to church more.	1	2	3	4	5
41. I am satisfied to be just what I am.	1	2	3	4	5
42. I am just as nice as I should be.	1	2	3	4	5
43. I despise myself.	1	2	3	4	5
44. I am satisfied with my family relationships.	1	2	3	4	5
45. I understand my family as well as I should.	1	2	3	4	5
46. I should trust my family more.	1	2	3	4	5
47. I am as sociable as I want to be.	1	2	3	4	5
48. I try to please others, but I don't overdo it.	1	2	3	4	5
49. I am no good at all from a social standpoint.	1	2	3	4	5
50. I do not like everyone I know.	1	2	3	4	5
51. Once in a while, I laugh at a dirty joke.	1	2	3	4	5
52. I am neither too tall nor too short.	1	2	3	4	5
53. I don't feel as well as I should.	1	2	3	4	5
54. I should have more sex appeal.	1	2	3	4	5
55. I am as religious as I want to be.	1	2	3	4	5
56. I wish I could be more trustworthy.	1	2	3	4	5
57. I shouldn't tell so many lies.	1	2	3	4	5
58. I am as smart as I want to be.	1	2	3	4	5
59. I am not the person I would like to be.	1	2	3	4	5
60. I wish I didn't give up as easily as I do.	1	2	3	4	5
61. I treat my parents as well as I should. (Use past tense if parents are not living.)	1	2	3	4	5
62. I am too sensitive to things my family say.	1	2	3	4	5
63. I should love my family more.	1	2	3	4	5
64. I am satisfied with the way I treat other people.	1	2	3	4	5
65. I should be more polite to others.	1	2	3	4	5
66. I ought to get along better with other people.	1	2	3	4	5
67. I gossip a little at times.	1	2	3	4	5

	CF	MF	PT PF	MT	CT
68. At times I feel like swearing.	1	2	3	4	5
69. I take good care of myself physically.	1	2	3	4	5
70. I try to be careful about my appearance.	1	2	3	4	5
71. I often act like I am "all thumbs".	1	2	3	4	5
72. I am true to my religion in my everyday life.	1	2	3	4	5
73. I try to change when I know I'm doing things that are wrong.	1	2	3	4	5
74. I sometimes do very bad things.	1	2	3	4	5
75. I can always take care of myself in any situation.	1	2	3	4	5
76. I take the blame for things without getting mad.	1	2	3	4	5
77. I do things without thinking about them first.	1	2	3	4	5
78. I try to play fair with my friends and family.	1	2	3	4	5
79. I take a real interest in my family.	1	2	3	4	5
80. I give in to my parents. (Use past tense if parents are not living.)	1	2	3	4	5
81. I try to understand the other fellow's point of view.	1	2	3	4	5
82. I get along well with other people.	1	2	3	4	5
83. I do not forgive others easily.	1	2	3	4	5
84. I would rather win than lose in a game.	1	2	3	4	5
85. I feel good most of the time.	1	2	3	4	5
86. I do poorly in sports and games.	1	2	3	4	5
87. I am a poor sleeper.	1	2	3	4	5
88. I do what is right most of the time.	1	2	3	4	5
89. I sometimes use unfair means to get ahead.	1	2	3	4	5
90. I have trouble doing the things that are right.	1	2	3	4	5
91. I solve my problems quite easily.	1	2	3	4	5
92. I change my mind a lot.	1	2	3	4	5
93. I try to run away from my problems.	1	2	3	4	5
94. I do my share of work at home.	1	2	3	4	5
95. I quarrel with my family.	1	2	3	4	5
96. I do not act like my family thinks I should.	1	2	3	4	5
97. I see good points in all the people I meet.	1	2	3	4	5
98. I do not feel at ease with other people.	1	2	3	4	5
99. I find it hard to talk with strangers.	1	2	3	4	5
100. Once in a while I put off until tomorrow what I ought to do today.	1	2	3	4	5

Instructions for questions. Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way during the past week by circling the appropriate alternative.

- 0...rarely or none of the time (less than 1 day)
- 1...some or a little of the time (1-2 days)
- 2...occasionally or a moderate amount of time (3-4 days)
- 3...most or all of the time (5-7 days)

1.	I was bothered by things that usually don't bother me.	0	1	2	3
2.	I did not feel like eating; my appetite was poor.	0	1	2	3
3.	I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4.	I felt that I was just as good as other people.	0	1	2	3
5.	I had trouble keeping my mind on what I was doing.	0	1	2	3
6.	I felt depressed.	0	1	2	3
7.	I felt that everything I did was an effort.	0	1	2	3
8.	I felt hopeful about the future.	0	1	2	3
9.	I thought my life had been a failure.	0	1	2	3
10.	I felt fearful.	0	1	2	3
11.	My sleep was restless.	0	1	2	3
12.	I was happy.	0	1	2	3
13.	I talked less than usual.	0	1	2	3
14.	I felt lonely.	0	1	2	3
15.	People are unfriendly.	0	1	2	3
16.	I enjoyed life.	0	1	2	3
17.	I had crying spells.	0	1	2	3
18.	I felt sad.	0	1	2	3
19.	I felt that people dislike me.	0	1	2	3
20.	I could not get "going".	0	1	2	3

INSTRUCTIONS. Below you will find a number of symptoms and conditions relating to your health. Please indicate in the appropriate space with a checkmark those symptoms/conditions which you have experienced in the past year. For example, if you have experienced headaches regularly, but only experienced a nervous stomach on occasion in the past year, you would mark the check list as follows:

	Yes (regularly)	Yes (occasionally)	No
Nervous stomach	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Headache	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please note any other symptoms/conditions in the space provided which are not listed here.

	Yes (regularly)	Yes (occasionally)	No
<u>Symptoms</u>			
headaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
indigestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
constipation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
nervous stomach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
stomach aches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Conditions</u>			
hypertension (high blood pressure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ulcers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
colitis (inflammation of the colon)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
weight trouble:			
too heavy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
too thin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
weight fluctuates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other symptoms/conditions			
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Alcohol. The following questions are about your experiences with alcohol.

PART A.

1. In the last twelve months, about how often have you taken at least one drink of beer, wine, liquor, or any other alcoholic beverage?
- two or more times a day;
  - once a day;
  - 4 to 6 times a week
  - 2 or 3 times a week
  - about once a week
  - 2 or 3 times a month
  - about once a month

IF YOU HAVE CONSUMED LESS OFTEN THAN ONCE A MONTH, PLEASE GO DIRECTLY TO PART B.

2. Not counting small sips, at what age did you start drinking alcoholic beverages?  
At age \_\_\_\_\_

3. Beginning with yesterday, how many drinks did you have on each of the last 7 days?

	no drinks	1	2 or 3	4 to 7	8 to 11	12 or more
Yesterday	( )	( )	( )	( )	( )	( )
2 days ago	( )	( )	( )	( )	( )	( )
3 days ago	( )	( )	( )	( )	( )	( )
4 days ago	( )	( )	( )	( )	( )	( )
5 days ago	( )	( )	( )	( )	( )	( )
6 days ago	( )	( )	( )	( )	( )	( )
7 days ago	( )	( )	( )	( )	( )	( )

4. Has your drinking changed over the last 12 months?
- drinking more now
  - drinking less now
  - no change over last 12 months

5. What do you usually drink?  
(check one only)
- beer
  - wine
  - liquor or mixed drinks
  - other
  - it varies

6. Over the last 12 months, has your drinking played a part in any of the following problems?
- |  |  |
|--|--|
| <input type="checkbox"/> tension or disagreement with family or friends? | <input type="checkbox"/> trouble at work or school?                  |
| <input type="checkbox"/> difficulties with driving?                      | <input type="checkbox"/> problems with your health?                  |
| <input type="checkbox"/> accidental injury to yourself or someone else?  | <input type="checkbox"/> trouble with the law?                       |
|  | <input type="checkbox"/> violent injury to yourself or someone else? |
|  | <input type="checkbox"/> None of these                               |

Alcohol. PART B (The following questions are about your experience with alcohol.)

1. I drink/drank  
 less often than once a month  
 not at all in the last 12 months

The following table might help you answer some of these questions.

One drink equals...

one pint bottle of beer (12 ounces)

one small glass of wine (4-5 oz.)

one shot of liquor or spirits (1 - 1-1/2 ounces) with or without mix

A shot with a beer chaser or a double should be counted as two drinks.

2. (a) At what age did you start? At age \_\_\_\_\_.  
(b) At what age did you have your last drink? At age \_\_\_\_\_.
3. About how often did you usually drink?  
 two or more times a day       about once a week  
 once a day       2 or 3 times a month  
 4 to 6 times a week       about once a month  
 2 or 3 times a week       less often than once a month
4. About how many drinks did you have at a time?  
 one  
 two or three  
 four or five  
 six or seven  
 more than that
5. What did you usually drink?  
(Check one only)  
 beer  
 wine  
 liquor or mixed drinks  
 other  
 it varied
6. Were there any particular reasons why you stopped drinking?  
(Please check all appropriate boxes)  
 close friend or spouse did not drink  
 it was affecting my health  
 joined the A.A.  
 had a bad experience because of drinking  
 it was a source of conflict with family or friends  
 didn't drink much and decided to quit  
 it was too expensive  
 thought that I could use my time better  
 it was affecting my job, studying or homemaking  
 no particular reason

## DEMOGRAPHIC DATA & BACKGROUND INFORMATION

Instructions: Please answer every question in this section; please do not omit any questions. Mark questions that do not apply with N/A.

Please write in your answers to each of the questions which require you to do so.

1. Your age (to the nearest whole year)\_\_\_\_\_.
2. Are you male\_\_\_\_\_or female\_\_\_\_\_?
3. What is your marital status?
  - a. married\_\_\_ b. single\_\_\_ c. separated\_\_\_ d. divorced\_\_\_
  - e. widowed\_\_\_ f. remarried\_\_\_ g. common-law\_\_\_
4. Were you born in Canada?
  - a. Yes\_\_\_ b. No\_\_\_
5. What is your ethnic background?
  - a. Asian/Oriental\_\_\_ b. White\_\_\_ c. Black\_\_\_ d. Indian/Native\_\_\_
  - e. Ukrainian\_\_\_ f. Italian\_\_\_ g. Other, specify\_\_\_\_\_
6. What...if any...is your religious preference?
  - a. Protestant\_\_\_ b. Catholic\_\_\_ c. Jewish\_\_\_ d. None\_\_\_
  - e. Other, specify\_\_\_\_\_
7. When not attending university, do you usually live?
  - a. in the city\_\_\_ b. in a town\_\_\_ c. in a rural area\_\_\_
8. Do you:
  - a. own your home\_\_\_ b. rent your home or apartment\_\_\_
  - c. live with parents or relatives\_\_\_
9. Do you live in:
  - a. a private house\_\_\_ b. an apartment\_\_\_

10. What did your father do for a living while you were growing up?  
Please describe briefly \_\_\_\_\_
11. What did your mother do for a living while you were growing up?  
Please describe briefly \_\_\_\_\_
12. Are you a high school graduate? \_\_\_\_\_
13. How many years of college have you completed? \_\_\_\_\_ Did you graduate? \_\_\_\_\_
14. If yes, type of degree: \_\_\_\_\_ Major: \_\_\_\_\_

If you are currently married, could you answer the following:

14. How many years have you been married? \_\_\_\_\_
15. How many children do you have? \_\_\_\_\_ Their ages: \_\_\_\_\_
16. How did you meet your spouse? \_\_\_\_\_
17. Is your spouse now going to school? \_\_\_\_\_ If yes, at what level? \_\_\_\_\_
18. Is your spouse a high school graduate? \_\_\_\_\_
19. How many years of college has s/he completed? \_\_\_\_\_ Did s/he graduate? \_\_\_\_\_
20. How many years of graduate work has s/he completed? \_\_\_\_\_
- Advanced degree: \_\_\_\_\_ Major field: \_\_\_\_\_

Family History. These questions are about a few aspects of your parent's health.

1. Did your father ever have any of the following?

	<u>yes</u>	<u>no</u>	<u>not sure</u>
heart trouble	( )	( )	( )
high blood pressure	( )	( )	( )
a stroke	( )	( )	( )
diabetes	( )	( )	( )
cancer	( )	( )	( )

2. Is your father now living?

( ) yes ( ) no

If your answer is 'no':

(a) at what age did he die? At age \_\_\_\_; ( ) don't know

(b) what was the cause of death?

( ) heart trouble

( ) a stroke

( ) diabetes

( ) cancer

( ) other: please specify: \_\_\_\_\_

( ) don't know

3. Did your mother ever have any of the following:

	<u>yes</u>	<u>no</u>	<u>not sure</u>
heart trouble	( )	( )	( )
high blood pressure	( )	( )	( )
a stroke	( )	( )	( )
diabetes	( )	( )	( )
cancer	( )	( )	( )

4. Is your mother now living?

( ) yes ( ) no

If your answer is 'no':

(a) at what age did she die? At age \_\_\_\_; ( ) don't know

(c) what was the cause of death?

( ) heart trouble

( ) stroke

( ) diabetes

( ) cancer

( ) other: please specify: \_\_\_\_\_

( ) don't know

My mother is

- (1) living
- (2) died when I was over 20 years old
- (3) died when I was 16-20 years old
- (4) died when I was 10-15 years old
- (5) died when I was 6-9 years old
- (6) died before I was 6 years old

My father is

- (1) living
- (2) died when I was over 20 years old
- (3) died when I was 16-20 years old
- (4) died when I was 10-15 years old
- (5) died when I was 6-9 years old
- (6) died before I was 6 years old

When you were growing up, which, if any, of the following illnesses did your mother have (please circle)?

arthritis  
bladder trouble  
diabetes  
heart condition  
neuralgia or sciatica  
epilepsy  
skin condition  
asthma  
colitis  
hay fever  
high blood pressure  
nervous breakdown  
stomach trouble

When you were growing up, which, if any, of the following illnesses did your father have? (please circle)

arthritis  
bladder trouble  
diabetes  
heart condition  
neuralgia or sciatica  
epilepsy  
skin condition  
asthma  
colitis  
hay fever  
high blood pressure  
nervous breakdown  
stomach trouble

## Appendix B

### Ratings of Life Event Items

For the 42 items from the Holmes-Rahe Schedule of Recent Experience (using the item numbers from Holmes & Masuda, 1974, pp. 48-49), items 5, 7, 15 and 35 were rated as being related to physical health; items 2, 3, 8, 11, 16, 22, 25, and 26 as related to neuroticism; and items 9, 12, 14, 17, 18, 23, 28, 29, 31, 32, 37, and 38 as subjective. Items 1, 4, 6, 10, 19, 20, 21, 24, 27, 30, 33, 34, 36, 39, 40, 42 and 43 were rated as being uncontaminated by the three influences, and item 13 was rated as health-related for women and uncontaminated for men.

The ratings for the 45 additional items follow:

#### Uncontaminated

- 43. Started a new job.
- 45. Laid off from job.
- 46. Unemployed for at least a month.
- 47. Quit your job.
- 48. Volunteered for the Armed Services.
- 49. Left the Armed Services.
- 50. Became engaged.
- 51. Broke off an engagement.
- 52. Began or ceased steady dating.

58. Adoption of child.
59. Death of child.
60. Death of a parent.
61. Death of a sibling.
62. Severe illness or injury to an immediate family member.
63. Last child left home.
64. Child discovered to be taking illegal drugs.
65. Child dropped out of school.
66. Family member was in trouble with law.
68. Parent put in nursing home.
69. Divorce of a parent.
71. Car had to be replaced.
72. You sued to were sued by someone in court.
73. Burglary in your house.
74. Robbery or mugging.
75. Won or inherited substantial money or property.
86. Traffic accident.
87. Change in religious affiliation.

Contaminated ( P = related to physical health;  
N = related to neuroticism; S = subjective )

44. Job demotion. (N)

53. Menopause. (P for women; does not pertain to men)
54. You or your wife or girlfriend had an unwanted pregnancy. (P for women; uncontaminated for men)
55. Birth of a first child. (P for women; uncontaminated for men)
56. Birth of a second or later child. (P for women; uncontaminated for men)
57. Miscarriage. (P for women; does not pertain to men)
67. Other troubles with your children. (N)
70. Problems with parents. (N)
76. Repossession of merchandise. (N)
77. Falling behind in payments on a loan or mortgage. (N)
78. Credit rating difficulties. (N)
79. Argument or fight with close friend or neighbor. (N)
80. Were hospitalized. (P)
81. Major improvement in health. (P)
82. Difficulty in obtaining treatment for illness or injury. (P)
83. Eyesight failing. (P)
84. Poorer hearing. (P)
85. Major dental work. (P)