

THE UNIVERSITY OF CALGARY

ECONOMIC RISK AND SYMPTOMATOLOGY:  
AN INVESTIGATION OF ECONOMIC VARIABLES AT THE INDIVIDUAL LEVEL

by

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## ABSTRACT

The effect of environmental and economic stress at the individual level on psychiatric symptomatology was assessed using the Economic, Demographic and Social Characteristics Questionnaire (EDSCQ) (MacFadyen & MacFadyen, 1984). The primary purpose of this study was to investigate the relationship between economic risk, environmental risk, and symptomatology using the economic psychology model. Further, the study also investigated the ability of the EDSCQ to differentiate between groups (normal, out-patient, in-patient) who differed in terms of behavioral cost. It was hypothesized that there was an association between increased environmental risk and economic risk and increased self-reported symptomatology as measured by the Symptom Check List (Derogatis, 1977; Derogatis, Lipman, & Covi, 1973) and Brief Symptom Inventory (Derogatis, 1975). Economic risk and environmental risk, in general, were found to be positively associated with behavioral cost as reflected by sample group. Several specific individual level economic variables were identified as predictors of group placement: income variable, occupational level, economic mobility, number of dependents, and economic satisfaction. The total risk and subscale scores of the EDSCQ were also found to be predictive of symptomatology. Some support was also found for the assertion that marriage has a buffering effect upon environmental risk; those economically supported

by a spouse or ex-spouse were found to be at significantly less total environmental risk than those who were single. The results of this study provided additional support for the economic psychology model, the environmental stress hypothesis and the usefulness of the EDSCQ in the assessment of environmental risk.

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## TABLE OF CONTENTS

|                                                                                                | <u>PAGE</u> |
|------------------------------------------------------------------------------------------------|-------------|
| ABSTRACT.....                                                                                  | iii         |
| ACKNOWLEDGEMENTS.....                                                                          | v           |
| LIST OF TABLES.....                                                                            | vii         |
| LIST OF FIGURES.....                                                                           | viii        |
| <br>CHAPTER ONE INTRODUCTION.....                                                              | <br>1       |
| CHAPTER TWO ECONOMIC EVENTS AND MENTAL HEALTH.....                                             | 13          |
| Introduction.....                                                                              | 13          |
| Aggregate Level Studies.....                                                                   | 13          |
| Cross-level Studies.....                                                                       | 29          |
| Individual Level Studies.....                                                                  | 36          |
| Occupational level, Socioeconomic Status, Income...                                            | 36          |
| Employment Status.....                                                                         | 42          |
| Economic Mobility.....                                                                         | 51          |
| Drawbacks of Individual Level Research.....                                                    | 54          |
| Statement of Hypotheses.....                                                                   | 60          |
| <br>CHAPTER THREE PROCEDURE AND STATISTICAL ANALYSIS.....                                      | <br>62      |
| Procedure.....                                                                                 | 62          |
| Instruments Used in the Study.....                                                             | 65          |
| Statistical Analysis.....                                                                      | 72          |
| <br>CHAPTER FOUR RESULTS.....                                                                  | <br>77      |
| Hypothesis I.....                                                                              | 77          |
| Hypothesis II.....                                                                             | 77          |
| Hypothesis III.....                                                                            | 78          |
| Hypothesis IV.....                                                                             | 86          |
| Hypothesis V.....                                                                              | 90          |
| Hypothesis VI.....                                                                             | 91          |
| <br>CHAPTER FIVE DISCUSSION.....                                                               | <br>96      |
| REFERENCES.....                                                                                | 109         |
| <br>APPENDIX I: ECONOMIC, DEMOGRAPHIC AND SOCIAL<br>CHARACTERISTICS QUESTIONNAIRE (EDSCQ)..... | <br><br>131 |
| APPENDIX II: SCL-90-R.....                                                                     | 144         |
| APPENDIX III: BSI.....                                                                         | 146         |

# LIST OF TABLES

| TABLE |                                                                                                       | PAGE |
|-------|-------------------------------------------------------------------------------------------------------|------|
| 1     | Socio-demographic Characteristics of the Samples.....                                                 | 63   |
| 2     | Bivariate Regression of Total Environmental Risk on<br>Symptomatology (Clinical Sample).....          | 79   |
| 3     | Correlations for EDSCQ Scales and Symptomatology<br>(Total Clinical Sample, N = 640).....             | 80   |
| 4     | Regression of EDSCQ Scales on Symptomatology<br>(Total Clinical Sample, N = 640).....                 | 82   |
| 5     | Correlations for EDSCQ Scales and Symptomatology<br>(Clinical, married subsample, N = 354).....       | 84   |
| 6     | Correlations for EDSCQ Scales and Symptomatology<br>(Clinical, single subsample, N = 286).....        | 85   |
| 7     | Regression of EDSCQ Risk Scales on Symptomatology<br>(Clinical, married sample, N = 354).....         | 87   |
| 8     | Regression of EDSCQ Scales on Symptomatology<br>(Clinical, single subsample, N = 286).....            | 88   |
| 9     | Discriminant Function Analysis of Sample Groups<br>by EDSCQ Subscales (N = 791).....                  | 89   |
| 10    | Discriminant Function Analysis of Sample Groups<br>by Economic Variables (Total Sample, N = 667)..... | 92   |
| 11    | Discriminant Function Analysis of Sample Groups<br>by Economic Variables (Married subsample).....     | 94   |

## LIST OF FIGURES

| FIGURE |                                                                                   | PAGE |
|--------|-----------------------------------------------------------------------------------|------|
| 1      | An economic psychology model of antecedents<br>and outcomes in mental health..... | 10   |



CHAPTER ONE  
AN INTRODUCTION TO ENVIRONMENTAL VARIABLES  
AND MENTAL HEALTH

Recent decades have seen a gradual shift in intervention and research focus from the treatment of mental illness, to the reduction and prevention of illness (Cowen, 1983). This shift has been apparent in the evolution of community psychology during the mid-1960s, and a resurgence of interest in ecological and epidemiological studies. Research within these frameworks has been focused upon the identification of those factors in the environment which significantly impact on an individual's mental and physical health.

Dunham's (1937) observation that there appeared to be an inverse relationship between the rental values in various Chicago communities and the rate of schizophrenia (i.e., areas with lower rents had higher rates of schizophrenia among area residents) provided early support for an ecological view of mental illness. Since that time other studies have confirmed Dunham's finding and also identified additional community environmental characteristics associated with an increased incidence of mental disorder. Urban communities (Crowell, George, Blazer, & Landerman, 1986; Turner, 1983), unstable communities (i.e., people frequently move in and out of the area) (Bachrach & Zautra, 1980) and those suffering from economic recession (Brenner, 1973) have been particularly identified as being associated with negative mental health outcomes (i.e., higher rates of admission and utilization of mental health services).

In contrast, the epidemiological approach has been concerned with documenting the occurrence of specific disorders within particular population groups. The underlying assumption of this approach is that, if consistent relationships are found between variables, such as age, sex, and marital status, and mental health outcomes, then populations "at risk" for poor mental health can be identified and intervention strategies initiated.

A complementary research trend is that based on an environmental stress hypothesis (Dohrenwend & Dohrenwend, 1965). This body of research has identified numerous community and individual risk variables apparently related to the incidence of mental disorder. It is the contention of the environmental stress hypothesis, that certain sociodemographic characteristics create stress for an individual and result in some degree of psychological distress.

The vast amount of research generated by these research strategies has resulted in the identification of a number of individual, as well as community environmental variables. At the level of individual, factors such as socio-demographic characteristics, employment status, economic status, and social support networks have been found to influence mental health.

A variety of individual characteristics (e.g., age, sex, marital status, and race) have been associated with an increased incidence of psychological disorder. Repeatedly, it has been observed that females have a higher incidence of some disorders (such as depression), and a higher overall incidence of disorder in general, than males (Cochrane

& Stopes-Roe, 1980; D'Arcy, 1982; Dilling & Weyerer, 1984; Goldstein, 1979; Halldin, 1985; Helgasson, 1978; Jenkins, 1985; Kessler & McRae, 1981; Schwab, Warheit, & Fennell, 1975). Marital status has also been found to have some effect upon mental health: those married (particularly married males) have the lowest incidence of psychiatric disorder, while those who have been separated, divorced, or widowed have the highest rates. The incidence of disorder among singles has been found to fall between these two extremes (Bebbington, Hurry, Sturt, & Way, 1981; D'Arcy, 1982; Dilling & Weyerer, 1984; Ilfeld, 1978; Leaf, Weissman, Myers, Tischler, & Holzer, 1984; Noll & Dubinsky, 1985). With respect to age, the trends are not clear: some studies (e.g. Boscarino, 1979; D'Arcy, 1982; Leaf, Weissman, Myers, Tischler & Holzer, 1984; Noll & Dubinsky, 1985) have identified young adults as having a higher incidence of disorder (disorder in general, depression, and suicide) whereas other studies have identified older individuals as being more at risk for psychiatric hospitalization (Levy & Rowitz, 1973). The finding of any clear, and direct, relationship between any of these variables and psychiatric distress or disorder has no doubt been complicated by the interactions between age, marital status, and gender, such as were noted in the cross-community epidemiological study undertaken by Leighton, Hagnell, Leighton, Harding, Kellert, and Danley (1971). These interactions may account for some of the diverse and contradictory results reported in the epidemiological literature.

Racial minority status has also been associated with an increased incidence of psychiatric disorder (Banks & Jackson, 1982; Levy & Rowitz, 1973; Murphy, 1975). It has been hypothesized by several researchers (e.g., Bland, 1982; Brandon, 1975; Mueller, 1980; Wechsler & Pugh, 1967-68) that those individuals with a particular characteristic, living in an area where that characteristic is not common, may be at greater risk for hospitalization (and perhaps disorder, in general) due to a lack of "fit" between the person and the community. This hypothesis may have broader implications for individual risk variables, in general, and may, in part, explain the contradictory results reported from different community samples (i.e., the relative minority status of an individual may well differ between communities).

Studies of the utilization of mental health services have isolated particular characteristics of residential areas as being associated with increased service utilization. In general, areas of elevated utilization have been urban (Crowell, George, Blazer, & Landerman, 1986; Turner, 1983), primarily poor and unstable (Bachrach & Zautra, 1980; Houpt, Orleans, George, & Brodie, 1979), and relatively undesirable (McCarthy, Byrne, Harrison, & Keithley, 1985).

These associations between negative community characteristics and utilization led to several hypotheses concerning the nature of the ecological relationship. Brandon (1975), and Noll & Dubinsky (1985) have suggested that it is the relative lack of social integration found in these areas which causes higher rates of disorder, which in

turn are reflected in elevated rates of service utilization (provocation hypothesis). In contrast, Dooley, Catalano, and Brownell (1986) proposed a less direct pathway between area conditions and utilization. They hypothesized that area characteristics (e.g., economic conditions) influence only the decision, by those with pre-existing disorder, to seek treatment (uncovering hypothesis), rather than influencing the actual incidence of new disorder. The elevated rate of incidence in an area therefore would not reflect the incidence of new disorder ("true incidence"), but rather a change in the number of people with pre-existing disorder being treated. Whether the pathway linking community characteristics, disorder, and service utilization is viewed as direct or indirect (research has not yet clarified the mechanism), there does seem to be a consensus that community variables have an important influence upon the occurrence of disorder.

One of the most commonly reported associations in the literature is that between social class and mental disorder. Hollingshead and Redlich (1953) observed that the incidence of disorder was negatively correlated with social class: the higher the level of social class membership, the lower the overall rate of disorder. While many other researchers, subsequent to that time, have confirmed Hollingshead and Redlich's general observation (e.g., Bebbington, Hurry, Tennant, Sturt, & Way, 1981; Crisp, McGuiness, & Harris, 1978; Dilling & Weyerer, 1984; Halldin, 1985; Kessler & Cleary, 1980), a debate has ensued as to the direction of causation. The question remains: does class

membership cause mental disorder, or do the consequences of mental disorder result in a concentration of disordered persons in the lower classes?

From this debate, two hypotheses have been proposed. The first of these is the social causation hypothesis: it contends that the greater stresses associated with membership in the lower classes (e.g., higher incidence of stressful life events, lower income, inadequate housing, etc.) account for the higher incidence of disorder in the lower classes (Gibb, 1980; Liem & Liem, 1978; Salokangas, 1978). In contrast, the social drift hypothesis proposes that it is the effect of mental illness upon economic variables (e.g., income and employment status), which results in those with mental disorders gradually declining in social status (Gibb, 1980; Liem & Liem, 1978; Salokangas, 1978). To date, research has not eliminated either hypothesis, and, quite probably, both mechanisms may be involved (Allen & Britt, 1983).

The life events literature has broadly tied the occurrence of life events, and negative life events in particular (such as death of a family member, loss of a job, relocation, divorce, etc.) to the subsequent onset of psychological disorder. In general, research studies have shown an association between the occurrence of undesirable life events and the onset of disorder, in general (Cooke & Hole, 1983; Brown, 1972; Mueller, Edwards, & Yarvis, 1978; Tennant, Bebbington, & Hurry, 1981), and depression, in particular (Crowell, George, Blazer, & Landerman, 1986; Brown & Harris, 1982b; Brown, Bhrolchain, & Harris, 1975; Hallstrom & Persson, 1984; Costello, 1982;

Fava, Munari, Pavon, & Kellver, 1981; Finlay-Jones & Brown, 1981; Goering, Wasylenki, Lancee, & Freeman, 1983). These findings linking the occurrence of events (economic or social) have been interpreted as providing some supportive evidence for a provocation hypothesis of mental disorder, whereby negative events directly lead to disorder (i.e., events provoke disorder). Events which appear to be of particular importance in the onset of depression have been characterized as severe, threatening, uncontrolled, and personally experienced negative events (Brown, 1974; Brown & Harris, 1982; Tennant, Beggington, & Hurry, 1981; Fava et al., 1981).

Several questions have arisen from the life events literature. Debate exists as to both the time period for inclusion of events and the strength of effects of relatively distant events. While some researchers, such as Brown (1974) and Goering, Wasylenki, Lancee, and Freeman (1983) have contended that only those events occurring in the three weeks prior to the onset of a disorder are of aetiological significance, others have argued for the cumulative importance of events over as long as twelve months (Brown, Bhrolcain, & Harris, 1975; Billings, Cronkite, & Moos, 1983). At least two difficulties are associated with the inclusion of such temporally remote events: accuracy of reporting (selective memory, event sequence, etc.) and the question of any enduring effect of an event after one year.

One of the more important potential moderator variables, as identified by life events research, is social support. Social support has been hypothesized to have either a direct or a "buffer" action.

As a buffer, social support has been viewed as influencing mental health outcomes only in the presence of stressful life events (Syrotuik & D'Arcy, 1984). The alternately hypothesized, direct action of social support, suggests that social support directly affects mental health independently of the occurrence of stressful events: when there is a deficiency of social support, levels of symptomatology increase (Syrotuik & D'Arcy, 1984; Henderson, Duncan-Jones, McAuley, & Ritchie, 1978). The results of a recent study by Schindelka (1986) suggest that social support may function by both of the hypothesized mechanisms; for single individuals, social support was found to play a stress buffering role, while for married individuals, it had a direct effect upon symptomatology. However, it could be hypothesized that marriage itself is a major social support factor, which already buffered the married individuals.

An abundance of research has been published over the past fifteen years relating economic stress to the incidence of mental disorder. The effects of both negative fluctuations in the general economy (e.g., Brenner, 1973; 1975; Catalano & Dooley, 1977; Dooley, Catalano, Jackson, & Brownell, 1981; Frank, 1981; Marshall & Dowdall, 1982) and regional economic booms (Sclar, 1980; Copithorne, 1983) have been found to influence the mental health of the community. Individually experienced negative economic events, such as loss of employment (e.g., Baum, Fleming, & Reddy, 1986; Cohn, 1978; Jackson & Warr, 1984) have also been identified as stressors which can influence the onset of psychological distress (ranging from dissatisfaction to specific

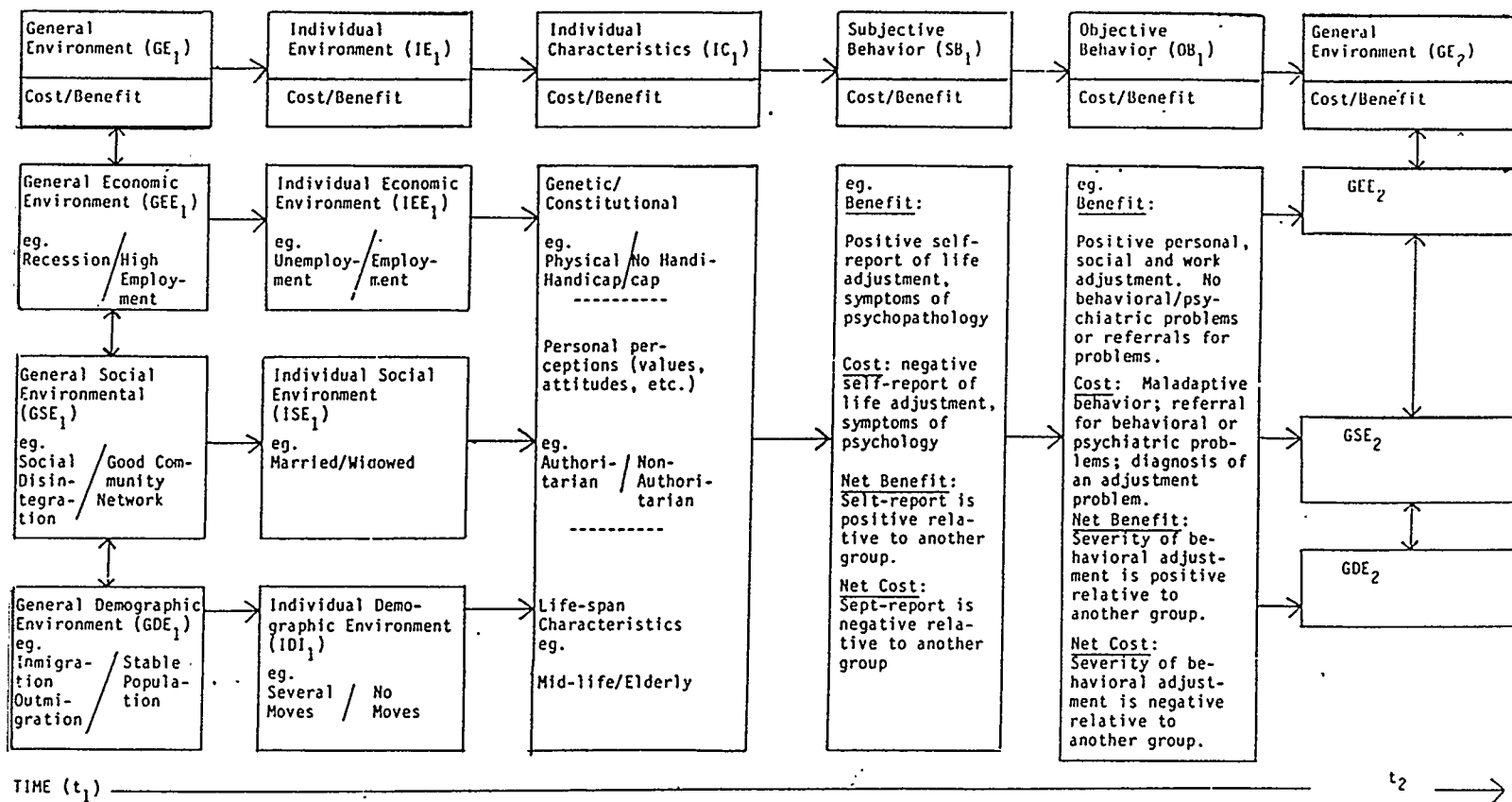


disorders). The large body of evidence concerning the effects of both aggregate and individual economic change led Catalano and Dooley (1981) to conclude that there was a negative effect on individuals associated with negative economic change. This effect they termed "behavioral cost" (Catalano & Dooley, 1981). Behavioral cost refers to both the physical and psychological consequences which have been found to be associated with negative economic change in particular, and negative environmental changes in general.

The large number of potential individual and community environmental variables, and their possible interactions, identified by the research literature, led MacFadyen and MacFadyen (1986) to develop a model of environmental effects within a conceptual framework of economic psychology (See Figure 1, pg. 10). Their model is based on the hypothesis that certain socio-demographic factors place an individual at particular risk for some form of behavioral cost (psychological or physical disorder) in the face of environmental stressors (MacFadyen & MacFadyen, 1984; 1985; MacFadyen, 1984; 1986). Development of a disorder is also hypothesized to be dependent upon the subjective evaluation of events and personality attributes. It is the relative balance of risk and benefit accruing from a particular situation which determines any subsequent development of a behavioral cost.

This model outlines several levels of analysis of environmental effects, allowing for the simultaneous consideration of a variety of individual and community variables which may occasion a behavioral cost.

Figure 1. An economic psychology model of antecedents and outcomes in mental health.



These levels include the General Environment, Individual Environment, and Individual Characteristics.

At the most general level of analysis is the general environment effect. This level incorporates those effects demonstrated by studies relating the effects of the community environment (e.g., recession) to community level distress indicators (e.g., psychiatric in-patient admission rates). Research studies such as those undertaken by Brenner (1973) and Barling and Handal (1980) which linked the rate of unemployment in a geographic area to psychiatric admissions and service utilization exemplify the effects considered at this level of analysis.

The second level of analysis is focused at the level of the immediate environment of the individual. At this level, social, economic, and demographic characteristics of individuals are related to individual level behavioral costs. The findings of Finlay-Jones and Eckhardt (1981) that the loss of a job was significantly related to the onset of depression would be categorized as an individual environment level effect.

The third level of analysis encompasses those characteristics within the individual which may play a role in the subjective evaluation of events (including genetic or constitutional factors and personal perceptions). Hartley's (1980) hypothesis concerning the perception of unemployment, would be encompassed within this third level. He contended that some workers might view unemployment in a positive light as a career opportunity (e.g., white collar workers),

while other (e.g., blue collar workers) view unemployment in a more negative light.

Based upon their economic psychology model, MacFadyen and MacFadyen (1984; 1986) developed the Economic, Demographic, and Social Characteristics Questionnaire for the identification of the individual environment variables. This questionnaire collects information concerning a broad array of individual variables (e.g., sociodemographic, economic, social support) which have been empirically linked to behavioral costs.

The focus of the present study is two-fold. First, this study will attempt, at the individual level of analysis of the economic psychology model, to support the hypothesis of a direct relationship between environmental risk in general and economic risk, in particular (as measured by the EDSCQ), and behavioral cost in terms of subjective reported symptomatology. Second, the study will examine the general usefulness and validity of assessing environmental and economic risk at the individual level using the EDSCQ.

## CHAPTER TWO

## ECONOMIC EVENTS AND MENTAL HEALTH

Introduction

The effect of economic variables on the mental health and general well-being of individuals has recently become an area of renewed interest. M. Harvey Brenner's book, Mental Health and the Economy (1973), played a large role in initiating research and debate with respect to the negative effects of economic downturns on the health of individuals. Subsequent to Brenner's book, a multitude of studies have examined the relationship between the general economy and community level distress (aggregate level research) and personal economic conditions and mental health (individual level research). While the results to date are somewhat mixed, it would appear that there is support for the contention that economic events (especially negative economic events at the community and individual level) have implications for the psychological well-being of individuals.

Aggregate Level Studies

Aggregate level research studies investigate the relationship between the status of an area's economy, as indicated by such measures as the inflation rate or unemployment rate, and the mental health of the population in that area, as measured by community level indicators (e.g. admissions and utilization rates for mental health facilities). These studies are intended to address the question of whether rises and falls in the economy of a region (the aggregate economic changes) are associated with changes in demand for mental health services

(aggregate indicators of pathology). Some researchers (such as Catalano, Dooley, and their associates) have extended the scope of aggregate research by including not only these aggregate level measures, but also, individual level measures of economic stress (e.g. income level, employment events) and mental health (e.g. suicidal behaviors, psychiatric morbidity); these studies are categorized as cross level designs.

The principal advantage of aggregate level studies is that macroeconomic change is more clearly independent of subsequent disorder than are individual level life events (Dooley & Catalano, 1980). This avoids the potential confound, commonly encountered in individual level studies, of not being able to determine the order of causality: was the onset of disorder subsequent to an economic event (e.g. job loss), or did pre-existing disorder cause the economic event? Economic shifts at the aggregate level are less vulnerable to this reverse causation confound. The use of archival economic indices also precludes the problem of the subjective interpretation and recollection of events (inherent in the life events scales which are commonly used as the indicators of economic events at the individual level of analysis).

While there are some advantages in the aggregate design, the drawbacks, also associated with this approach, limit the contribution of this body of research to the understanding of the implications of economic stress on the mental health of the individual. Two of the more important criticisms of the aggregate design include the danger

of committing the ecological fallacy (Catalano & Dooley, 1977, 1981; Spruit, 1982; Wagstaff, 1985) and the inability of aggregate research to identify causal mechanisms linking economic conditions and the incidence of distress (Catalano & Dooley, 1977, 1981; Dooley & Catalano, 1986; Platt & Kreitman, 1985).

The concerns pertaining to the ecological fallacy are derived from the potential of drawing inaccurate individual level conclusions from community data. Aggregate studies can not preclude the possibility that those seeking treatment are not those directly experiencing economic hardship. For example, an aggregate level observation of an increase in the suicide rate following an increase in the unemployment rate, can not be directly translated into a statement that the increased suicide rate is due to suicides from among the ranks of the unemployed.

A second, and perhaps more important, criticism (in terms of the progress of research in the area) concerns the inability of aggregate level research to identify the causal mechanisms linking economic conditions and the incidence of distress. After reviewing many aggregate level studies, Catalano and Dooley (1977, 1981) concluded that in spite of finding some significant relationships between macroeconomic indicators and admissions, to date, aggregate research had shed little light upon any intervening variables. In fact, the only outcome measure consistently found (by aggregate research) to be associated with economic change, according to Dooley and Catalano (1986) and Platt and Kreitman (1985), is suicide, and it is possible

that even this association is spurious (Platt & Kreitman, 1985). The absence of a model of intervening mechanisms not only hampers the methodical progression of research in the area, but also limits the conclusions and implications that can be drawn.

During the past two decades, researchers have documented the relationship between economic fluctuations and subsequent changes in levels of aggregate indicators of mental illness (such as suicide rates and mental hospital admissions). Initially, it was proposed by Brenner (1973, 1979) that economic contraction caused or provoked new cases of mental and physical disorder. Subsequently, others (among them Dooley and Catalano, 1980, 1986) have cautioned against a simple, unidirectional relationship between economic stress and disorder, identifying the need for a complex, multilevel model able to account for the diverse findings at the individual as well as aggregate level.

Researchers have hypothesized that aggregate economic events may have direct as well as indirect effects upon admissions to mental health facilities. Brenner (1973) and Catalano and Dooley (1979) suggested that during economic hardship there may be decreased tolerance, among both family members and society (employers, in particular) at large, for marginal behavior. The effect of this hypothesized attitude change could be to increase the measured incidence of psychiatric disorder, independent of any direct change in severity in the individual. During periods of recession, there may also be a shift to a greater reliance upon formal sources of support (mental health professionals) (Catalano & Dooley, 1979), rather than



informal sources (such as family and friends). The availability of treatment resources may also be influenced by the general economic climate (budgetary restraint during recessions can lead to staff cutbacks and bed closures). These behavior and policy changes, influenced by the economic condition of the community, could account for some of the increased level of distress (as measured by admissions to mental health facilities) observed during periods of recession (Dooley, Catalano, & Brownell, 1986).

M. Harvey Brenner's (1973) study of New York state data marked a rekindling of interest in the effects of the economy on mental health. This exhaustive analysis of economic and admission data for New York state, found an inverse relationship between economic change (as measured by the annual manufacturing employment rate) and total first admissions to mental hospitals for the period of 1914 to 1967. During poor economic times there was an increase in the number of admissions, whereas during good economic times there was a decrease in admissions.

Disaggregation of the admissions data by sex, education, and diagnostic category revealed that the relationship between the economy and admissions was more complex than was initially apparent. While the inverse relationship between employment and hospitalization held for the total group, for some subgroups (those with less than grammar school education, women with high school education, those with a diagnosis of senility, the young and the old) a positive association was found. For these groups, good economic times were associated with increased levels of admissions. A differential racial effect was also

noted: Armenians and Jews showed the highest negative correlations between the economy and admissions, whereas Negroes and Spanish Americans appeared to be least affected. The data concerning men suggested that those in relatively high status (merchants, doctors, and lawyers), high earning occupations did not show as strong inverse relations as did those in lower socio-economic status occupations (laborers, salesmen and farmers). These findings led Brenner to hypothesize that those particularly vulnerable to economic downturns were those who were a part of the work force but who had relatively few economic resources (i.e. those in lower occupational/educational groups). In contrast, those in the very lowest income groups (those on welfare or essentially outside the economy), according to Brenner's hypothesis, would suffer little during economic declines, and in fact, might even enjoy a relative gain. While this relative vulnerability hypothesis might account for some of the counterintuitive findings of the study, it does not explain the positive associations found for women and for particular age groups. For these groups, if the positive association is valid, some other causal mechanism must be involved.

Brenner concluded that the data from this study provided evidence that the relationship between economic change and mental hospitalization could be explained by the interaction of at least three factors: financial resources, society and family tolerance of psychiatric symptoms, and the presence of symptoms themselves. Each of these factors was hypothesized to play some role in a multicausal

sequence whereby an economic downturn served generally to increase admissions, whereas an upturn decreased them.

Brenner's work has provoked lively discussion and debate. Reviews and critiques (Catalano & Dooley, 1977; Cohen & Felsan, 1979; Dooley & Catalano, 1980; Marshall & Dowdall, 1982; Marshall & Funch, 1979; Ratcliff, 1980; Wagstaff, 1985) have not only highlighted the limitations of the New York study in particular, and aggregate research in general, but have also noted the wealth of research undertaken as a result of the ensuing theoretical and methodological debates. Marshall and Dowdall (1982), while noting the many limitations and drawbacks of the study, also commended Brenner's work for the new dimensions it had added to psychiatric epidemiology. Brenner had emphasized: i) the relevance to psychological distress of political economy; and ii) the connections between the economy and society.

Many of the criticisms directed at Brenner's studies are those shared by aggregate studies in general. The first concern centers upon the use of first admission data from mental hospitals. Marshall and Funch (1979), Catalano and Dooley (1977, 1981), Ratcliff (1980), Wagstaff (1985), and Kessler, House and Turner (1987) have all questioned this measure as the sole criterion of distress given the known confounds of hospital capacity, patterns of utilization and admission, and the limited psychiatric facilities sampled. Admissions to psychiatric in-patient facilities would account only for those experiencing an extreme level of distress, omitting those accessing

less formal resources (out-patient facilities, non-professional counsellors, etc.) (Dooley & Catalano, 1986; Dear, Clark & Clark, 1979). The use of in-patient psychiatric hospital admissions, as the sample population, may also over-represent the lower socio-economic groups due to the greater tendency of middle and upper class groups to seek treatment through other facilities (i.e. private treatment).

Other concerns have focused on the measurement of the economic variables. Aldwin and Revenson (1986) suggested that economic measures other than the rate of unemployment, such as the number of long term unemployed, may be better indicators of the costs of economic downturns. Many researchers have also argued for the use of multiple measures of aggregate economic conditions (e.g., Catalano & Dooley, 1977, 1981; Platt & Kreitman, 1985; Wagstaff, 1985) which can reflect a variety of economic changes that a community can potentially experience. Catalano and Dooley (1977, 1981) further suggested that the use of economically related regions (i.e. the Standard Metropolitan Statistical Area) rather than politically defined areas (i.e. cities or counties) would be more consistent with the measurement of macroeconomic variables.

The lagging of the dependent psychiatric distress measure (and the very use of time series regression methodology) in the absence of a theory based model has been debated (Catalano & Dooley, 1977, 1981; Wagstaff, 1985). The determination of lag periods post hoc to maximize the association between the economic measures and subsequent admissions appears to be methodologically questionable. A better

approach, instead, would have been to test the data within the context of a theoretical model with the lags predetermined, based on a theory, or framed in a specific hypothesis. The immediacy of impact of economic events remains in question: lags of one year may fail to capture any crisis reaction, yet shorter lags may lose any cumulative effects, and lags of several years bring into question any relationship between the index economic event and the measured effect. Proposed models need to address the theoretical implications of the various lag periods already found.

A final criticism, to be noted here, pertains to the problem of the ecological fallacy. Wagstaff (1985) and Cohen and Felsan (1979) criticized Brenner's use of data from the aggregate level while his explanations of the results were based on individual level behaviors (i.e. individuals change their support networks and families become less tolerant of aberrant behavior during periods of recession). In the absence of any model accounting for any effect of the economy at large on individual behavior, such explanations must be extremely tentative. While Brenner's research identified one potential starting point (economic decline) and one end point (distress), the intervening mechanisms remain a "black box" (Dooley and Catalano, 1986).

In spite of these limitations, this study was of importance to the research area. It did focus attention upon the potential implications of economic changes upon psychiatric service requirements. In addition, and perhaps of greater importance to community psychology, Brenner hypothesized the interaction of many

variables both on the individual (race, gender, age, etc.) and societal level (tolerance, economic activity, etc.). Subsequent studies have attempted to address the limitations of Brenner's study through the use of more complex designs and analyses, but for the most part, Brenner's original contention that the economy has an effect upon psychiatric distress has been supported.

Subsequent to Brenner's (1973) work, other aggregate level research has examined the effect of the economy on both physical and mental health. The most frequently utilized economic indicator has been the regional rate of unemployment, although other indicators such as the inflation rate, the Consumer Price Index, and common stock price fluctuations have also been employed. Health implications have been measured by the incidence of disease, disease specific mortality rates, admissions to mental health facilities, utilization of mental health services, and suicide rates.

Some studies have found an association between physical health measures and the economy. Eyer and Sterling (1972) found that for males, the ulcer death rate fluctuated with the business cycle. In particular, among working men, for each peak in unemployment, there was an associated peak in the ulcer rate; those aged 15-30 years were identified as being under particular stress. Bunn (1979) and Brenner and Mooney (1982) found that the rate of unemployment was also associated with cardiovascular mortality (at lags of 0-5 years), with the strongest association in the 55-64 year age group. All of these

studies suggested that the pattern of mortality was consistent with an increased level of stress.

Contrary to this lagged, positive association between unemployment and mortality, Eyer (1977) noted that the general death rate rises during business booms, and falls during depressions. While Brenner (1979) had hypothesized that this effect was due to the delayed and cumulative effects of a previous period of economic decline, Eyer proposed that the current stresses (increased migration, over-work, and community breakdown) that occur with a boom account for the association.

Reviewing these studies, it would seem that, depending upon the lag period adopted, one could use the same data to support an association between either upward or downward economic shifts and mortality. While the economy may have an effect on physical health, aggregate correlational studies such as these cannot untangle the causal relationships. Cahill (1983) and Colledge (1982) in reviewing studies of macroeconomic indicators and morbidity/mortality also concluded that while there may be an association between the business cycle (especially the rate of unemployment) and the changing patterns of mortality, no causality could be clearly demonstrated at this point.

Analyses of admissions to mental health facilities do not provide any clearer picture of the effects of the economy on mental health. Studies such as those by Dear, Clark and Clark (1979) and Marshall and Dowdall (1982) which examined long term trends in the economy (1875 to

1977, and 1914 to 1955, respectively), produced conflicting conclusions. No association between the economy and admissions in Ontario was found by Dear, Clark and Clark (1979); admission rates consistently rose prior to 1960, and then subsequently declined. This trend, they concluded, was due not to any economic variable, but rather, to political and treatment changes, which resulted in a significant decline in the number of in-patient beds and confounded any economic cycle effect. While Marshall and Dowdall did agree with Brenner's contention that the economy has an effect on mental health, they found the effect to be in the opposite direction. For Buffalo (using a subsample of the New York population statistics utilized by Brenner), they found a positive correlation between economic conditions and the rate of first admissions (i.e. more admissions during good economic times than during recessions). Marshall and Dowdall's results would seem to provide some confirmation for Eyer's contention that good economic times may also be stressful.

Examinations of shorter term trends in the economy (analysis of one to six year periods) and admissions have also produced significantly different results depending upon the aggregate measure of distress (inpatient and/or outpatient first admissions; admissions or readmissions) used and the geographic area targeted (rural or urban).

Some consensus appears to exist concerning the association of economic conditions and level of in-patient admissions. Analyzing state level data, Frank (1981) found that both upturns and downturns



in the economy predicted first admissions at two and three month lags, while Draughton (1975) found only economic decline to be associated with job related mental hospital admissions. Economic decline (as measured by the increased rate of unemployment) was also found to predict in-patient admissions at a lag of six months to nine months (for first admissions) but only for some population subgroups (low status occupational groups and those who had not completed high school) in the St. Louis area (Barling & Handal, 1980).

Ahr, Gorodezky and Cho (1981) and Banzinger, Smith and Foos (1982) found that, while the unemployment rate did not predict admissions, it did predict other utilization measures. Ahr et al. found an association between the unemployment rate and the level of re-admissions for both in- and out-patients, while Banzinger et al. found that it predicted calls to a rural Appalachian distress line. Barling and Handal's (1980) study of the St. Louis area (previously mentioned) suggested that during an economic decline (i.e. an increase in unemployment), utilization of outpatient services by those most poorly educated actually decreased, while the inpatient admissions by other groups increased. The diversity of economic indicators, lag periods, geographic areas (urban, rural or combined), and distress measures utilized in these aggregate level studies preclude any generalizations being drawn. An association between the economy and distress (as measured by admissions or service utilization) would seem logical, but the relationship is no doubt more complex than that

implied by testing of a hypothesis linking an elevated unemployment rate (or recession) and mental distress.

The observations of Barling and Handal concerning the utilization of mental health facilities did provide some confirmation for the aggregate level association between the economy and distress (admissions), and for Brenner's contention of differential vulnerability. Those population subsamples, which were described as less educated and having lower status occupations, were found to be those for whom the shifts in the economy were associated with increased levels of admissions. They also found that there was a disproportionately high percentage of people unemployed at the time of admission (27.6% of those admitted were unemployed) as compared to an unemployment rate of 6.05% for the population of the city in general. Barling and Handal identified these groups (the less educated, unemployed, and lower status occupations) as being particularly vulnerable to economic change. They suggested that public facilities should expect (and perhaps even temporarily re-allocate funds for) an increase in in-patient admissions and a decrease in out-patient admissions by these risk groups after the six month period following an economic decline (Barling & Handal, 1980).

There has been considerable interest in the relationship between fluctuations in the economy (unemployment rate changes, in particular) and suicide rates. Platt (1986, 1984), Platt and Duffy (1986), and Platt and Kreitman (1985), in reviewing the voluminous literature on unemployment and suicidal behavior, found that experimental design

(longitudinal or cross-sectional, aggregate or individual level) had an important effect on the findings concerning this relationship. They concluded that with respect to the aggregate level, cross-sectional studies have shown a consistent geographic association between unemployment and parasuicide (deliberate self harm) but no relationship between unemployment and completed suicide. Contrary to these findings, aggregate level, longitudinal studies have found a significant positive association between unemployment and completed suicide. Despite the evidence for an association between suicidal behavior (completed suicides and parasuicides) and unemployment, Platt (1984) reflected that the nature of the association remains problematical; macroeconomic conditions may constitute an important antecedent variable but not necessarily a direct causation of suicide and parasuicide.

Other studies of suicide also reflect Platt's contention concerning the linkage of macroeconomic conditions and suicidal behavior. Aggregate studies (such as Boer, 1980; Marshall & Hodge, 1981) have linked rising unemployment to an increase in the rate of suicide, while others (e.g. Lester (1970), and Pierce (1967)) have found no consistent relationship. Lester and Pierce concluded that any economic change, either positive or negative, affected suicide rates.

The cross-level study by Platt and Kreitman (1985) examined both the aggregate and individual level effects of unemployment on suicidal behaviors. Their most important findings were: (a) The Edinburgh

wards with the highest parasuicide rates (for both employed and unemployed) were also those wards with the highest rates of unemployment, higher levels of poverty, health problems and other social problems; (b) Poverty rather than unemployment rate predicted parasuicide rates; (c) The rate of parasuicide among the unemployed decreased over the years examined, but the absolute numbers of parasuicides increased (due to the increased numbers of unemployed persons); (d) The highest rate of suicide occurred among the chronically unemployed; (e) The rate of parasuicide among those employed increased as the rate of unemployment increased, but their relative risk as compared to those unemployed actually decreased. These findings seem to imply an overall effect of the unemployment rate on the overall rate of suicide/parasuicide, but the pathways and degree of the aggregate level effects may be quite different for those employed versus those unemployed. The complexities of the relationships between the aggregate level variables and the individual level effects remain to be untangled.

Although somewhat inconsistent, the results from aggregate studies would seem to support Brenner's general contention that, at some level, there is a linkage between community level economic events and population distress. At this point it would appear, at least, that downturns in the economy are associated with subsequent in-patient admissions, suicide rates, and possibly with other economic indices. While these studies can not directly address the question of impact at the level of the individual, a general trend in the results

would appear to be that macroeconomic events have an effect on the individual, but the mechanisms (direct and indirect effects) are as yet not clear.

### Cross-level Studies

In a series of cross-level studies, Catalano and Dooley (1977, 1979, 1983; Catalano, Dooley, & Jackson, 1981; Dooley and Catalano, 1984) examined the relationships among aggregate and individual economic indicators, and aggregate and individual level measures of distress, in order to examine the causal pathways between economic stress and mental disorder. Economic indicators at the aggregate level included a variety of measures of economic activity (i.e. rates of employment and unemployment, inflation, changes in the structure of the work force, etc.) while at the individual level, stressful life events inventories and interviews were employed. Levels of distress were determined at the aggregate level by psychiatric hospital admissions and population surveys and at the individual level by questionnaires and interview data.

Unlike aggregate and individual level research, which are confined to a single level, the cross-level approach, employed by Catalano and Dooley, attempts to measure the effect of aggregate economic experiences on individual disorder via individually experienced events. This cross-level design, according to these researchers, has the unique ability to determine the effect of any interaction of economic climate and life events on individual distress

(Dooley & Catalano, 1986). Cross-level analysis would appear to have some potential in untangling the multiple levels and interactions between economic variables, at both the individual and aggregate levels, but to date this has not been achieved.

Before examining the multitude of research studies embarked upon by Ralph Catalano, David Dooley, and their associates, certain limitations should be noted. While most of the studies did utilize large sample sizes, the samples were generally limited to middle-class, white and relatively well educated subjects. As much of the information about these subjects came from telephone or mail surveys, the inherent problems associated with these survey methods of data collection exist (sample selection, social desirability of responses, etc.). In addition, subjects reported on past life events, thus the difficulty of selective memory (especially when reporting events from the preceding year) arises. The potential confounding of events and symptoms may also exist as no base line data for the subjects was collected prior to the outset of the studies. Some of the conflicting results found by these studies may in part be due to these problems confounding the measured effects.

In their study of the Kansas City area, Catalano and Dooley (1977) attempted to improve upon the design utilized by Brenner. The study area was the Kansas City Standard Metropolitan Statistical Area (SMSA); this included all surrounding counties which were participants in the economy centered in Kansas City. Thus, rather than delimiting the study area by political boundary, an economic area was used.

Further improvements in the economic measurements were accomplished by examining monthly data rather than annual measurements, by utilizing multiple economic indicators, and by including both aggregate and individual level economic events. The aggregate economic indicators included: (a) city, state, and national unemployment rates; (b) inflation; (c) employment rate; (d) absolute and algebraic changes in size and structure of the work force; and (e) intrasectoral employment change. Individual level economic and life events were measured by the Life Events Schedule (constructed by Dohrenwend and Dohrenwend) and this data was then aggregated into monthly data for analysis. The level of psychological distress in the community was measured by weekly random sample surveys of the normal population utilizing the CESD-Depression scale, rather than by in-patient admissions. Among the more important initial conclusions drawn from this study was the observation that, in the normal population, the lag between economic change and noticeable change in life events and mood was a period of a few months, rather than the twelve to twenty-four month lag found by Brenner. Both economic growth and downturn were found to be stressful and to result in disorder.

Subsequent re-analysis of the Kansas City data (Catalano & Dooley, 1979; Dooley & Catalano, 1979) confirmed some of the initial findings linking the economy and population distress levels, but disaggregation of the data also revealed further complexities. While the original contention of a linkage of economic environmental change to community life events was supported overall, some interesting

gender, age, and income differences were found. For men, positive correlations were found between local and regional unemployment rates and life events, but no relationship was found between aggregate unemployment variables and psychiatric symptomatology (Midtown scale). In contrast, for women, noneconomic events and distress were related to absolute economic change, but not to unemployment. Contrary to Brenner's findings, no age effect was found either for unemployment or absolute economic change: the middle-aged group was not especially sensitive to unemployment. In addition, the low-income group appeared more responsive to economic change than did the middle-income group. While these findings were suggestive of an association between a community's economy and later changes in individual level economic and noneconomic events, Catalano and Dooley cautioned the data was not proof that aggregate economic shifts actually influence the incidence of illness or abnormal behavior. Economic change, they suggested, might influence measured distress through changes in community tolerance of those with mental disorder, rather than actually provoking new disorder.

The results from the Kansas City study were not replicated in the subsequent rural sample from Washington County, Maryland. None of the synchronous or lagged correlations involving depressed mood and unemployment, or life events and absolute change in the work force reached significance in that normal population sample (Dooley, Catalano, Jackson, & Brownell, 1981). They concluded that, for that particular rural sample, interpersonal satisfaction might have been of



more importance to residents than economic conditions, thus raising other potential individual level variables (locale and satisfaction) in the pathway between economic events and psychological distress.

In a further Washington County study utilizing patient admissions (a more extreme measure of disorder) in addition to the symptomatology measure, Catalano, Dooley, and Jackson (1981) did find a correlation between economic change and admissions. For males, admissions were related to the lagged unemployment rate, while for females, admissions were inversely related to the lagged, weighted economic change measure. This gender difference in the economic variables related to disorder echoed the findings in the 1979 Kansas City study, but only when the more extreme distress measure of inpatient admissions was utilized. The rural/urban differences, as well as the subgroup results suggested by the Kansas City and Washington County studies, again point to the complexity of the inter-relationships between community economic events, individual characteristics, and any mental health implications.

Later studies of the Los Angeles County area, by Catalano, Dooley and associates, further attempted to clarify the economic change/disorder association. While Catalano and Dooley (1983; Dooley & Catalano, 1984) found that the probability of physical or psychiatric morbidity was related to individual level undesirable job and financial events, community level economic contraction only had a main, positive effect on the likelihood of experiencing an undesirable job or financial event for those respondents of the middle

socio-economic status. Dooley and Catalano, specifically looking at the effect of the unemployment rate on life events, found interactions of unemployment rate with gender and status. Women reported more events in middle unemployment quarters, while males reported more events in low and high unemployment quarters. With respect to socio-economic status, it was found that for the middle socio-economic status respondents, life events rose linearly with unemployment (i.e., a positive association between events and unemployment rate), while for those in low and high socio-economic status groups, life events fell (i.e., an inverse association between events and unemployment rate). Dooley and Catalano suggested that economic contraction may lead to increased help seeking both by increasing the incidence of symptoms and by increasing the prophylactic (asymptomatic) use of mental health facilities.

The hypothesized prophylactic utilization of facilities during times of perceived job insecurity (independent of symptoms) was confirmed in a subsequent study (Catalano, Rook, & Dooley, 1986). The variables of being white, higher SES, female, older, and having social support were found to be associated with increased chances of help-seeking. Aldwin and Revenson (1986), in a follow-up of the Los Angeles County area study population (investigated by Catalano and Dooley, 1983), found that individually experienced, negative economic events (e.g., decrease in income, loss of employment), increased the number of symptoms reported (over the follow-up period) independent of prior symptom level. They also noted that short term economic stress

(as measured by individual level economic events) did not appear to have lasting negative effects, and that only those people who had experienced recent or persistent economic stress showed decreases in psychological functioning. While these Los Angeles County studies did not clarify the existence of any simple, direct effects of aggregate economic indicators (i.e. unemployment) on individual level distress, they did provide further evidence for a complex model of inter-relationships between aggregate and individual economic variables and a variety of other individual level variables (demographic, social, and individual).

In summary, the cross-level studies by Catalano, Dooley, and associates have found a variety of associations between economic events at the aggregate and individual levels and various measures of disorder. In general, these studies would appear to indicate several important dimensions for consideration in aggregate level effects: urban versus rural, male versus female, and socio-economic status. At the urban level, their studies did suggest an overall aggregate economic effect, but its influence was subject to the influence of gender and socio-economic variables. The contrasting results from the rural studies are further suggestive of the need to account for multiple interactions and moderating variables. At this point, it would appear that the relationship between aggregate level economic events and the individual experience of distress is extremely complex, involving interactions between many individual level variables

(demographic, economic, and social) and community variables (unemployment level, location, economic conditions).

#### Individual Level Studies

The individual level of analysis has been used by researchers to measure the relationship between prior economic life events, such as occupation change or job loss, and the occurrence of some degree of psychological distress, varying from dissatisfaction to completed suicide. Researchers have investigated both the current relative economic situation of individuals (i.e. social class, income level, occupation), as well as the occurrence of changes in economic situation, in attempting to identify those immediate aspects of economic life which may place a person at increased risk for psychological distress. These studies address the question of whether personal economic circumstances are associated with subsequent increases in symptoms.

#### Occupational level, Socioeconomic Status, Income.

The term occupational level refers to the relative degree of skill and education required by a particular group of related jobs. Occupations can be placed on a gradient of relative skill level from those occupations which are of an unskilled nature, on one extreme, to those which entail a high degree of skill on the other extreme. Any classification is, of course, arbitrary and open to criticism, but there is general agreement in the research literature in grouping occupations, at least, as unskilled, semiskilled or skilled.

Surveys of normal, adult populations have suggested a negative effect of occupational level on psychological and physical complaints (an inverse relationship between occupational level and distress). Eide, Thyholdt, and Hamre (1982), in a survey of a normal adult population, found that professionals had the lowest level of physical and psychological complaints while unskilled workers had the highest. This result was consistent with Salokangas and Mattila's (1977) findings that, for a group of adult employees, occupation correlated negatively with a group of illness variables. In particular, they found that low occupational status was related to both chronic illness, health center visits, and sick leave.

Thoits (1982), looking at psychological distress in a normal adult population, found that those with higher occupational prestige have lower distress levels and higher amounts of social support; those in lower occupational groups reported more undesirable events. Bachrach and Zautra (1980) in an examination of the demographic characteristics of residence areas of clients (adults) utilizing a Salt Lake City mental health center, also found that the variable of low status occupations was one of the better predictors of service utilization. It would appear that there is evidence, from normal population surveys, supporting the hypothesis that those in lower occupations are at greater risk for distress (psychological and physical) than those in higher occupational groups. In addition, there may exist some variables which interact with occupational level

to moderate its influence on psychological functioning, such as social support, or exacerbate its effect, such as life events.

Several studies have investigated the relationship between occupational level and depression. Occupation has been found to be significantly related to depression in general practice patients (Barnes & Prosen, 1984), patients entering psychiatric treatment (Billings, Cronkite, & Moos, 1983), and for psychiatric in-patients (Dorus & Senay, 1980; Ihezue & Kamaraswamy, 1986). In all of these studies, significantly more of the depressed patients came from lower occupational groups. Ihezue and Kamaraswamy hypothesized that the socio-economic pressures caused by low earning power, rising inflation, plus family stress could contribute to the high incidence of depressive illness among unskilled, illiterate persons. The young student, urbanised, semi-literate, and the unskilled males of lower socio-economic status were identified as being at particular risk of developing depressive illness.

Occupational level has also been linked to schizophrenia. Salokangas (1978) found that, at the time of first hospitalization, unskilled workers and laborers were over-represented in the patient group, whereas among normals, skilled workers formed the largest group. During the subsequent seven and one half year follow-up, the occupational status of the control group increased, but for the inpatient group, the proportion of small business men and foremen decreased and the proportion of those who had lost their occupational status (i.e. became unemployed) increased.

Much of the literature addressing the issues associated with the mental health implications of income and occupational level, is found in the studies of social class or socio-economic status. Most often social class membership is defined by a combination of occupation (with its implications for income level) and educational level. Since occupational level plays a major role in the determination of socio-economic level, the research area of social class and mental health is of importance in the determination of the degree of potential economic stress present for an individual.

Since the 1953 study by Hollingshead and Redlich there has been a great deal of research interest in the relationship between social class and mental health. Their initial observation that mental illness was not randomly distributed in a population, but rather, that there is a concentration of neuroses at the higher socio-economic levels and psychoses at the lower end of the class structure (Hollingshead & Redlich, 1953) has been confirmed by other epidemiological studies (Bebbington, Hurry, Tennant, Sturt, & Way, 1981; Crisp, McGuinness, & Harris, 1978; Dilling & Weyerer, 1984; Halldin, 1985; Kessler & Cleary, 1980).

The effect of income on distress level, in general, and on the occurrence of specific disorders has also been an area of research interest. Studies of normal populations have shown low income to be significantly related to higher levels of symptoms and disorder (D'Arcy, 1982; Ilfeld, 1978; Leaf, Weissman, Myers, Tischler, & Holzer, 1984) while those with higher education, income and

occupational prestige have lower distress (Thoits, 1982).

Socioeconomic status has been found to be a significant variable in the prediction of depression (Bell, LeRoy, & Stephenson, 1982; Warheit, Holzer, & Schwab, 1973; Wold, Rosenfield, & Dwight, 1982; Hallstrom & Persson, 1984; Crowell, George, Blazer, & Landerman, 1986). Bland and Orn (1981) found that schizophrenic patients came predominantly from the lower social classes and that their families of origin also largely came from the lowest classes. In an investigation of suicide attempts, Bille-Brahe, Hansen, Kolmos, and Wang (1985) found that although significantly more attempters belonged to the lower social classes, unemployment and isolation were more important characteristics of those attempting suicide than income level per se.

The evidence for occupational level, income level, and socio-economic status as risk variables in psychological morbidity is fairly consistent. Surveys of normal populations as well as patient populations have found a consistent negative effect or behavioral cost associated with both lower occupational and income levels and the broader variable of lower social class.

Several theories and hypotheses to explain these results have been proposed. Social class differences reflect differential access to both material resources and treatment according to Allen and Britt (1983), Gibb (1980), Liem and Liem (1978), and Rodgers (1979). The concentration of disorder in the lower classes may be due to both an exposure to a higher number of stress factors (Gibb, 1980; Dohrenwend & Dohrenwend, 1969; Salokangas & Mattila, 1977, Warr & Payne, 1982)



and to a greater emotional vulnerability to negative life events (Dohrenwend & Dohrenwend, 1969; Kessler & Cleary, 1980; Turner & Noh, 1983). Levy and Rowitz (1973), Schubert and Miller (1978), and Goldstein (1979) suggested that the disorder gradient observed is at least partially due to the tendency of psychiatrists to label the behavior of those in the lower classes as symptomatic of a more severe disorder than would be diagnosed in a higher social class member. Those in the lower social classes are also those who are captured in reviews of admissions to public mental health facilities. Other researchers have concluded that it is the differing level of social support available to those in the lower classes that results in higher levels of disorder (Gibb, 1980; Turner & Noh, 1983). Thus access to resources, differential vulnerability, exposure to greater degrees of stress, lack of social support, and treatment variables may all be factors in the process which tends to identify those in the lowest educational and income groups as at greatest risk for psychological distress.

The effect of the occupational and income levels of parents on the individual has been examined in several studies. Gore and Mangione (1983) found that for normal adults (after controlling for sex and other social roles), while both high income and increased education were negatively related to depression at the level of the individual, the economic status of the parents was not significantly related. This result was consistent with the findings of Goldberg and Morrison (1963). After reviewing the admission files (first

admission) of schizophrenics, they concluded that the fathers of schizophrenics represented a typical cross section of the community in which they lived and that they had steady, solid work careers. They suggested that gross socio-economic deprivation is unlikely to be of major aetiological significance in schizophrenia. In a better controlled study, comparing schizophrenic patients (at the time of first admission) and matched controls, Salokangas (1978) found that although there was no difference in the social status of the parents at the time of birth of the individual, at the time of hospitalization the social status of the patients' parents was significantly lower than that of the control group's parents.

While, from the perspective of the research literature, it appears that the importance of parental socio-economic status is in some question (although the strongest study does lend support to the influence of parent economic variables), the hypothesis of a parental effect does have some intuitive appeal. One might hypothesize its possible importance both in terms of direct or indirect current stress, as well as within a perspective of historical stress level and learned coping styles.

#### Employment Status.

Research interest in the effect of employment status (unemployment, part-time employment, or full time employment) has broadly been divided into two areas: (a) research into the benefits accruing from employment, and (b) the undesirable effects of unemployment. While the majority of the research has centered on the

latter area, results from studies of beneficial effects of employment also have implications for potential costs arising from the loss of a job.

The very presence of a full-time job has been found to be beneficial to one's mental health. Gore and Mangione (1983) and Anashensel, Frerichs, and Clark (1981) in survey studies of normal populations, found that the presence of work, particularly full-time work, was related to lower levels of depression. Both groups of researchers went on to hypothesize that it is the difference in employment and social roles which explains the sex differential for depression; women are less likely to be employed, especially fully employed, and this may, in itself, place them at greater risk for depression. Employment may also be of benefit in contributing to the fit of the individual in his or her environment (Kessler & McRae, 1981).

While one obvious benefit of employment is economic security, there are probably other indirect benefits. Jahoda (1979), Liker (1982), and Kabanoff (1982) identified several extra-economic benefits of employment: a source of self respect, social support and contacts, and structured, habitual activity. Jenkins, MacDonald, Murray, and Strathdie (1982) reported that the concerns of white collar workers, threatened with unemployment, included financial implications, loss of status, loss of job satisfaction, and loss of colleagues. These concerns further illustrate the perceived benefits associated with employment. Feather and Davenport (1981), Banks and Jackson (1982),

and Warr, Jackson, and Banks (1982), in longitudinal studies of the effects of unemployment on youths sixteen and seventeen years old, generally found that while those unemployed did exhibit lower self esteem and higher levels of depression, the difference between those employed and those unemployed was due more to the positive changes among those who found employment than to any negative effect due to loss of employment. Thus it would appear that employment not only reduces economic pressures, but also has many positive, non-economic associate benefits.

The research results concerning the effect of employment on women as compared to men parallels the changing involvement of women in the work force. In comparing the effects of unemployment on women in 1950s and 1970s surveys, Kessler and McRae (1981) concluded that changes in surveyed levels of distress (showing a decrease from the 1950s to the 1970s) was due to the increased participation of women in the work force. Roberts, Roberts, and Stevenson (1982) and Warr and Parry (1982) also found that while women have enjoyed the mental health benefits of employment, they have also suffered the negative effects of unemployment, just as had traditionally been found for men. While work outside the home may have positive consequences, it also can lead to depression due to family stresses (Warr & Parry, 1982), such as dissatisfaction with child care (Krause, 1984). Thus, it would seem, in the 1980's, with the convergence of work roles (Anashensel, Frerichs, & Clark, 1981) women are seeing the mental

health benefits of employment, but this may be tempered by the stresses of other family role demands.

Hill (1978) hypothesized that those having experienced a job loss go through three phases: (a) initial response (traumatic to denial), (b) intermediate phase (acceptance then intertia), and (c) settling down to unemployment (adjustment to new standard of living and lifestyle). Kasl, Gore, and Cobb (1975) also suggested three phases in unemployment: anticipation of unemployment, unemployment, and probationary re-employment.

Support for a phasic response to the experience of unemployment has been found based on the measurement of physical and psychological stress levels of workers during the period of time preceding and following unemployment (Kasl, Gore, & Cobb, 1975; Swineburne, 1981). Jackson and Warr (1984) found workers' psychological health was consistently better for those unemployed two to three months, than for those unemployed one to two months; this they labelled an "initial shock effect".

Studies of the effects of mental health implications of unemployment have utilized three sample populations: normal, out-patient, and in-patient. The majority of studies have examined only one of these groups, looking for a behavioral cost, but a few have included two or all three population samples for comparison. These latter studies provide some of the strongest evidence for psychological/psychiatric morbidity associated with unemployment.

A large number of survey studies have examined the unemployment experience in normal populations and in specific groups of interest within the normal population (such as women, blue-collar workers, white collar workers, youths). While, overall, the results do appear to confirm the intuitive behavioral cost of unemployment, the unique findings and limited samples utilized, caution one from making any blanket generalizations with respect to a universal negative effect of unemployment.

Survey studies have suggested that for most people there is a negative cost associated with unemployment. Lower self esteem, self dissatisfaction, greater stress, and higher levels of depression have been found among unemployed adults (Baum, Fleming, & Reddy, 1986; Cochrane & Stopes-Roe, 1980; Cohn, 1978; D'Arcy, 1982; Feather, 1982; Finlay-Jones & Eckhardt, 1981; Gore & Mangione, 1983; Layton, 1986; Noll & Dubinsky, 1985; Warr & Payne, 1982). These studies, and others, have uncovered a potentially large number of other variables which may interact with unemployment in determining the degree of disorder resulting from losing a job. A few of the more consistently found interaction variables are occupational level (Cohn, 1978; Rajer, 1982), length of unemployment (Hepworth, 1980; Jackson & Warr, 1984), age (Jackson & Warr, 1984; Warr, Jackson, & Banks, 1982; Banks & Jackson, 1982), and gender (Kessler & McRae, 1981; Anachensel, Frerichs, & Clark, 1981; Krause, 1984; Roberts, Roberts & Stevenson, 1982).

An interesting effect is found in comparing the impact of unemployment upon blue collar versus white collar workers. It appears that white collar workers suffer fewer negative effects than blue collar workers (Cohn, 1978; Thomas, McCabe, & Berry, 1980; Hartley, 1980) who, in turn, may suffer fewer negative effects than those without a trade (Hepworth, 1980). Blue collar workers are more likely to suffer from decreased self esteem, greater self dissatisfaction and increased levels of depression after losing a job, while these effects seem to be much less severe among white collar workers. In fact, one researcher, Hartley (1980), has suggested that white collar workers may even view unemployment as a career opportunity! It seems possible that the wider variety of employment opportunities and better economic circumstances of white collar workers may make the unemployment experience less threatening and uncertain.

The effect of the unemployment experience may also be affected by the area of residence of the unemployed person. Researchers, such as Cohn (1978), have found that those living in an area of low employment, who become unemployed, express significantly greater dissatisfaction with themselves (blame themselves for being unemployed) than those living in an area of higher unemployment. Platt and Kreitman (1985) found a similar interaction between unemployment and local employment conditions in an investigation of parasuicide and unemployment. The unemployment experience may also be different for those living in urban versus rural areas (Dooley, Catalano, Jackson, & Brownell, 1981). While one might hypothesize

that greater amounts of social support available in both rural areas (Gore, 1978) and among groups of unemployed might account for these results, caution is necessary, as at least one study (Ullah, Banks, & Warr, 1985) has identified social support as relatively unimportant in accounting for variation in distress scores among the unemployed.

The overall finding, linking an age effect to the unemployment experience, has been that unemployment has its least effect on those nearing or at retirement age, and young adults; the effect seems to be greatest for middle-aged males (Jackson & Warr, 1984; Cormier & Klerman, 1985). The observation that unemployment has its greatest mental health consequences for those of middle age, may further be tied to the findings that work involvement and positive work attitudes affect the degree of cost of unemployment. Feather and Davenport (1981), Feather (1982), Stafford, Jackson, and Banks (1980), and Jackson and Warr (1984) all found that the negative effects of unemployment were greatest for those individuals who were highly motivated to work, those who had a high level of work involvement, and those who were in need of a job. Thus for the middle-aged group especially, the interaction of age and work commitment may place them at greater risk for the negative effects of unemployment. Not only does it appear that middle-aged workers are at greater risk for adverse effects of unemployment, but for those over sixty years of age, their age also makes it more likely that they will remain unemployed for longer (Aiken, Ferman, & Sheppard, 1968).



Length of unemployment is another important aspect of the unemployment experience (Baum, Fleming, & Reddy, 1986; Feather & Barber, 1983; Jackson & Warr, 1984; Linn, Sandifer, & Stein, 1985). Overall, this group of researchers did identify length of unemployment as negatively correlated with mental health measures and they did find some evidence in support of the hypothesis of stages in the unemployment experience. For the first two months of unemployment, it appears that length of unemployment is negatively correlated with psychiatric morbidity (Jackson & Warr, 1984) as well as with physical stress measures (Baum, Fleming & Reddy, 1986). By the sixth month of unemployment, mental health appears to stabilize (Aiken, Ferman, & Sheppard, 1968; Jackson & Warr, 1984; Linn, Sandifer, & Stein, 1985) but continues to be poorer than that of employed workers. Contrary to these results, Melville, Hope, Bennison, and Barraclough (1985) did not find an effect for length of unemployment. This result can not be reconciled with the other research studies; this study was comparable in terms of sample characteristics and time period examined. Further research in this area investigating single as well as interactive effects of length of unemployment, length of prior employment, age, location and other potential variables may resolve this difference.

Other studies have focused on in-patient psychiatric populations and the hypothesized effect of unemployment on these people. Unemployment has been shown to be a risk factor for depression among in-patients (Cooke, 1982; Roy, 1978, 1981a, 1981b) and a predisposing factor for suicide (Lendrum, 1933; Lester, 1970; Bille-Brahe, Hansen,

Kolmos, & Wang, 1985). It has also been found to play a role in re-admission, with higher rates of unemployment among those readmitted, but only for male patients (Holsten & d'Elia, 1985; Richart & Millner, 1968).

The effect on an individual's mental health of the employment status of a spouse has not been well investigated. From the studies reviewed, the results are confusing. Bebbington, Hurry, Tennant, Sturt and Way (1981) found that for urban women, having an unemployed husband was associated with an increased risk of psychiatric disorder, but for men, an increased risk of disorder was associated with having an employed spouse. In contrast, Roberts & O'Keefe (1981) found that the employment status of a wife had no effect upon depression scores for men. Further research is needed in this area to clarify the relationships between spouse, employment, and disorder.

In examining the wealth of studies linking unemployment and psychological morbidity, it becomes apparent that there is a cost associated with unemployment. It would appear that, while there may be general stages in the response to unemployment, the effect is probably subject to individual variations according to occupational level and age. Individuals are probably not equally vulnerable to possible adverse impact of the job loss experience, and other variables (such as location and social support) probably have important interactive effects. While many researchers have hypothesized links between various stresses, which have been associated with unemployment, in an attempt to explain the multitude

of results, no one has yet proposed a pathway between the experience of unemployment and disorder, accounting for some, or all, of the interacting variables. Unemployment is clearly a risk factor for many groups, but the exact mechanism of action is not yet clear.

#### Economic Mobility.

The term economic mobility refers to any change in a person's economic status, either through change in employment status or change in income level, in either an upward or downward direction. Debate within the area of economic mobility, parallels and draws upon the life events debate as to whether only negative change events are associated with mental health morbidity, or if any event, positive or negative, has an associated cost. In contemplating possible stress effects of mobility, one could argue that both upward and downward mobility could be stressful, but for differing reasons and with potentially differing results depending upon the effects of other variables.

While most of the research on economic mobility has been focused on a single direction of mobility, such as job loss (e.g. Kessler, House, & Turner, 1987; Oliver & Pomicter, 1981; Parnes & King, 1977; Sheperd & Barracough, 1980) or income maintenance programs (Thoits & Hannan, 1979), there has also been interest in the effects of mobility in either direction (Burke, 1986; Kessler & Cleary, 1980; Sheperd & Barracough, 1980). The most commonly examined event with economic mobility consequences is job loss. From the research previously cited in this paper on the effects of unemployment, it would appear that

such a catastrophic negative change in economic status can potentially have mild (i.e. self dissatisfaction) to severe (i.e. suicide) health implications. Oliver and Pomicter (1981), in a sample of assembly line workers, found that among those layed off, employment/financial variables preempted demographic variables in predicting depression, once again identifying the potential importance of economic stress in the onset of distress.

Loss of a job can be only the initial event in a downward employment and economic slide. Both Parnes and King (1977) and Burke (1986) noted that a major long term impact of job displacement was a substantial deterioration in occupational status. Burke (1986) surveyed employees sixteen months after a plant closing, and found that the majority of former employees were in relatively worse financial circumstances: only one third of those sampled had found employment, and of those re-employed, 72% were earning significantly less money than in their previous job. Those re-employed individuals who experienced the greatest drop in earnings were older, main bread winners, and those unemployed for a longer period; they reported significantly higher alcohol consumption, more psychological symptoms and rated their present job unfavorably. Burke concluded that having fewer resources for maintaining one's standard of living is stressful and the realization that one is moving downward may be psychologically and emotionally debilitating. Although this study suffered from the sample selection problems inherent in mail surveys, it did confirm the earlier findings of Oliver and Pomicter (1981) and Parnes and King

(1977). In contrast, Kasl (1982), after examining job loss and the subsequent re-employment experience of a group of blue collar workers, found that those re-employed expressed job satisfaction equal to or higher than that for the previous job. Obviously, the individual experience and perceptions associated with a re-employment experience must have an influence upon the emotional effect of a job loss and re-employment period. These studies have drawn attention to the ongoing economic stresses and downward mobility of those unemployed that may continue beyond the job loss event itself.

Not only downward economic mobility, but also upward mobility may have health consequences. Kessler and Cleary (1980) found that not only did those in higher social classes experience significantly fewer health problems and undesirable events, but in addition, those who were upwardly mobile were less influenced by events than the non-mobile and downwardly mobile. The findings of Sheperd and Barraclough (1980) and Eaton and Larsy (1978) complicate the picture of the effect of mobility on mental health. Sheperd and Barraclough found a trend toward greater social mobility (in both directions) among suicides, but the nature of a downward mobility change (voluntary or involuntary) may be important. Among suicides, involuntary downward mobility was found, whereas among the normal controls, the downward mobility represented a planned decision. Eaton and Larsy (1978) also identified upward mobility as a potential source of psychological disorder among a group of immigrants. They found that among those who had experienced a job change, particularly those

with a recent change, upward mobility was associated with dissatisfaction and psychiatric symptomatology.

These studies, concerning the effects of economic mobility on mental health, do suggest that economic mobility may be an important variable for consideration in an environmental stress model. The complexity of the results concerning mobility would appear to indicate that there may be both independent and interactive effects of mobility with social class, occupational level and demographic variables upon mental health measures. A clear conclusion regarding the influence of mobility on mental health must await further research and more complex research designs encompassing multiple variables and effect levels.

#### Drawbacks of Individual Level Research

Numerous criticisms of the individual level approach to research into the implications of economic events for mental health, have been raised. Dooley and Catalano (1986), in an extensive examination of both aggregate and individual level studies, presented many of the drawbacks apparent in reviewing the individual level studies discussed in this paper. These included general design problems, sample limitations, and problems concerning the measurement of the economic and distress variables.

In a comprehensive review and critique of both individual and aggregate level studies, Dooley and Catalano (1986) presented several general criticisms of the individual level approach. In avoiding the threat of the ecological fallacy (according to Dooley and Catalano),

individual level of analyses fail to measure the relationship between the economic environment (as tapped by aggregate level research) and individual disorder. Job loss occurs not only in communities undergoing economic decline, but also in healthy communities, and (as discussed previously) the experience of unemployment may be quite different. This interaction between the economic climate of the community and the individual level economic experience may also help to explain some of the divergent findings of studies, both at the individual and aggregate levels. By omitting this potential variable, individual level studies may be losing a component of the explained effect which, if included, might result in stronger associations between economic variables and mental health consequences.

Gurney and Taylor (1981) as well as Dooley and Catalano (1986) further hypothesized that other types of employment changes might also have mental health consequences. During a period of recession, changes in employment conditions might include reduced working hours, changes in work routines, decreased income, disruption of social ties, concerns about the economic situation of friends and family, and reluctance to leave an undesirable job. These represent potential economic and social stresses for those still employed. Effects, such as these, acting on those still employed, would not be included in individual level studies of only unemployed individuals, and as a result, these studies may underestimate the total cost of economic decline.

Individual level studies are also limited by their examination of only a single intervening mechanism (Dooley & Catalano, 1986), for example, between job loss and increased distress or social class and distress. Aggregate correlations, by contrast, represent the sum of all direct and indirect causal pathways from the economic variable to the outcome variable. Thus aggregate level research, due to its tapping of the sum total of effects on a community and larger samples, is better able to capture the subtle shifts in the community than is individual level analysis. The concentration of individual level studies on relatively short term effects may also miss any longer term or cumulative impacts of economic change. These limitations may help to account for some of the weaker associations between economically related variables and psychological distress commonly found in individual level studies as compared to aggregate studies.

Several limitations, with respect to the data from the population samples generally found in individual level studies, have been noted. In particular, the lack of base line mental health data (i.e. prior to the economic events) for subjects leaves open the possibility of reverse causality (Aldwin & Revenson, 1986; Catalano & Dooley, 1981; Dooley & Catalano, 1986): previously existing disorder may have led to job loss. Pre-existing symptoms may also influence the reporting both of stress and its consequences (Aldwin & Revenson, 1986).

The weak results found in individual level studies may also be due to the choice of outcome measures employed (Catalano & Dooley, 1981; Dooley & Catalano, 1986). Individual level studies have used



dependent variable measures ranging from self-satisfaction scales, diagnostic screening devices or interview data, to service utilization, all of which have inherent disadvantages and may not tap equivalent effects. Those which have used such mild symptom measures as dissatisfaction are particularly questionable: both the type of mental health effect and the severity of the effect are probably not comparable to the more clinical devices. As a result, their findings may not translate into similar patterns for more clinical indices (Dooley & Catalano, 1986). Studies employing diagnostic screening devices, while at least representing more objective measures than interview data or satisfaction surveys, are potentially questionable on other validity grounds. Dunham (1976) questioned whether mental illness could even be reliably differentiated into qualitatively distinct syndromes, or whether it was a more general entity. If only general distress is measured, though, any differential effects with respect to specific disorders are lost. Given the potential importance of these interactions, it would seem to be of value to use diagnostic categories, but the questionable comparability of categorization between studies must be kept in mind.

Utilization of mental health services as the dependent measure of behavioral cost has drawbacks as well (Dooley & Catalano, 1986). Mental health services are provided by a variety of agencies varying from in-patient and out-patient psychiatric facilities to private practitioners (psychologists and physicians) to informal sources (ministers, non-professionals, etc.). Most studies collect data from

one institution (usually formal treatment facilities), thus the possible range of levels of effect may be limited. Since those studies using utilization or diagnosis include only those served by a particular facility, inclusion in the study is dependent upon admission to that facility. As was mentioned with respect to aggregate studies, data collection from any single institution has drawbacks. Admission of an individual to a facility may be influenced by variables such as the differing admission criteria, both between institutions and between workers in the same institution, availability of beds, and the availability of community resources (Dooley & Catalano, 1986). These variables may influence both utilization and diagnosis as dependent variable measurements.

Silverman and Saunders (1980; 1983; 1984) have also hypothesized that the very presence of a psychiatric facility in an area may influence admissions by creating a "mental illness culture" in which residents are more likely to interpret their reactions to their problems as possible signs of mental illness. While this hypothesis has been criticized by Cyr and Haley (1983a, 1983b) (contending that the higher admission rates for areas adjacent to psychiatric facilities are due more to patient migration rather than any change in the perception of symptoms), it does identify another potential variable which might affect the perception of distress within a community and the seeking of treatment.

As mentioned previously in this paper, formal life events measures or informal data collection of prior events, utilized by some

individual level studies, as the measure of economic stress, are also subject to several reservations. Events of potential importance which could be collected by interview may not be included in life events schedules, according to Bebbington, Tennant, Sturt and Hurry (1984), but interview data tend not to be systematic, thus events may also be missed. The collection of retrospective data (either by structured or unstructured means) is always subject to selective memory, but even of more importance is the question of pre-existing disorder either directly or indirectly causing the economic event, e.g. job loss or decline in income (Aldwin & Revenson, 1986; Dooley & Catalano, 1986).

Many of the problems associated with individual level research are shared with aggregate studies. While the aggregate and individual approaches have suggested a variety of important economic variables, ranging from the community economic environment to aspects of the individual's economic environment (employment status, occupational level, socio-economic status) which appear to have both direct and interactive effects upon the well-being of the individual, both approaches suffer from limitations associated with the determination of the study population, the measurement of the dependent variable, and identification of specific economic variables. While longitudinal, large scale, prospective studies would address many of the concerns voiced by Dooley and Catalano and others, the difficulties in mounting such an effort would seem prohibitive.

The purpose of the present study is three fold: first, within the economic psychology hypothesis relating negative environmental

risk factors to subjective behavioral cost, this study will investigate whether or not a newly developed questionnaire, the Economic, Demographic and Social Characteristics Questionnaire (MacFadyen & MacFadyen, 1984), designed to capture and quantify many of the environmental risk factors discussed in this chapter, can differentiate between groups of individuals who differ in terms of behavioral cost; second, to test the hypothesis that increases in environmental risk are linked to an increase in subjective behavioral cost, where behavioral cost will be measured by using a general distress index, the Global Symptom Index of the Symptom Checklist 90 (Derogatis, 1977; Derogatis, Lipman, Covi, & Rickels, 1973) and Brief Symptom Inventory (Derogatis, 1975; Derogatis & Spencer, 1982); third, to examine the specific relationship between economic risk factors alone and the measure of behavioral cost.

#### Statement of Hypotheses

The hypotheses to be tested include those pertaining to the measurement of symptomatology, general environmental risk and specific economic risk. They have been divided into two categories: general hypotheses and economic risk hypotheses.

#### I. General Environmental Risk and Behavioral Cost Hypotheses

i) Hypothesis I: The psychological distress measure (GSI of the Symptom Checklist-90/Brief Symptom Inventory) will differentiate the in-patient and out-patient samples and in-patients will have a higher level of psychological distress than the out-patient sample.

ii) Hypothesis II: The clinical sample (combined in-patient and out-patient samples) will have higher total environmental risk scores on the Economic, Demographic, and Social Characteristics Questionnaire than the normal population sample, where environmental risk will increase with severity of problem, as indicated by group placement.

iii) Hypothesis III: Those patients (out-patients and in-patients) identified as at greater environmental risk will be more likely to have high psychological distress scores than those identified as at lower environmental risk.

iv) Hypothesis IV: There may be a specific pattern of environmental stressors (as indicated by the Economic, Demographic and Social Characteristics Questionnaire subscales) which can differentiate between the sample groups (normal, out-patient, and in-patient).

## II. Economic Risk Hypotheses

i) Hypothesis V: The clinical sample will have higher risk scores on the economic subscale of the EDSCQ than the normal sample, and in addition, the in-patient sample will have higher risk scores than the out-patient sample.

ii) Hypothesis VI: There may be a specific pattern of economic stressors which can differentiate between the sample groups (normal, out-patient, in-patient).

## CHAPTER THREE

## PROCEDURE AND STATISTICAL ANALYSIS

Procedure

Three, adult, sample populations were utilized for this study: a normal sample (N = 150), an in-patient sample (N = 400), and an out-patient sample (N = 264).

The normal sample data was collected from September 1, 1985 to December 1, 1985, as a part of the Calgary Health Services survey of 1000 Calgary residents. The sample was stratified so that it was representative of the Calgary area population with respect to age, sex, location and average income. All subjects were contacted via telephone for the collection of general health information and, in addition, requested to volunteer to, anonymously, complete the Economic, Demographic, and Social Characteristics Questionnaire (EDSCQ) (MacFadyen & MacFadyen, 1984). Six hundred individuals from the original sample agreed to volunteer and were subsequently mailed a copy of either the adult or child form of the EDSCQ. Each form was only identified by a location code. Of the 600 questionnaires mailed out as a part of the health survey, 266 completed questionnaires were returned; of these 150 were the adult form of the EDSCQ. The data from these 150 individuals formed the normal sample for the present study. Further details of the sample demographics are included in Table I.

The in-patient sample (N = 400) was collected between September 1, 1984, and March 31, 1987, at a large, central Calgary hospital (Hospital A). All patients admitted to the psychiatric units were

TABLE 1

Socio-demographic Characteristics of the Samples

| Characteristic    | Percentages |             |            |
|-------------------|-------------|-------------|------------|
|                   | Normal      | Out-patient | In-patient |
| Age               |             |             |            |
| 16 - 25           | 18.7        | 21.1        | 26.3       |
| 25 - 35           | 36.7        | 36.2        | 34.8       |
| 36 - 45           | 12.7        | 19.5        | 15.8       |
| 46 - 55           | 13.3        | 6.5         | 11.5       |
| 56 - 65           | 8.7         | 1.6         | 8.0        |
| 66 - 75           | 6.0         | 0.0         | 2.5        |
| 76 - 85           | 2.7         | 0.0         | 0.5        |
| 86 - 95           | 0.7         | 0.0         | 0.0        |
| missing           | 0.7         | 15.0        | .75        |
| Sex               |             |             |            |
| Female            | 52.7        | 63.4        | 61.8       |
| Male              | 46.7        | 36.2        | 38.0       |
| missing           | 0.7         | 0.4         | 0.2        |
| Ethnic Background |             |             |            |
| Caucasian         | 95.3        | 90.2        | 91.8       |
| Oriental          | 2.7         | 2.0         | 1.8        |
| East Indian       | 2.0         | 0.4         | 0.5        |
| Arab              |             | 0.8         | 0.0        |
| Metis             |             | 1.2         | 2.5        |
| Negro             |             | 0.0         | 0.8        |
| Treaty Indian     |             | 0.8         | 1.5        |
| non-Treaty Indian |             | 0.4         | 0.5        |
| Eskimo            |             | 0.0         | 0.3        |
| other             |             | 1.6         | 0.5        |
| missing           | 0.0         | 2.0         | 0.0        |

TABLE 1 (continued)

Socio-demographic Characteristics of the Samples

| Characteristic               | Percentages |             |            |
|------------------------------|-------------|-------------|------------|
|                              | Normal      | Out-patient | In-patient |
| Native Language              |             |             |            |
| English                      | 88.7        | 93.5        | 90.3       |
| French                       | 0.7         | 1.2         | 2.0        |
| Ukranian                     | 0.0         | 0.0         | 0.5        |
| Other European               | 6.7         | 3.7         | 4.0        |
| other                        | 4.0         | 1.6         | 3.3        |
| missing                      | 0.0         | 0.0         | 0.0        |
| Education (completed)        |             |             |            |
| University                   | 40.0        | 26.8        | 13.3       |
| Technical or business school | 24.7        | 22.0        | 22.0       |
| Apprenticed trade            | 4.7         | 4.5         | 4.8        |
| Secondary school             | 27.3        | 43.1        | 45.0       |
| Elementary school            | 2.7         | 2.8         | 13.3       |
| Less than grade six          | 0.7         | 0.8         | 1.8        |
| missing                      | 0.0         | 0.0         | 0.0        |
| Marital Status               |             |             |            |
| Married                      | 33.3        | 42.2        | 31.0       |
| Single                       | 35.3        | 25.2        | 36.8       |
| Widowed, > 2 years           | 11.3        | 0.8         | 2.5        |
| Divorced, > 2 years          | 4.7         | 7.3         | 10.3       |
| Separated, > 2 years         | 4.0         | 3.3         | 3.5        |
| Widowed, < 2 years           | 3.3         | 1.2         | 1.0        |
| Divorced, < 2 years          | 1.3         | 2.0         | 2.3        |
| Separated, < 2 years         | 2.0         | 11.4        | 6.5        |
| Common law                   | 4.7         | 6.5         | 6.3        |
| missing                      | 0.0         | 0.0         | 0.0        |



approached within two weeks of admission and asked whether they would volunteer to complete the EDSCQ and the Brief Symptom Inventory (BSI) (Derogatis, 1975). Completion time for the two questionnaires was approximately 30 minutes. Details of the sample characteristics are included in Table I.

The out-patient sample was drawn from two sources. Commencing in May, 1984, and continuing until March, 1987, therapists at Hospital A were requested to approach new out-patients to volunteer to complete the EDSCQ and the BSI (Derogatis, 1975; Derogatis & Spencer, 1982). Data from sixty subjects was collected from Hospital A. Subsequently, data collection was initiated at another large Calgary hospital (Hospital B). At this facility all new, out-patient admissions (N = 186), between June, 1986, and May 31, 1987, completed both the EDSCQ and the Symptom Check List (SCL-90) (Derogatis, 1977; Derogatis, Lipman, Covi, & Rickels, 1973). After initial analysis indicated that the two out-patient samples were comparable, they were pooled for subsequent statistical analysis, creating a single, out-patient sample (N = 264). Table I provides further details of the demographic characteristics of the sample.

#### Instruments Used in the Study

Individual environmental risk was measured by the Adult Form of the Economic, Demographic, and Social Characteristics Questionnaire (EDSCQ) (see Appendix I), developed in 1984 by MacFadyen and MacFadyen. Based upon risk variables identified by research studies, the 63 multiple choice items of the EDSCQ were constructed with each

item representing either an individual, social, economic, or demographic factor.

The items contained in this questionnaire are organized into four subscales: an individual integration subscale, a social subscale, an economic subscale, and a demographic subscale. The Individual Scale consists of seven items relating to marital status, ethnicity (language, citizenship, racial origin), and education. This scale is designed to reflect the degree of integration or match between the individual and the community. The Social Scale, with 20 items, deals with quantitative aspects of support from family, close friends, and acquaintances. Economic risk is encompassed in the Economic Scale. This scale is composed of 20 items relating to the personal economic environment. Those individuals with a spouse, or ex-spouse who contributes financially to the family unit, complete a further five items, which constitute the spouse scale, relating to the economic environment of their spouse. Finally, the Demographic Scale, with nine items, includes items relating to place of residence (area, and community facilities) and residential mobility.

Each item consists of a question with several alternative answers, ranging from low to high risk. The relative ordering of the responses, from low to high environmental risk was designed to be consistent with the risk associated with various environmental conditions, as reported by research studies. Although the number of choices available varies between items, a maximum score of ten was assigned to the highest risk response for each item, and the other

responses are scored by their relative proportion. For example, item 4.420 asks:

- What is your employment status:
- (1) Unemployed by choice (e.g., student, homemaker);
  - (2) full-time employment;
  - (3) part-time employment by choice;
  - (4) retired;
  - (5) part-time employment but would like full-time work;
  - (6) unemployed and want employment.

If the first response to the item was selected, then the score for the item would be  $1/6 \times 10 = 1.7$ ; if the second response was selected, then the item scores would be  $2/6 \times 10 = 3.3$ ; and if the sixth response (representing the highest risk) was selected, the score would be  $6/6 \times 10 = 10$ .

Subscale raw scores represent the cumulative total for the items incorporated within each particular scale. The Individual Scale, with seven items, has a maximum possible score of 70; the Social Scale, with 20 items, has a maximum possible score of 200; the Economic scale, with 20 items, has a maximum possible score of 200; and the Demographic Scale, with nine items, has a maximum possible score of 90. Thus, the maximum possible total raw score (the total of the four subscale scores) for an individual on the EDSCQ would be 560. When the optional, spouse scale is used, an individual could receive a maximum score of 610. In order to ensure comparability between subscales in scoring, the subscale totals were converted to proportion scores (calculated by dividing the raw score for a subscale by the maximum possible score, i.e.  $X/70$ ,  $X/200$ ,  $X/200$ ,  $X/90$ ), and the Total

Environmental Risk proportion score calculated by averaging the four subscale proportion scores. In the present study, the Total Environment Risk proportion score was utilized as the measure of general environmental risk and the Economic Risk proportion score was used as the measure of economic risk. The spouse scale was included only in post hoc analyses to provide further information as to the contribution of the spouse/ex-spouse's economic environment to the risk level of the individual.

The results of a factor analysis of the EDSCQ (Schindelka, 1986) did confirm that there is a general risk factor, as well as other factors that could be identified as economic, social support, demographic, and individual integration factors. These findings (utilizing an in-patient sample, N = 170) are consistent with the logical and empirical structure of the EDSCQ. Further, Schindelka also found that all three levels of analyses (item level, subscale level, and total stress score) of the EDSCQ significantly predicted symptomatology (i.e., higher environmental stress levels were associated with higher levels of symptomatology). She concluded that the environmental risk factors making up the EDSCQ were a measure of stress and that the instrument was a useful and valid instrument in the assessment of environmental risk.

For the purposes of the present study, the EDSCQ provided a mechanism for the collection of comprehensive environmental information and in particular, comprehensive economic data in a quantitative form. Although only preliminary validity data for the

EDSCQ, based on this in-patient sample, is available (Schindelka, 1986), it is the only objective and comprehensive instrument available at present for the collection of environmental data.

The measures of psychological distress utilized in this study were the Symptom Check List (SCL-90) developed by Derogatis, Lipman, and Covi (1973), and Derogatis (1977), and the Brief Symptom Inventory (BSI) developed by Derogatis (1975) as an abbreviated form of the SCL-90. Correlations of .92 to .98 between the symptom dimension scores of the two scales have been reported, and Derogatis and Spencer concluded that, in light of these high correlations, the BSI and SCL-90 measure the same symptom constructs (Derogatis & Spencer, 1982). Both of these self-report symptom inventories were designed to record the psychological symptom patterns of psychiatric and medical patients in research and clinical settings where an instrument, which surveyed a broad array of psychiatric symptoms in a limited time (10-20 minutes) would be useful.

The SCL-90 is comprised of 90 distinct items. Each item is rated by the subject, on a five-point scale of distress ranging from (0) not at all, (1) a little bit, (2) moderate, (3) quite a bit, to (4) extremely, with reference to their experience of the symptom in the preceding week. The BSI is scored and interpreted in the same manner as the SCL-90 and differs only in the number of items (53 items).

Both instruments are scored on nine symptom dimensions (somatization, obsessive-compulsive, interpersonal sensitivity,

depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism) and three global indices (Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total). Of the global indices, only the Global Severity Index (GSI) raw score was considered for the purposes of the present study, as it combines information on both the numbers of symptoms and the intensity of the distress.

The norms for the SCL-90 and the BSI (Derogatis, 1977; Derogatis & Spencer, 1982) are based on four sample populations: (1) non-patient normal sample, N = 971; (2) psychiatric outpatient sample, N = 1002; (3) psychiatric in-patient sample, N = 310; (4) adolescent, non-patient sample, N = 2408. Raw scores can be transformed into standardized T scores for any of the four populations. Separate norms are available for males and females. For the purposes of the present study, raw GSI scores were utilized so that comparisons between the three sample populations could be directly made.

Research to date indicates that the SCL-90 and the BSI are reliable and valid instruments for the measurement of psychiatric symptomatology. A study to establish the convergent validity of the SCL-90 with the MMPI, using 209 symptomatic volunteers, compared the component dimensions of the SCL and BSI with various scales of the MMPI (Derogatis, Rickels, & Rock, 1976). Each symptom dimension of the SCL and BSI were found to correlate most highly with the MMPI scale considered to measure a corresponding symptom construct (correlations varied from .50 for the respective phobic scales to .84

for the psychoticism scales). As compared to the convergence between the SCL-90 and the MMPI, the correlations for the BSI dimensions of Interpersonal Sensitivity, Anxiety and Depression with the MMPI scales were nearly identical. Although the correlations for Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism were slightly lower than for the SCL, the pattern of correlations was retained. It would seem that in spite of the reduced length of the BSI as compared to the SCL-90, the validity of the dimensions has been maintained (Derogatis & Spencer, 1982).

Derogatis and Cleary (1977a) found further evidence of the validity of the SCL (and BSI) through a principle component analysis of data from psychiatric out-patients (N = 1002). Nine interpretable factors were derived from the analysis. The nine-dimensional clinical-rational structure was compared to the dimensional structure empirically determined from the analysis of the out-patient data. The hypothetic versus empirical match was judged to be very good for eight of the nine dimensions and moderate on the ninth (psychoticism).

Further support for the construct validity of the SCL was also found in the comparison of the factor analysis of a subset of 31 items of the SCL (using data from psychiatrists' rating of 837 neurotic outpatients using the SCL) with four clinically derived clusters (Derogatis, Lipman, Covi, & Rickels, 1970). Results of the analysis indicated an extremely high coincidence between the clinical clusters and the transformed factors; this finding led the researchers to

conclude that there was strong evidence for the reliability and validity of the SCL.

The reliability of the SCL was investigated using data from psychiatric outpatients (425 males and 577 females). Eight of the nine factors showed marked constancy in factorial composition across gender, while the ninth factor (paranoid ideation) showed only moderate invariance characteristics (Derogatis & Cleary, 1977b).

The SCL-90/BSI inventories were selected for use in the present study because they provide a brief but reliable index of symptomatology which is easily administered and scored.

### Statistical Analysis

#### I. General Environmental Risk and Behavioral Cost Hypotheses

##### Hypothesis I

To investigate whether the out-patient and in-patient samples differed with respect to level of symptomatology, as measured by the General Symptom Index of the SCL-90 and BSI, an analysis of variance was carried out, with GSI as the dependent variable and patient group (out-patient, in-patient) as the independent variable. SPSS ANOVA was utilized for the analysis.

##### Hypothesis II

The effect of subject group (clinical versus normal) upon environmental risk was examined using a one-way analysis of variance (SPSS ONEWAY). To further inquire into any difference between the patient groups, a second analysis of variance utilizing all three subject groups (normal, out-patient, and in-patient) and total



environmental risk was performed also using SPSS ONEWAY with a post hoc Scheffe test. For each analysis, Total Environmental Risk proportion score was the dependent variable and subject group was used as the independent variable.

The additional influence of marital status (i.e., the presence of economic support from a spouse or ex-spouse) upon environmental risk for the individual was examined in a post hoc analysis (SPSS ANOVA). Subject group (normal, out-patient, and in-patient) and marital status (married or ex-spouse contributing, single) were used as the independent variables and Total Environmental Risk proportion score was the dependent variable for the analysis of variance.

### Hypothesis III

An initial examination of the prediction of symptomatology (GSI) by environmental risk (as measured by Total Environmental Risk proportion score) was done for the total clinical sample using a bivariate regression analysis. Pearson product moment correlations between symptomatology (GSI) and the EDSCQ subscale and Total Risk proportion scores were then computed to determine the strength and direction of the associations. The inter-relationships between the EDSCQ Total Risk proportion score and the subscales, as measured by the Individual Risk proportion score, Social Support proportion score, Economic proportion score, and the Demographic Risk proportion score, were then also assessed by Pearson product moment correlations. These preliminary analyses were followed by a stepwise regression analysis of the prediction of symptomatology level by the Individual, Social

Support, Economic, and Demographic Scales (proportion scores) for the total clinical sample. Subsequently, as post hoc analyses, the correlational and regression analyses were done separately for the single and married (married or ex-spouse contributing) subsamples.

The regression analyses were performed using SPSS REGRESSION - STEPWISE. The stepwise regression technique was employed for these analyses so that the scales were added to the regression equation in the order of their predictive strength. Tabachnick and Fidell (1983) suggest that when using a stepwise regression (SPSS) the significance of  $sr^2$  (the change in the variance explained) be used as the reflection of the importance of each entry into the equation, instead of tests of the regression weights as provided in the computer printout. The significance of  $sr^2$  was calculated according to the formula:

$$F_{inc} = \frac{sr^2}{(1-R^2)/df_{(res)}}$$

This calculation was used to test the significance of each step-wise addition to the regression equation.

#### Hypothesis IV

To determine whether a particular pattern of environmental stressors could be found which could differentiate between subject groups (normal, out-patient, and in-patient), a direct discriminant

function analysis (SPSS DISCRIMINANT) was done using the subscale risk proportion scores of the EDSCQ as the discriminating variables.

#### Economic Risk Hypotheses

##### Hypothesis V

The effect of subject group (clinical versus normal) upon economic risk was examined using a one-way analysis of variance (SPSS ONEWAY). The dependent variable was Economic Risk proportion score and the independent variable was the subject group (clinical, normal). A second analysis of variance comparing all three subject groups (normal, out-patient, and in-patient) on economic risk was also performed using SPSS ONEWAY with a post hoc Scheffe test.

The influence of marital status upon economic risk was examined as a post hoc analysis using an analysis of variance technique (SPSS ANOVA) with subject group and marital status (married or ex-spouse contributing versus single) as the independent variables and Economic Risk proportion score as the dependent variable.

##### Hypothesis VI

To determine whether a group of specific economic variables could differentiate between the subject groups (normal, out-patient, and in-patient) a direct discriminant analysis (SPSS DISCRIMINANT) was done using the 20 economic item scores from the Economic subscale as the discriminating variables.

As a further, post hoc analysis, separate discriminant analyses were performed for the married and single subsamples, using the 20 economic variables for the single sample and the 25 economic and

spouse variables for the married (or economically supported by an ex-spouse) sample.

## CHAPTER FOUR

## RESULTS

General Environmental Risk and Behavioral Cost HypothesesHypothesis I

The analysis of variance of symptomatology (GSI) by patient group demonstrates that the groups, in- and out-patients, are significantly different ( $F(1,643) = 20.774$ ,  $p = .000$ ) with respect to level of symptomatology. An analysis of the group means, further shows that the out-patient group ( $X = 1.40$ ) had a significantly lower level of symptomatology than the in-patient group ( $X = 1.69$ ). The value of ETA for this analysis was found to be .18, therefore 3.24% of the variance in GSI (symptomatology) was explained by patient group.

Hypothesis II

An analysis of variance of Environmental Risk by subject group (normal versus clinical) found that there was a significant difference between the groups ( $F(1,794) = 94.9411$ ,  $p = .000$ ). The clinical group ( $X = .525$ ) scored significantly higher on environmental risk than did the normal group ( $X = .466$ ). When the subject groups were further divided into normal, out-patient, and in-patient groups, the difference between groups was still significant ( $F(2,793) = 59.133$ ,  $p = .0000$ ). The normal group ( $X = .469$ ) had significantly lower environmental risk scores than did the out-patient ( $X = .510$ ) and in-patient groups ( $X = .534$ ). The post hoc Scheffe test indicated that all groups differed significantly from each other at the .01 level.

When the effect of marital status was examined in a post hoc analysis, it was found that both group ( $F(2,790) = 53.736, p = .000$ ) and marital status ( $F(1,790) = 17.447, p = .000$ ) had a significant effect upon environmental risk. For both out-patients and in-patients, the married subjects had significantly lower environmental risk scores than the single subjects ( $p < .01$ , one-tail test), but for the normal sample there was no significant difference in environmental risk between marital status groups.

### Hypothesis III

The bivariate regression of Total Environmental Risk proportion score on symptomatology for the total clinical sample, as shown in Table 2, yielded an  $R^2 = .106, F(1,638) = 75.31, p < .01$ . Thus level of symptomatology (GSI) was significantly predicted by environmental risk.

The results of correlational analysis are found in Table 3. Total Environmental Risk was found to be most highly correlated with symptomatology (GSI raw score) ( $r = .325$ ). Each of the scales of the EDSCQ was also found to be significantly correlated with symptomatology, but the correlations were weaker than that for Total Environmental Risk: the correlations ranged from  $r = .260$  for the Economic scale, to  $r = .111$  for the Individual scale.

With respect to intercorrelations among the EDSCQ scales themselves, the Economic ( $r = .771$ ) and Social Support ( $r = .729$ ) scales strongly correlated with Total Environmental Risk, while the Demographic ( $r = .564$ ) and Individual ( $r = .414$ ) scales demonstrated

Table 2

Bivariate Regression of Total Environmental Risk on Symptomatology  
(Clinical Sample)

| Sample                         | $R^2$ | R    | df      | F      | Beta | Constant |
|--------------------------------|-------|------|---------|--------|------|----------|
| Combined Clinical<br>(N = 640) | .106  | .325 | (1,638) | 75.30* | .325 | -.368    |
| Clinical, married<br>(N = 354) | .074  | .271 | (1,352) | 27.93* | .271 | -.135    |
| Clinical, single<br>(N = 286)  | .134  | .367 | (1,284) | 44.10* | .367 | -.521    |

\*  $p < .01$

Table 3

Correlations for EDSCQ Scales and Symptomatology  
(Total Clinical Sample, N = 640)

| Variables      | GSI   | Eco   | Demo  | Soc   | Ind   | Total |
|----------------|-------|-------|-------|-------|-------|-------|
| Economic       | .260* |       |       |       |       |       |
| Demographic    | .227* | .287* |       |       |       |       |
| Social Support | .210* | .267* | .193* |       |       |       |
| Individual     | .111* | .247* | .186* | .135* |       |       |
| Total Risk     | .325* | .771* | .564* | .729* | .414* |       |
| Means          | 1.583 | .566  | .528  | .569  | .276  | .524  |
| St. dev.       | .789  | .010  | .122  | .099  | .089  | .069  |

\*  $p < .01$



moderate correlations with Total Environmental Risk. The Economic Risk scale correlated to the greatest extent with the other Risk scales (correlations varied from  $r = .287$  with the Demographic Risk scale, to  $r = .247$  with the Individual Risk scale), while the Individual Risk scale showed the weakest correlations with the other scales.

The results of the stepwise regression of the proportion risk scores for the Individual, Social, Economic, and Demographic scales are presented in Table 4. The standardized regression coefficients (Beta), multiple correlation coefficient (R), variance explained ( $R^2$ ), adjusted variance, and the constant for the regression equation, after the entry of all four independent variables (the four risk scales) are given. Each of the first three additions to the regression equation (Economic Risk, Demographic Risk, and Social Risk) significantly added to the prediction of symptomatology; the final addition of Individual Risk did not produce a significant change in the prediction of symptomatology. A significant multiple correlation (R) was found at the end of each step, and after step 4, with all independent variables in the equation,  $R = .331$ ,  $F(4,635) = 19.50$ ,  $p < .01$ .

In post hoc analyses, which separately examined the married and single subsamples, symptomatology was also found to be significantly predicted by Total Environmental Risk: for the married subsample,  $R^2 = .074$ ,  $F(1,352) = 27.93$ ,  $p < .01$ , and for the single subsample,  $R^2 = .134$ ,  $F(1,284) = 44.10$ ,  $p < .01$  (Table 2).

Table 4

Regression of EDSCQ Scales on Symptomatology  
(Total Clinical Sample, N = 640)

| Variable                  | Beta | $sr^2$ | $F_{inc}$ |
|---------------------------|------|--------|-----------|
| Economic Risk Score       | .177 | .067   | 67.00*    |
| Demographic Risk Score    | .147 | .025   | 25.00*    |
| Social Support Risk Score | .131 | .016   | 16.00*    |
| Individual Risk Score     | .023 | .000   | 0.00      |

$$R^2 = .109$$

$$\text{Adjusted } R^2 = .104$$

$$R = .331^*$$

$$\text{constant} = -.357$$

\*  $p < .01$

Correlational data for the clinical, married sample (Table 5) generally was consistent with that found for the sample as a whole. The correlations between symptomatology and the environmental risk indicators show that the strongest associations were between GSI and Total Environmental Risk ( $r = .271$ ) and the Economic Risk scale ( $r = .257$ ). The Social Risk scale ( $r = .111$ ) was found to be most weakly correlated with symptomatology. As with the total sample, the Economic Risk scale correlated most strongly with Total Environmental Risk ( $r = .771$ ) and with the other EDSCQ risk scales (correlations ranged from  $r = .293$  with the Individual scale, to  $.275$  with the Demographic scale). In contrast to the total sample, for the married sample the Social Support Risk scale showed the weakest associations with the other EDSCQ scales, but did show a moderate association with Total Environmental Risk ( $r = .697$ ).

The correlational analysis for the single sample (Table 6) showed some results divergent from those for the total and married samples. For this group, symptomatology again correlated most highly with Total Environmental Risk ( $r = .367$ ), but the correlations with the EDSCQ Risk scales were somewhat different. Symptomatology (GSI) was found to be associated to the greatest extent with the Social Support Risk scale ( $r = .334$ ), followed by Economic Risk ( $r = .245$ ), and Demographic Risk ( $r = .228$ ); no significant correlation was found between GSI and the Individual Risk scale. The Social Support Risk scale also showed the highest correlations with the other EDSCQ Risk scales ( $r = .330$  with Economic Risk,  $r = .272$  with Demographic Risk,

Table 5

Correlations for EDSCQ Scales and Symptomatology  
(Clinical, married subsample, N = 354)

| Variables      | GSI    | Eco    | Demo   | Ind    | Soc    | Total |
|----------------|--------|--------|--------|--------|--------|-------|
| Economic       | .257** |        |        |        |        |       |
| Demographic    | .187** | .275** |        |        |        |       |
| Individual     | .138** | .293** | .210** |        |        |       |
| Social Support | .111** | .291** | .146** | .128*  |        |       |
| Total Risk     | .271** | .771** | .539** | .454** | .697** |       |
| Means          | 1.500  | .559   | .495   | .269   | .569   | .576  |
| St. dev.       | .793   | .101   | .119   | .093   | .098   | .068  |

\*  $p < .05$

\*\*  $p < .01$

Table 6

Correlations for EDSCQ Scales and Symptomatology  
(Clinical, single subsample, N = 286)

| Variable    | GSI    | Soc    | Eco    | Demo   | Ind    | Total |
|-------------|--------|--------|--------|--------|--------|-------|
| Social      | .334** |        |        |        |        |       |
| Economic    | .245** | .330** |        |        |        |       |
| Demographic | .228** | .272** | .274** |        |        |       |
| Individual  | .051   | .146** | .167** | .108   |        |       |
| Total Risk  | .367** | .784** | .768** | .567** | .345** |       |
| Mean        | 1.685  | .570   | .576   | .569   | .285   | .536  |
| St. dev.    | .771   | .101   | .097   | .115   | .084   | .069  |

\*  $p < .05$

\*\*  $p < .01$

and  $r = .146$  with Individual Risk). The Individual Risk scale again showed the weakest correlations with other scales, Total Environmental Risk, and GSI.

Results of the stepwise regression for the married and single subsamples are found in Tables 7 and 8 respectively. These tables include the standardized regression coefficients (Beta), multiple correlation coefficient ( $R$ ), variance explained ( $R^2$ ), adjusted  $R^2$ , and constant, after the entry of all four independent variables. The multiple correlations ( $R$ ) were significantly different from zero at the end of each step. For the married sample after step 4, with all independent variables in the equation  $R = .291$ ,  $F(5,348) = 6.46$ ,  $p < .01$ ; only the initial addition of Economic Risk significantly added to the prediction of symptomatology. For the single subsample, after step 4, with all independent variables in the equation,  $R = .382$ ,  $F(4,281) = 12.02$ ,  $p < .01$ . The stepwise addition of both Social and Economic Risk significantly added to the prediction of symptomatology.

#### Hypothesis IV

The results of direct discriminant analysis of the sample groups (normal, out-patient, in-patient), using the subscale proportion scores of the EDSCQ as the discriminating variables, are displayed in Table 9. The value of the first discriminant function, which discriminated in-patients from out-patients and normals, at the group mean was .370 for the in-patients, -.157 for the out-patients, and -.732 for the normals. For the second function, which discriminated out-patients from normals, the discriminant function coefficient

Table 7

Regression of EDSCQ Risk Scales on Symptomatology  
(Clinical, married sample, N = 354)

| Variable       | Beta  | $sr^2$ | $F_{inc}$ |
|----------------|-------|--------|-----------|
| Economic       | .265  | .066   | 22.00*    |
| Demographic    | .147  | .014   | 4.67      |
| Individual     | .070  | .002   | 0.67      |
| Social Support | -.010 | .002   | 0.67      |

$$R^2 = .085$$

$$\text{Adjusted } R^2 = .072$$

$$R = .291*$$

$$\text{constant} = -.742$$

\*  $p < .01$

Table 8

Regression of EDSCQ Scales on Symptomatology  
(Clinical, single subsample, N = 286)

| Variable       | Beta  | $sr^2$ | $F_{inc}$ |
|----------------|-------|--------|-----------|
| Social Support | .261  | .112   | 37.30*    |
| Economic       | .129  | .021   | 7.00*     |
| Demographic    | .124  | .013   | 4.33*     |
| Individual     | -.021 | .000   | 0.00      |

$$R^2 = .146$$

$$\text{Adjusted } R^2 = .133$$

$$R = .382*$$

$$\text{constant} = -.461$$

\*  $p < .01$



Table 9

Discriminant Function Analysis of Sample Groups by EDSCQ Subscales  
(N = 791)

| Standardized Canonical Discriminant<br>Function Coefficients | Function 1 | Function 2 |
|--------------------------------------------------------------|------------|------------|
| Individual Risk                                              | .019       | .281       |
| Social Risk                                                  | .159       | .704       |
| Economic Risk                                                | .832       | -.686      |
| Demographic Risk                                             | .274       | .513       |
| Summary Data                                                 |            |            |
| Eigen value                                                  | .179       | .020       |
| Percent of Variance                                          | 89.97      | 10.03      |
| Wilkes Lambda                                                | .832       | .980       |

values were .205 for the out-patients,  $-.159$  for the normals, and  $-.065$  for the in-patients. The Economic Risk variable was found to be the strongest discriminating variable in the first function, with a coefficient of .832, but in the second function, Social (.704), Economic ( $-.686$ ), and Demographic Risk (.513) were all found to be important discriminators. Overall, 53.98% of cases were correctly classified by the discriminant function using the risk scales of the EDSCQ: 65.3% of normals, 36.8% of out-patients, and 60.2% of in-patients were correctly classified.

#### Economic Risk Hypotheses

##### Hypothesis V

An analysis of variance of Economic Risk by subject group (normal versus clinical) found that there was a significant difference between the groups ( $F(1,794) = 73.376$ ,  $p = .0000$ ). The clinical group ( $X = .567$ ) scored significantly higher on economic risk than did the normal group ( $X = .492$ ). When the subject groups were further divided into normal, out-patient, and in-patient groups, the difference between groups was still significant ( $F(2,793) = 64.254$ ,  $p = .0000$ ). The in-patient ( $X = .587$ ) and out-patient ( $X = .533$ ) groups had significantly higher economic risk scores than the normal group ( $X = .492$ ). The post hoc Scheffe test indicated that all groups differed significantly from each other at the .01 level.

When the effect of marital status (i.e., the economic contribution of a spouse or ex-spouse versus single) was examined in a post hoc analysis, both groups (normal, out-patient, in-patient)

( $F(2,790) = 62.403$ ,  $p = .000$ ) and marital status ( $F(1,790) = 5.747$ ,  $p = .017$ ) were found to significantly affect Economic Risk. Married out-patients had significantly lower Economic Risk scores than single out-patients ( $p < .05$ , one-tail test), but for the normal and in-patient samples, there was no significant difference in economic risk with respect to marital status.

#### Hypothesis VI

The discriminant analysis of the subject groups (normal, out-patient, in-patient), by the economic variables of the Economic Risk scale, is shown in Table 10 for the 667 cases with complete data for all economic variables. The value of the first discriminant function, at the group means, was .493 for the in-patients, -.255 for the out-patients, and -.935 for the normals; this function discriminated the in-patients from the out-patients and normals. For the second function, the discriminant function values, at the group means, were .400 for the out-patients, -.098 for the in-patients, and -.277 for the normals; this function differentiated the out-patients from the normals. Overall, 58.1% of cases were correctly classified; 76.8% of normals, 42.8% of out-patients, and 59% of in-patients.

In examining the discriminant function correlation coefficients for the economic variables, certain aspects of the economic environment appear to be of importance to the differentiation between normal, out-patient, and in-patient groups. With respect to the first function (in-patients versus out-patients and normals) variables V40, V31, V39, and V45 were of most importance in the discrimination.

Table 10

Discriminant Function Analysis of Sample Groups by Economic Variables  
(Total Sample, N = 667)

-----  
 Standardized Canonical Discriminant  
 Function Coefficients

| Economic V. Item Content |                                       | Function 1 | Function 2 |
|--------------------------|---------------------------------------|------------|------------|
|                          |                                       | -----      |            |
| V31                      | Occupational level                    | .381       | -.251      |
| V32                      | Occupational level of Father          | -.018      | .073       |
| V33                      | Occupational level of Mother          | -.037      | -.302      |
| V34                      | Employment status                     | .065       | -.125      |
| V35                      | Length of employment status           | .125       | .125       |
| V36                      | Employment status of Father           | .023       | .055       |
| V37                      | Employment status of Mother           | -.011      | .014       |
| V38                      | Annual Income                         | -.029      | .188       |
| V39                      | Family annual income                  | .309       | -.265      |
| V40                      | Source of income                      | .382       | -.045      |
| V41                      | Father's highest annual income        | .074       | -.089      |
| V42                      | Mother's highest annual income        | -.087      | .129       |
| V43                      | No. economically contributing members | -.032      | -.198      |
| V44                      | no. of financial dependents           | .108       | .593       |
| V45                      | Economic mobility                     | .301       | .161       |
| V46                      | Economic mobility of Father           | .095       | .012       |
| V47                      | Economic mobility of Mother           | .010       | -.032      |
| V48                      | Economic satisfaction                 | .086       | .447       |
| V49                      | Home ownership                        | -.013      | .063       |
| V50                      | Value of home or rent                 | -.098      | -.386      |
| -----                    |                                       |            |            |
| Summary Data             |                                       |            |            |
| Eigen value              |                                       | .325       | .064       |
| Percent of Variance      |                                       | 83.54      | 16.46      |
| Wilkes Lambda            |                                       | .709       | .940       |
| -----                    |                                       |            |            |

Source of income, occupational level, family total income, and economic mobility differentially identified in-patients as at greater environmental risk. In the second function, the variables of importance (discriminating out-patients from normals) included: V44, V48, V50, V33 and V39. It would appear that out-patients are at particularly greater environmental risk than normals, with respect to the number of financial dependents and economic satisfaction (positive correlation coefficients) but less at risk with respect to value of home or rent, occupational level of mother, and total family income (negative correlation coefficients).

Post hoc investigation of the single and married subsamples separately revealed that a discriminating function could only be found for the married subsample (Table 11). For that subsample (N = 363), again the first function, with values of .693 for the in-patients, -.981 for the normals, and -.551 for the out-patients, discriminated in-patients from normals and out-patients; the values at the group means were .490 for the out-patients, -.446 for the normals and -.065 for the in-patients. Based upon these discriminant functions, 63.8% of the married subsample was correctly classified; 73.4% of normals, 66.5% of in-patients, and 51.0% of out-patients.

Certain economic variables appear to be more important in differentiating between the sample groups. The economic variables which were of particular importance in the first function (discriminating between married in-patients from married out-patients and normals) were: V39, V78, V79, V40, and V31. These variables

Table 11

Discriminant Function Analysis of Sample Groups by Economic Variables  
(Married subsample)

-----  
 Standardized Canonical Discriminant  
 Function Coefficients

| Economic V.  | Item Content                          | Function 1 | Function 2 |
|--------------|---------------------------------------|------------|------------|
| -----        |                                       |            |            |
| V31          | Occupational level                    | .303       | -.161      |
| V32          | Occupational level of Father          | .047       | -.029      |
| V33          | Occupational level of Mother          | .015       | -.030      |
| V34          | Employment status                     | .038       | .087       |
| V35          | Length of employment status           | .273       | .027       |
| V36          | Employment status of Father           | -.007      | .081       |
| V37          | Employment status of Mother           | -.085      | -.255      |
| V38          | Annual Income                         | -.241      | .261       |
| V39          | Family annual income                  | .519       | -.278      |
| V40          | Source of income                      | .400       | .007       |
| V41          | Father's highest annual income        | -.105      | .073       |
| V42          | Mother's highest annual income        | -.071      | .134       |
| V43          | No. economically contributing members | -.086      | -.392      |
| V44          | no. of financial dependents           | .080       | .587       |
| V45          | Economic mobility                     | .148       | .460       |
| V46          | Economic mobility of Father           | .078       | -.110      |
| V47          | Economic mobility of Mother           | .030       | -.271      |
| V48          | Economic satisfaction                 | -.065      | .222       |
| V49          | Home ownership                        | -.002      | .265       |
| V50          | Value of home or rent                 | -.124      | -.294      |
| V75          | Spouse occupational level             | -.106      | .107       |
| V76          | Spouse employment status              | -.282      | .269       |
| V77          | Length of spouse employment status    | -.158      | -.068      |
| V78          | Spouse economic mobility              | .455       | -.305      |
| V79          | Spouse annual income                  | .429       | .101       |
| -----        |                                       |            |            |
| Summary Data |                                       |            |            |
|              | Eigen value                           | .543       | .111       |
|              | Percent of Variance                   | 83.04%     | 16.96%     |
|              | Wilkes Lambda                         | .583       | .900       |
| -----        |                                       |            |            |

represent total family income, economic mobility of spouse, spouse's income, source of income and occupational level; for each of these variables in-patients were more at risk than out-patients or normals. Some of the economic variables of particular importance in differentiating between the married normal and married out-patient groups (Function 2) were variables 44, 45, 43, 78, 50, 47, and 76, reflecting data on number of financial dependents, economic mobility, number of contributing members, spouse economic mobility, value of home or rent, mother's economic mobility, and spouse's employment status. Out-patients were at greater risk for the number of financial dependents, economic mobility, and spouse's employment status than normals, but at less risk with respect to number of contributing family members, spouse's economic mobility, value of accommodation, and mother's economic mobility.

## CHAPTER FIVE

## DISCUSSION

The primary aim of this study was to investigate the relationship between environmental and economic risk and behavioral cost. A secondary aim was to examine the usefulness of the assessment of environmental risk at the individual level using the Economic, Demographic, and Social Characteristics Questionnaire (EDSCQ). The results of the study generally support both the contention of a direct relationship between environmental risk and behavioral cost, as well as the usefulness of the EDSCQ.

Hypothesis I tested the difference in level of symptomatology as measured by the SCL-90/BSI between the clinical groups. The analysis of variance statistically confirmed that the in-patient sample had a higher level of symptomatology than out-patients. This implies that the level of symptomatology leads to differences in level of care, but some caution is warranted in interpreting the symptomatology with group association. The ETA value of .18 found for the analysis of variance suggests that only 3.24% of the variance in symptomatology is explained by patient group. This limited amount of explained variance raises questions both with respect to the symptomatology measure (the SCL-90 and BSI) and the true degree of difference in symptomatology between the patient groups. If the out-patient and in-patient groups truly differ with respect to level of objective distress, one would have expected a greater proportion of variance to be explained by the groups. Consequently, the ability of the SCL-90/BSI to differentiate between levels of symptomatology would seem to be in question.



Alternatively, the results may be indicative of the factors other than degree of psychological distress, which can play a role in determining the mode of treatment to which an individual is admitted. As discussed earlier in this paper, admission can also be dependent upon a variety of other variables: admission and diagnostic criteria for the institution; availability of space; support resources available in the community; socio-economic status; and previous treatment (Allen & Britt, 1983; Dooley & Catalano, 1986; Goldstein, 1979). Although it is possible that there is little difference in degree of psychological distress between out-patients and in-patients, it seems relatively unlikely that non-distress or non-symptomatology factors alone can account for the remainder of the difference between clinical groups. Some caution and further investigation with respect to utilization of the SCL-90/BSI scales as the sole measure of symptomatology would seem advisable.

The behavioral cost consequences of environmental stress, as proposed by the environmental stress hypothesis and the economic psychology model, were the concern of the remainder of the hypotheses. All of the analyses undertaken did provide support for the environmental stress hypothesis: those in the clinical samples experienced higher levels of general environmental risk and economic risk as compared to the normal sample and further, within the clinical groups, environmental risk variables were predictive of level of symptomatology.

Support for both the environmental risk hypothesis in general and for the individual level of analysis of the economic psychology model was provided by the results of the total environmental risk and economic risk hypotheses . The results for the general environmental risk hypotheses provided evidence of a positive association between environmental risk and symptomatology, where increased symptomatology (as reflected by the different levels of treatment and by Global Symptom Index) was both associated with, and predicted by, environmental risk. The parallel and consistent findings for the economic risk scale of the EDSCQ gave further support for the environmental risk hypothesis.

The analyses of results of Hypothesis II and Hypothesis V, confirmed that subjects in the in-patient and out-patient groups had significantly higher general environmental and economic risk scores than those in the normal group. These findings are in accord with the environmental risk hypothesis of Dohrenwend and Dohrenwend (1969), the concept of behavioral cost (Catalano & Dooley, 1981), and are also consistent with the individual level of analysis of the economic psychology model of MacFadyen and MacFadyen. Those receiving treatment for mental distress had experienced a greater degree of environmental stress than had those individuals in the normal sample.

Further support for the environmental risk hypothesis also came from the analyses of the regression equations for EDSCQ Total Risk score and subscale scores. Symptomatology was significantly predicted both by Total Environmental risk and also by the multiple regression

of the component Economic, Social, and Demographic risk scales. These findings suggest that several dimensions of environmental variables do significantly influence symptomatology.

Of particular interest are the findings concerning the economic risk hypotheses (Hypothesis V and Hypothesis VI). The results of previous research into the effects of economic variables have been limited in their applicability by several methodological short-comings. The examination of single economic variables, use of questionable measures of behavioral cost which were difficult to compare between studies (e.g., interview data, single dimension scales, and service admission data) and the use of single sample populations have all limited the generalizability of individual level studies (Dooley & Catalano, 1986). As a result of limitations such as these and others, as noted previously in this paper, the measured effects of economic variables on distress have been inconsistent and widely varied in effect strength (Dooley & Catalano, 1986). The present study attempted to address some of these limitations through the use of the EDSCQ to examine a variety of economic variables (in a quantifiable form), the use of a general symptomatology measure which tapped a variety of symptom dimensions, and the sampling of a variety of populations (normal, out-patient and in-patient).

Perhaps as a result of these improvements in design, the present study did find significant results concerning the effect of the individual level economic environment on psychological distress. Hypothesis V found that the economic risk score was significantly

different between normal, and clinical groups and more specifically that economic risk increased moving from normal, to out-patient, and finally to the in-patient group, which was at the greatest environmental risk due to economic variables.

The importance of economic risk factors was further evident from the regression analysis (Hypothesis III) of the EDSCQ risk subscales and the discriminant analyses of Hypotheses IV and VI. The regression analysis found that economic risk was strongly correlated with symptomatology and was a significant predictor of symptomatology for the clinical sample. Economic risk was indicated as an important discriminating factor between sample groups, both as a total scale (Hypothesis IV) and as a collection of economic items (Hypothesis VI), which were able to differentiate between sample groups. Although the overall classification of subjects using both the EDSCQ subscales (54.98%) and the economic items (58.1%) was not particularly noteworthy, it is surprising that environmental variables alone (excluding any consideration of level of symptomatology) could classify individuals at better than chance rate. All of these analyses strongly suggest the importance of the consideration of economic variables, and environmental variables in general, in assessment of psychological disorder.

The differential importance of specific items of the economic risk scale was also suggested in the results of the discriminant analysis using the Economic Scale items (Hypothesis VI). Eight different economic variables were identified as particularly good

predictors of group placement: source of income, occupational level, family income, economic mobility, number of financial dependents, economic satisfaction, value of accommodation, and occupational level of mother. Both the direction of risk (in general), and the specific economic variables identified as important, were generally consistent with previous research and with the environmental risk hypothesis.

In-patients were found to be at greater environmental risk than out-patients and normals with respect to source of income, occupational level, family income, and economic mobility. The first three of these variables would seem to reflect lower socio-economic status for in-patients, a result consistent with previously noted negative association between socio-economic status and distress (Hollingshead & Redlichy, 1953; Bebbington, Hurry, Tennant, Sturt, & Way, 1981; Crist, McGuiness, & Harris, 1978; Dilling & Wayerer, 1984). Economic mobility as a discriminating variable, suggests that in-patients are differentially more at risk due to lack of advancement, demotion or job loss. While the present study can not answer the question of direction of causation, it does provide further evidence of the association between economic variables and symptomatology. These variables, which had previously been identified singly in limited sample studies as having implications for mental health, were confirmed as being important environmental risk variables in the present study.

The economic variables discriminating between out-patients and normals did not produce as consistent a pattern of risk. The

direction of risk concerning number of financial dependents and economic satisfaction was consistent with the general trend of increasing risk being associated with increased distress (i.e., out-patients at more risk than normals) but the opposite direction risk for value of accommodation, occupational level of mother, and family income (i.e., out-patients at less risk than normals) is more difficult to understand within the environmental stress hypothesis. It would seem that at the more extreme levels of symptomatology, the effects of environmental risk are more clearly evident, whereas the environmental risk differences between normals and out-patients are more subtle.

Although socio-demographic variables were not the focus of this study, several differences between the normal and clinical samples were observed. It is interesting to note that most of the differences between the normal and clinical samples, are consistent with prior epidemiological findings and consistent with the economic psychology model and the environmental risk hypothesis.

A few of the observed socio-demographic differences between the clinical and normal samples were quite marked. Those concerning gender, age, and education were noteworthy, whereas the difference in marital status was only suggestive of a risk differential between groups. While the normal sample was approximately equally split between males and females, the majority of the clinical sample subjects were females, a finding consistent with much of the epidemiological research, which has generally observed a higher

incidence of disorder among females (Goldstein, 1979; Halldin, 1985; Jenkins, 1985). With respect to age, the normal sample, with a mean age of 39.0 years, was significantly older ( $p < .01$ ) than the clinical samples (out-patient mean age of 32.7 years; in-patient mean age of 35.2 years), a finding which is consistent with researchers, such as D'Arcy (1982), Leaf, Weissman, Myers, Tischler, and Holzer (1984), and Noll and Dubinsky (1985). They have contended that it is young adults (aged 25 - 34 years) with their higher incidence of psychiatric disorder, who are most at risk. With respect to level of education, 40% of the normal sample had completed university, whereas for the clinical samples, the most common level of completed education was high school. This difference is consistent with Thoits (1982), who observed that those with higher education enjoy lower levels of distress. Lower levels of education are often also associated with lower status occupations and lower socio-economic status, two economic variables frequently associated with increased levels of distress (e.g., Bachrach & Zautra, 1980; Bebbington et al., 1981; Halldin, 1985; Hollingshead and Redlich, 1953; Salokangas, 1978; Thoits, 1982).

Any clear difference between the normal and clinical samples with respect to marital status, as measured by the Individual Scale, was not as clear. Although a slightly greater proportion of those in the out-patient sample would appear to be in the higher marital risk groups (particularly those separated less than two years) as compared to the normal and in-patient samples, the overall proportion of the sample in the higher risk categories was still relatively low. For

all groups (normal, out-patient and in-patient) the most common status was married or single, both of which are considered to be relatively low risk. While for some of the out-patient sample, especially those separated less than two years, marital status may have contributed to their symptomatology and subsequent help-seeking, a clear overall difference in risk level between the clinical and normal groups is not evident from the results.

Post hoc analyses further explored the economic implications of marital status. Those presently married or receiving some economic contribution from an ex-spouse, were found to be at significantly less total environmental risk than single subjects. This suggests that marriage, with both its social and economic implications, may moderate total environmental risk; a conclusion consistent with other studies (D'Arcy, 1982; Dilling & Weyerer, 1984; Schindelka, 1986), which also found lower levels of symptomatology for those married. When only economic risk was examined, a significant benefit from marriage was found only for the out-patient group; for in-patients the social support aspect of marriage may be more important than the economic component. This finding further points to the importance of accounting for a variety of risks and benefits, social and economic, when attempting to assess the impact of marital status upon the environmental risk.

The post hoc discriminant analysis for the married and single subsamples identified three additional economic items from the spouse scale, as potentially important economic variables. Spouse income,



spouse economic mobility, and spouse employment status were all shown to be discriminating variables. Once again the results differentiating the in-patient group from out-patients and normals were more clearly in the anticipated direction: in-patients were more at risk with respect to spousal income and spouse economic mobility than out-patients and normals. The second discriminant function showed that although out-patients were more at risk from spouse's employment status than normals, they were less at risk with respect to spouse's economic mobility. Although the results seem confusing, they do suggest at least that it is important to consider the economic circumstances of the spouse when assessing the environmental risk level of a married individual.

In general, the results of this study provide additional support for the validity of the Economic, Demographic and Social Characteristics Questionnaire. Environmental risk significantly differed between normals, out-patients and in-patients in the anticipated direction with those experiencing the greatest degree of behavioral cost (as reflected by their admission to hospital) also identified as having experienced the greatest degree of environmental risk.

Symptomatology, as reflected by the Global Symptom Index (GSI) was found to correlate significantly with EDSCQ Total Environmental Risk and with the EDSCQ subscales. The prediction of symptomatology by Total Environmental Risk and by EDSCQ subscales also suggests that a behavioral cost is associated with environmental risk.

Symptomatology was significantly predicted by Total Environmental Risk and by several of the subscales of the EDSCQ.

Examination of the correlations between Total Environmental Risk and the EDSCQ subscales show that although each subscale correlated moderately to highly with total environmental risk, there is also an element of subscale uniqueness. Thus while the subscales would seem, to some extent, to be tapping a common universe of environmental variables, each also contributes additional information from other dimensions.

Several drawbacks are apparent in the design of this study. Limitations with respect to the population samples are evident, particularly concerning data collection for the normal sample, but also for the clinical samples. Additional difficulties related to the dependent variable measure of behavioral cost appeared when the data analysis was initiated.

A major difficulty with respect to this study was that it was not possible to get data with respect to level of symptomatology or treatment data for the normal sample. Therefore, it is possible that some of the normal sample were actually experiencing some level of symptomatology and receiving some form of treatment. In addition, because the normal sample data was collected by voluntary mailing, it is possible that selection bias occurred such that those who were experiencing some degree of environmental risk were more likely to return the questionnaire. The Total Risk data for the normal sample is somewhat reassuring with respect to a potential bias toward higher

risk respondents. The mean Total Risk raw score for the group was 260.1, and the Total Risk proportion score was .466, suggesting that on average the normal sample was at low environmental risk. The inclusion of a symptomatology screening device, in future studies, would control for this potential difficulty and also allow for the examination of the full range of effects of environmental risk on symptomatology.

Although the inclusion of several sample populations in this study was an improvement over many previous studies in the area, there were still limitations with respect to the clinical sample. As with many other studies, data for the samples was collected only from a single type of institution. The in-patient sample came only from Hospital A, while the out-patient sample came primarily from Hospital B with approximately one quarter of the sample from Hospital A. As both samples came from inner-city hospitals, there are limitations with respect to the generalizability of the data. The sampling from a greater range of service providers would have broadened the range of environmental risk and behavioral cost sampled and thus improved the generalizability of the results.

As with many other studies which have addressed environmental variables, there are problems with respect to the measurement of symptomatology. As discussed earlier, the SCL-90 and BSI as symptomatology indicators may be suspect and require further investigation. An alternative behavioral cost indicator which is time

limited yet reliable and valid for use with a variety of sample populations has not been identified at this time.

This thesis has presented evidence supporting both the environmental stress hypothesis and the individual level of analysis of the economic psychology model. Environmental stress, in general, and economic stress, in particular, as measured by the EDSCQ, were found to be associated with behavioral cost, as measured by level of treatment, and predictive of self reported symptomatology. Evidence supporting the relevance of specific, individual level, economic events as environmental risk variables was also presented. In addition, the analysis of environmental risk provided further evidence of the usefulness and validity of the EDSCQ as a comprehensive measure of environmental risk.

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## APPENDIX I

## Economic, Demographic and Social Characteristics

## Questionnaire (EDSCQ)\*

## ADULT FORM (Age 18 or over)

INSTRUCTIONS: Please answer ALL questions. For some questions, FILL IN THE BLANK. For other questions, where there is more than (1) choice, CIRCLE THE CORRECT ANSWER. REMEMBER, ALL QUESTIONS MUST BE ANSWERED. If you do not know the exact answer, please make the closest estimate.

Section 1: PERSONAL DATA FOR CLIENTS.

- 1.010 What is the nature of the problem for which you are seeking help? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 1.020 Is this your:  
1) First admission for this service; 2) Second admission for this service; 3) Third admission or more.
- 1.030 Who referred you to this service?  
1) Self; 4) Family physician;  
2) Friends; 5) Another agency;  
3) Family; 6) Emergency.
- 1.040 How long has your problem existed?  
1) 1 month or less; 5) 18-23 months;  
2) 2-5 months; 6) 2-3 years;  
3) 6-11 months; 7) 4 years or more.  
4) 12-17 months.

\*(MacFadyen & MacFadyen, Copyright 1984)

- 1.050 How would you rate the severity of your problem?  
1) Mild; 3) Severe;  
2) Moderate; 4) Critical.
- 1.060 How would you rate your interest in receiving help?  
1) High; 3) Low;  
2) Moderate; 4) No interest.
- 1.070 Your place of residence is: (e.g., Calgary, Olds, Farm near  
Edmonton) \_\_\_\_\_
- 1.080 Your postal code is: \_\_\_\_\_
- 1.090 Your age is: \_\_\_\_\_
- 1.100 Your sex is:  
1) Male; 2) Female.
- 1.110 Are you the main wage-earner in the household?  
1) Yes 2) No.

Section 2: INDIVIDUAL DATA FOR CLIENTS.

- 2.120 What is your religious affiliation? (1) Protestant;  
(2) Catholic; (3) Jewish; (4) Moslem; (5) Hindu;  
(6) Other (Please Specify): \_\_\_\_\_;  
(7) None.
- 2.130 What is your ethnic origin? (1) Caucasian; (2) Oriental;  
(3) East Indian; (4) Arab; (5) Metis; (6) Negro;  
(7) Treaty Indian; (8) Non-treaty Indian; (9) Eskimo;  
(10) Other (Please Specify): \_\_\_\_\_.
- 2.140 What is your citizenship? (1) Canada; (2) United States;  
(3) United Kingdom; (4) Australia/New Zealand;  
(5) Europe; (6) Asia; (7) Latin America; (8) Middle  
East; (9) Africa; (10) Other (Please Specify):  
\_\_\_\_\_.

- 2.150 What is your native language? (1) English; (2) French; (3) Ukrainian; (4) Other European; (5) Other (Please Specify): \_\_\_\_\_.
- 2.160 What language is/was spoken at home? (1) English; (2) French; (3) Ukrainian; (4) Other European; (5) Other (Please Specify): \_\_\_\_\_.
- 2.170 What is the highest level of education you have completed? (1) University; (2) Technical School, Business School; (3) Apprenticed Trade (learned trade on the job); (4) Secondary School; (5) Elementary School; (6) Less than Grade 6.
- 2.180 What is your marital status? (1) Married; (2) Single; (3) Widowed (for over 2 years); (4) Divorced (for over 2 years); (5) Separated (for over 2 years); (6) Recently widowed (within the last 2 years); (7) Recently divorced (within the last 2 years); (8) Recently separated (within the last 2 years); (9) Common law.

Section 3: SOCIAL/FAMILY DATA FOR CLIENT.

- 3.190 If single, what other persons live with you? (1) Friend(s)/Roomate(s); (2) Both parents and other member(s) of your family; (3) Both parents; (4) Single parent; (5) Single parent and other member(s) of your family; (6) Other member(s) of your family; (7) Foster parent(s)/Gaurdian(s) and other member(s) of your family; (8) Foster-parent(s)/Guardian(s); (9) Dependent child(ren) only; (10) Alone; (11) Residential placement; (0) Other (Please Specify): \_\_\_\_\_.

- 3.192 If married, or living common law, what other persons live with you? (1) spouse; (2) spouse and children; (3) spouse, children and parents; (4) spouse, children and in-laws; (5) spouse and parents; (6) spouse and in-laws; (0) Other (Please Specify): \_\_\_\_\_.
- 3.193 If widowed, divorced or separated, what persons live with you? (1) Friend(s)/Roomate(s); (2) Your child(ren); (3) Your parent(s); (4) Your in-law(s) or other relatives; (5) Your child(ren) and parent(s); (6) Your children and in-law(s) or other relatives; (7) Your child(ren) and non-relatives; (8) Alone; (9) Residential/Group Placement; (10) Other (please Specify): \_\_\_\_\_.
- 3.200 What is your father's marital status? (1) Married; (2) Widowed (for over two years); (3) Divorced (for over two years); (4) Separated (for over two years); (5) Single; (6) Recently widowed (within last two years); (7) Recently divorced (within last two years); (8) Recently Separated (within last two years); (9) Common law; (10) Father not living.
- 3.210 What is your mother's marital status? (1) Married; (2) Widowed (for over two years); (3) Divorced (for over two years); (4) Separated (for over two years); (5) Single; (6) Recently widowed (within last two years); (7) Recently divorced (within last two years); (8) Recently Separated (within last two years); (9) Common law; (10) Mother not living.

- 3.220 What is the highest level of education completed by your father? (1) University; (2) Technical School, Business School; (3) Apprenticed Trade (learned trade on the job); (4) Secondary School; (5) Elementary School; (6) Less than Grade 6.
- 3.230 What is the highest level of education completed by your mother? (1) University; (2) Technical School, Business School; (3) Apprenticed Trade (learned trade on the job); (4) Secondary School; (5) Elementary School; (6) Less than Grade 6.
- 3.240 My parents are/were: (1) Two Parents/natural; (2) Two Parents/Step-father; (3) Two Parents/Step-mother; (4) Two Parents/Common-Law Father; (5) Two Parents/Common-Law Mother; (6) Single Parent/Mother; (7) Single Parent/Father; (8) Two adoptive parents; (9) Single Adoptive Parent (mother); (10) Single Adoptive Parent (father); (11) Two Foster Parents; (12) One Foster Parent; (13) No care from natural parents, adoptive parents or foster parents. (0) Other (Please specify)  
\_\_\_\_\_.
- 3.250 How many dependent children do you have? (1) None; (2) One; (3) Two; (4) Three; (5) Four or more.
- 3.260 How many of your brother(s)/sister(s) are living? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None or only child.
- 3.270 How many of your brother(s)/sister(s) live near enough to visit? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None or only child.

- 3.280 How many families of close relatives are living? (1) Four or more families; (2) Three families; (3) Two families; (4) One family; (5) None. (Where "family" refers to a relative or relatives sharing a single dwelling.)
- 3.290 How many families of close relatives live near enough to visit? (1) Four or more families; (2) Three families; (3) Two families; (4) One family; (5) None. (Where "family" refers to a relative or relatives sharing a single dwelling.)
- 3.300 How many social contacts per week do you have with relatives? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.
- 3.310 How many of your close friends do you have now? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.
- 3.320 How many close friends live near enough to visit? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.
- 3.330 How many social contacts per week do you have with close friends? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.
- 3.340 How many visits are made to you per week by relatives, friends, or acquaintances? (1) Seven or more; (2) Six; (3) Five; (4) Four; (5) Three; (6) Two; (7) One; (8) None.
- 3.350 How many visits are made by you per week to relatives, friends or acquaintances? (1) Seven or more; (2) Six; (3) Five; (4) Four; (5) Three; (6) Two; (7) One; (8) None.
- 3.360 How many clubs/organizations do you belong to? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.



- 3.370 How many offices do you hold in clubs or organizations?  
(1) Four or more; (2) Three; (3) Two; (4) One;  
(5) None.
- 3.380 If you needed urgent help whom would you contact?  
(1) Relative living nearby; (2) Relative within the  
province; (3) Relative outside the province; (4) Close  
friend; (5) Friend; (6) Neighbour; (7) Acquaintance;  
(8) Other person or agency (please specify) \_\_\_\_\_.

Section 4. ECONOMIC DATA FOR CLIENT.

- 4.390 What would your occupational level be if you were to apply  
for a job now? (1) Professional; (2) Manager, official  
or proprietor; (3) Clerical, sales, secretarial;  
(4) Craftsman, foreman, skilled worker, independent farmer;  
(5) Operative or trade worker; (6) Service worker,  
including private household (e.g., cleaner; waiter/waitress);  
(7) Labourer, unskilled worker.
- 4.400 What is/was the highest occupational level your father could  
apply for? (Please answer even if your father never worked  
or is no longer living). (1) Professional; (2) Manager,  
official, or proprietor; (3) Clerical, sales, secretarial;  
(4) Craftsman, foreman, skilled worker; independent farmer;  
(5) Operative or trade worker; (6) Service worker,  
including private household (e.g., cleaner; waiter); (7)  
Labourer, unskilled worker.

- 4.410 What is/was the highest occupational level your mother could apply for? (Please answer even if your mother is no longer living). (1) Professional; (2) Manager, official, or proprietor; (3) Clerical, sales, secretarial; (4) Craftsman, foreman, skilled worker, independent farmer; (5) Operative or trade worker; (6) Service worker, including private household (e.g., cleaner; waitress); (7) Labourer, unskilled worker.
- 4.420 What is your employment status? (1) unemployed by choice (e.g., student, homemaker); (2) full-time employment; (3) part-time employment by choice; (4) retired; (5) part-time employment, but would like full time work; (6) unemployed and want employment.
- 4.430 If you are employed, how long have you been in your present job? (0) N/A (e.g., not employed, retired); (1) 5 years or more; (2) 3-4 years; (3) 1-2 years; (4) 6-11 months; (5) 5 months or under.
- 4.431 If you are working, how many hours do you work per week? (0) N/A (e.g., student; not working); (1) 40 hours or more; (2) 30-39 hours; (3) 20-29 hours; (4) 10-19 hours; (5) 9 hours or under.
- 4.432 If you are working, what is your hourly wage? (0) N/A (e.g., student; not working); (1) \$30 or more; (2) \$25-29; (3) \$20-24; (4) \$15-19; (5) \$10-14; (6) \$5-9; (7) \$4 or less.

- 4.433 If you are unemployed how long have you been unemployed?  
(0) N/A (e.g., employed); (1) do not want employment; (2) one month or less; (3) 2-5 months; (4) 6-11 months; (5) 12-17 months; (6) 18-23 months; (7) 2-3 years; (8) 4 years or more.
- 4.440 What is/was the most recent employment status of your father?  
(1) unemployed by choice (e.g., student, house-husband);  
(2) full-time employment; (3) part-time employment by choice; (4) retired; (5) part-time employment, but would like full-time; (6) unemployed and want employment.
- 4.450 What is/was the most recent employment status of your mother?  
(1) unemployed by choice (e.g., student, homemaker); (2) full-time employment; (3) part-time employment by choice; (4) retired; (5) part-time employment, but would like full-time; (6) unemployed and want employment.
- 4.460 What is your present annual income? (1) \$50,000 or more; (2) \$40,000-49,999; (3) \$30,000-39,999; (4) \$20,000-29,999; (5) \$10,000-19,999; (6) \$9,999 or less.
- 4.470 What is the present annual family income used for the purpose of you and your family? (1) \$50,000 or more; (2) \$40,000-49,999; (3) \$30,000-39,999; (4) \$20,000-29,999; (5) \$10,000-19,999; (6) \$9,999 or less.
- 4.480 What is the primary source of your present income?  
(1) Investment (rental income); (2) Student assistance; (3) Employment Income; (4) Pension; (5) Workman's compensation; (6) Alimony; (7) Unemployment insurance; (8) Government Social Allowance; (9) Other (Please Specify):  
\_\_\_\_\_

- 4.490 What is/was your father's highest annual income?  
(1) \$50,000 or more; (2) \$40,000-49,999; (3) \$30,000-39,999; (4) \$20,000-29,999; (5) \$10,000-19,999;  
(6) \$9,999 or less.
- 4.500 What is/was your mother's highest annual income?  
(1) \$50,000 or more; (2) \$40,000-49,999; (3) \$30,000-39,999; (4) \$20,000-29,999; (5) \$10,000-19,999;  
(6) \$9,999 or less.
- 4.510 How many people contribute to your household's financial support (including yourself)? (1) Four or more; (2) Three; (3) Two; (4) One; (5) None.
- 4.520 How many people are financially dependent on you (in addition to yourself)? (1) None; (2) One; (3) Two; (4) Three; (5) Four or more.
- 4.530 What is/was your economic mobility? (1) promotion since employed; (2) same job level since employed; (3) demoted (lower level of employment) since employed; (4) quit job; (5) never employed; (6) fired, laid off.
- 4.540 What is/was the economic mobility of your father? (1) promotion since employed; (2) same job level since employed; (3) demoted (lower level of employment) since employed; (4) quit job; (5) never employed; (6) fired, laid off.
- 4.550 What is/was the economic mobility of your mother? (1) promotion since employed; (2) same job level since employed; (3) demoted (lower level of employment) since employed; (4) quit job; (5) never employed; (6) fired, laid off.

- 4.560 What is your level of economic satisfaction? (1) Very Satisfied; (2) Satisfied; (3) Neutral; (4) Dissatisfied; (5) Very Dissatisfied.
- 4.570 Is your home owned by you and your family? (1) Yes; (2) No.
- 4.580 What is the value of your home? (0) N/A (e.g. not owner;)  
(1) \$200,000 or over; (2) \$150,000- 199,999; (3) \$100,000-149,999; (4) \$75,000-99,999; (5) \$50,000-74,999; (6) \$25,000-49,999; (7) \$24,999 or less.
- 4.581 If renting, what is your monthly rental? (0) N/A (e.g., owner; living at home); (1) \$1,000 or over; (2) \$800-999; (3) \$500-799; (4) \$300-499; (5) \$200-299; (6) \$100-199; (7) \$99 or less.
- 4.590 Does your spouse/ex-spouse contribute financially to your support? (0) No spouse; (1) Yes; (2) No.
- 4.600 What would your spouse's/ex-spouse's occupational level be if he/she applied for a job now? (0) N/A e.g., No spouse (1) Professional; (2) Manager, official or proprietor; (3) Clerical, sales, secretarial; (4) Craftsman, foreman, skilled worker, independent farmer; (5) Operative or trade worker; (6) Service worker, including private household (e.g., cleaner; waiter/waitress); (7) Labourer, unskilled worker.

- 4.610 What is the employment status of your spouse/ex-spouse?  
(0) N/A (e.g., no spouse); (1) unemployed by choice (e.g., student, full-time homemaker); (2) full-time employment; (3) part-time employment by choice; (4) retired; (5) part-time employment, but would like full-time work; (6) unemployed and wants employment.
- 4.620 If your spouse/ex-spouse is employed, how long has he/she been in the present job? (0) N/A (e.g., no spouse; spouse unemployed; spouse retired; (1) 5 years or more; (2) 3-4 years; (3) 1-2 years; (4) 6-11 months; (5) 5 months or less.
- 4.621 If your spouse/ex-spouse is unemployed how long has he/she been unemployed? (0) N/A (e.g., no spouse, spouse employed; (1) spouse does not want employment); (2) one month or less; (3) 2-5 months; (4) 6-11 months; (5) 12-17 months; (6) 18-23 months; (7) 2-3 years; (8) 4 years or more.
- 4.630 What is/was the economic mobility of your spouse/ex-spouse?  
(0) N/A (e.g., no spouse); (1) promotion since employed; (2) same job level since employed; (3) demoted (lower level of employment) since employed; (4) quit job; (5) never employed; (6) fired, laid off.
- 4.640 What is your spouse's/ex-spouse's annual income?  
(0) N/A (e.g., no spouse); (1) \$50,000 or over; (2) \$40,000-49,999; (3) \$30,000-39,999; (4) \$20,000-29,999; (5) \$10,000-19,999; (6) \$9,999 or less.

Section 5. DEMOGRAPHIC DATA FOR CLIENTS.

- 5.650 How would you describe where you live? (1) Rural (country); (2) Small Town; (3) Urban (e.g., large city; small city; town).
- 5.660 What accommodation do you have? (1) Single family dwelling; (2) Duplex; (3) Apartment/Condominium; (4) Mobile home; (5) Room and board; (6) Single room; (7) No fixed address.
- 5.670 How would you describe the community facilities?  
(1) Excellent (e.g. community centre, recreational park);  
(2) Good; (3) Adequate; (4) Poor; (5) Non-existent.
- 5.680 How would you rate your use of community facilities?  
(1) High; (2) Moderate; (3) Little; (4) None.
- 5.690 How long have you lived at your present address? (1) 5 years or more; (2) 3-4 years; (3) 1-2 years; (4) 6-11 months; (5) 5 months or less.
- 5.700 How long have you lived in this city, town or region?  
(1) 5 years or more; (2) 3-4 years; (3) 1-2 years;  
(4) 6-11 months; (5) 5 months or less.
- 5.710 How long have you lived in this province or state? (1) 5 years or more; (2) 3-4 years; (3) 1-2 years; (4) 6-11 months; (5) 5 months or less.
- 5.720 How many moves have you made in the last 5 years? (1) None; (2) One; (3) Two; (4) Three; (5) Four; (6) Five or more.
- 5.730 If, for any reason, you had to move from where you live now to some other neighbourhood, how would you feel? (1) Very unhappy; (2) Unhappy; (3) Indifferent; (4) Happy to move; (5) Very happy to move.

## APPENDIX II

## SCL-90-R

|                                             |  |                                            |  |
|---------------------------------------------|--|--------------------------------------------|--|
| Name: _____                                 |  | Technician: _____ Ident. No. _____         |  |
| Location: _____                             |  | Visit No.: _____ Mode: S-R _____ Nar _____ |  |
| Age: _____ Sex: M _____ F _____ Date: _____ |  | Remarks: _____                             |  |

**INSTRUCTIONS**

Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select one of the numbered descriptors that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST \_\_\_\_\_ INCLUDING TODAY. Place that number in the open block to the right of the problem. Do not skip any items, and print your number clearly. If you change your mind, erase your first number completely. Read the example below before beginning, and if you have any questions please ask the technician.

| EXAMPLE                                                                                 | Descriptors    |
|-----------------------------------------------------------------------------------------|----------------|
| HOW MUCH WERE YOU DISTRESSED BY:                                                        | 0 Not at all   |
| Ex. Body Aches..... Ex. <span style="border: 1px solid black; padding: 0 2px;">3</span> | 1 A little bit |
|                                                                                         | 2 Moderately   |
|                                                                                         | 3 Quite a bit  |
|                                                                                         | 4 Extremely    |

| HOW MUCH WERE YOU DISTRESSED BY: | Descriptors    |
|----------------------------------|----------------|
| 0 Not at all                     | 0 Not at all   |
| 1 A little bit                   | 1 A little bit |
| 2 Moderately                     | 2 Moderately   |
| 3 Quite a bit                    | 3 Quite a bit  |
| 4 Extremely                      | 4 Extremely    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Headaches..... <input type="checkbox"/><br>2. Nervousness or shakiness inside..... <input type="checkbox"/><br>3. Repeated unpleasant thoughts that won't leave your mind..... <input type="checkbox"/><br>4. Faintness or dizziness..... <input type="checkbox"/><br>5. Loss of sexual interest or pleasure..... <input type="checkbox"/><br>6. Feeling critical of others..... <input type="checkbox"/><br>7. The idea that someone else can control your thoughts..... <input type="checkbox"/><br>8. Feeling others are to blame for most of your troubles..... <input type="checkbox"/><br>9. Trouble remembering things..... <input type="checkbox"/><br>10. Worried about sloppiness or carelessness..... <input type="checkbox"/><br>11. Feeling easily annoyed or irritated..... <input type="checkbox"/><br>12. Pains in heart or chest..... <input type="checkbox"/><br>13. Feeling afraid in open spaces or on the streets..... <input type="checkbox"/><br>14. Feeling low in energy or slowed down..... <input type="checkbox"/><br>15. Thoughts of ending your life..... <input type="checkbox"/><br>16. Hearing voices that other people do not hear..... <input type="checkbox"/><br>17. Trembling..... <input type="checkbox"/><br>18. Feeling that most people cannot be trusted..... <input type="checkbox"/><br>19. Poor appetite..... <input type="checkbox"/><br>20. Crying easily..... <input type="checkbox"/><br>21. Feeling shy or uneasy with the opposite sex..... <input type="checkbox"/><br>22. Feelings of being trapped or caught..... <input type="checkbox"/><br>23. Suddenly scared for no reason..... <input type="checkbox"/><br>24. Temper outbursts that you could not control..... <input type="checkbox"/><br>25. Feeling afraid to go out of your house alone..... <input type="checkbox"/><br>26. Blaming yourself for things..... <input type="checkbox"/><br>27. Pains in lower back..... <input type="checkbox"/> | 28. Feeling blocked in getting things done..... <input type="checkbox"/><br>29. Feeling lonely..... <input type="checkbox"/><br>30. Feeling blue..... <input type="checkbox"/><br>31. Worrying too much about things..... <input type="checkbox"/><br>32. Feeling no interest in things..... <input type="checkbox"/><br>33. Feeling fearful..... <input type="checkbox"/><br>34. Your feelings being easily hurt..... <input type="checkbox"/><br>35. Other people being aware of your private thoughts..... <input type="checkbox"/><br>36. Feeling others do not understand you or are unsympathetic..... <input type="checkbox"/><br>37. Feeling that people are unfriendly or dislike you..... <input type="checkbox"/><br>38. Having to do things very slowly to insure correctness..... <input type="checkbox"/><br>39. Heart pounding or racing..... <input type="checkbox"/><br>40. Nausea or upset stomach..... <input type="checkbox"/><br>41. Feeling inferior to others..... <input type="checkbox"/><br>42. Soreness of your muscles..... <input type="checkbox"/><br>43. Feeling that you are watched or talked about by others..... <input type="checkbox"/><br>44. Trouble falling asleep..... <input type="checkbox"/><br>45. Having to check and doublecheck what you do..... <input type="checkbox"/><br>46. Difficulty making decisions..... <input type="checkbox"/><br>47. Feeling afraid to travel on buses, subways, or trains..... <input type="checkbox"/><br>48. Trouble getting your breath..... <input type="checkbox"/><br>49. Hot or cold spells..... <input type="checkbox"/><br>50. Having to avoid certain things, places, or activities because they frighten you..... <input type="checkbox"/><br>51. Your mind going blank..... <input type="checkbox"/><br>52. Numbness or tingling in parts of your body..... <input type="checkbox"/> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

PAGE ONE



## SCL-90-R

| HOW MUCH WERE YOU DISTRESSED BY:                                                                         | HOW MUCH WERE YOU DISTRESSED BY:                                                                     |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <u>Descriptors</u><br>0 Not at all<br>1 A little bit<br>2 Moderately<br>3 Quite a bit<br>4 Extremely     | <u>Descriptors</u><br>0 Not at all<br>1 A little bit<br>2 Moderately<br>3 Quite a bit<br>4 Extremely |
| 53. A lump in your throat ..... <input type="checkbox"/>                                                 | 71. Feeling everything is an effort ..... <input type="checkbox"/>                                   |
| 54. Feeling hopeless about the future ..... <input type="checkbox"/>                                     | 72. Spells of terror or panic ..... <input type="checkbox"/>                                         |
| 55. Trouble concentrating ..... <input type="checkbox"/>                                                 | 73. Feeling uncomfortable about eating or drinking in public ..... <input type="checkbox"/>          |
| 56. Feeling weak in parts of your body ..... <input type="checkbox"/>                                    | 74. Getting into frequent arguments ..... <input type="checkbox"/>                                   |
| 57. Feeling tense or keyed up ..... <input type="checkbox"/>                                             | 75. Feeling nervous when you are left alone. .... <input type="checkbox"/>                           |
| 58. Heavy feelings in your arms or legs ..... <input type="checkbox"/>                                   | 76. Others not giving you proper credit for your achievements ..... <input type="checkbox"/>         |
| 59. Thoughts of death or dying ..... <input type="checkbox"/>                                            | 77. Feeling lonely even when you are with people ..... <input type="checkbox"/>                      |
| 60. Overeating ..... <input type="checkbox"/>                                                            | 78. Feeling so restless you couldn't sit still ..... <input type="checkbox"/>                        |
| 61. Feeling uneasy when people are watching or talking about you ..... <input type="checkbox"/>          | 79. Feelings of worthlessness ..... <input type="checkbox"/>                                         |
| 62. Having thoughts that are not your own ..... <input type="checkbox"/>                                 | 80. The feeling that something bad is going to happen to you ..... <input type="checkbox"/>          |
| 63. Having urges to beat, injure, or harm someone ..... <input type="checkbox"/>                         | 81. Shouting or throwing things ..... <input type="checkbox"/>                                       |
| 64. Awakening in the early morning ..... <input type="checkbox"/>                                        | 82. Feeling afraid you will faint in public ..... <input type="checkbox"/>                           |
| 65. Having to repeat the same actions such as touching, counting, washing ..... <input type="checkbox"/> | 83. Feeling that people will take advantage of you if you let them ..... <input type="checkbox"/>    |
| 66. Sleep that is restless or disturbed ..... <input type="checkbox"/>                                   | 84. Having thoughts about sex that bother you a lot ..... <input type="checkbox"/>                   |
| 67. Having urges to break or smash things ..... <input type="checkbox"/>                                 | 85. The idea that you should be punished for your sins. .... <input type="checkbox"/>                |
| 68. Having ideas or beliefs that others do not share ..... <input type="checkbox"/>                      | 86. Thoughts and images of a frightening nature ..... <input type="checkbox"/>                       |
| 69. Feeling very self-conscious with others ..... <input type="checkbox"/>                               | 87. The idea that something serious is wrong with your body .. <input type="checkbox"/>              |
| 70. Feeling uneasy in crowds, such as shopping or at a movie ..... <input type="checkbox"/>              | 88. Never feeling close to another person ..... <input type="checkbox"/>                             |
|                                                                                                          | 89. Feelings of guilt ..... <input type="checkbox"/>                                                 |
|                                                                                                          | 90. The idea that something is wrong with your mind. .... <input type="checkbox"/>                   |

## APPENDIX III

## BSI

|                                            |  |                                          |  |
|--------------------------------------------|--|------------------------------------------|--|
| Name: _____                                |  | Patient No. _____ Technician _____       |  |
| Location: _____                            |  | Visit No. _____ Mode S-R _____ Nar _____ |  |
| Age: _____ Sex M _____ F _____ Date: _____ |  | Remarks: _____                           |  |

INSTRUCTIONS

Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select one of the numbered descriptors that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST \_\_\_\_\_ INCLUDING TODAY. Place that number in the open block to the right of the problem. Do not skip any items, and print your number clearly. If you change your mind, erase your first number completely. Read the example below before beginning, and if you have any questions please ask the technician.

| EXAMPLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>HOW MUCH WERE YOU DISTRESSED BY:      <u>Descriptors</u></p> <p style="text-align: right; padding-right: 20px;">0 Not at all</p> <p style="text-align: right; padding-right: 20px;">1 A little bit</p> <p style="text-align: right; padding-right: 20px;">2 Moderately</p> <p style="text-align: right; padding-right: 20px;">3 Quite a bit</p> <p style="text-align: right; padding-right: 20px;">4 Extremely</p> <p>EX. Body Aches ..... Ex. <span style="border: 1px solid black; padding: 0 5px;">  </span>      Answer</p> | <p>HOW MUCH WERE YOU DISTRESSED BY      <u>Descriptors</u></p> <p style="text-align: right; padding-right: 20px;">0 Not at all</p> <p style="text-align: right; padding-right: 20px;">1 A little bit</p> <p style="text-align: right; padding-right: 20px;">2 Moderately</p> <p style="text-align: right; padding-right: 20px;">3 Quite a bit</p> <p style="text-align: right; padding-right: 20px;">4 Extremely</p> |

| HOW MUCH WERE YOU DISTRESSED BY:                                                          |                                                                                                                    |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1. Nervousness of shakiness inside ..... <input type="checkbox"/>                         | 28. Feeling afraid to travel on buses, subways, or trains ..... <input type="checkbox"/>                           |
| 2. Faintness or dizziness ..... <input type="checkbox"/>                                  | 29. Trouble getting your breath ..... <input type="checkbox"/>                                                     |
| 3. The idea that someone else can control your thoughts ..... <input type="checkbox"/>    | 30. Hot or cold spells ..... <input type="checkbox"/>                                                              |
| 4. Feeling others are to blame for most of your troubles ..... <input type="checkbox"/>   | 31. Having to avoid certain things, places, or activities because they frighten you ..... <input type="checkbox"/> |
| 5. Trouble remembering things ..... <input type="checkbox"/>                              | 32. Your mind going blank ..... <input type="checkbox"/>                                                           |
| 6. Feeling easily annoyed or irritated ..... <input type="checkbox"/>                     | 33. Numbness or tingling in parts of your body ..... <input type="checkbox"/>                                      |
| 7. Pains in heart or chest ..... <input type="checkbox"/>                                 | 34. The idea that you should be punished for your sins ..... <input type="checkbox"/>                              |
| 8. Feeling afraid in open spaces ..... <input type="checkbox"/>                           | 35. Feeling hopeless about the future ..... <input type="checkbox"/>                                               |
| 9. Thoughts of ending your life ..... <input type="checkbox"/>                            | 36. Trouble concentrating ..... <input type="checkbox"/>                                                           |
| 10. Feeling that most people cannot be trusted ..... <input type="checkbox"/>             | 37. Feeling weak in parts of your body ..... <input type="checkbox"/>                                              |
| 11. Poor appetite ..... <input type="checkbox"/>                                          | 38. Feeling tense or keyed up ..... <input type="checkbox"/>                                                       |
| 12. Suddenly scared for no reason ..... <input type="checkbox"/>                          | 39. Thoughts of death or dying ..... <input type="checkbox"/>                                                      |
| 13. Temper outbursts that you could not control ..... <input type="checkbox"/>            | 40. Having urges to beat, injure, or harm someone ..... <input type="checkbox"/>                                   |
| 14. Feeling lonely even when you are with people ..... <input type="checkbox"/>           | 41. Having urges to break or smash things ..... <input type="checkbox"/>                                           |
| 15. Feeling blocked in getting things done ..... <input type="checkbox"/>                 | 42. Feeling very self-conscious with others ..... <input type="checkbox"/>                                         |
| 16. Feeling lonely ..... <input type="checkbox"/>                                         | 43. Feeling uneasy in crowds ..... <input type="checkbox"/>                                                        |
| 17. Feeling blue ..... <input type="checkbox"/>                                           | 44. Never feeling close to another person ..... <input type="checkbox"/>                                           |
| 18. Feeling no interest in things ..... <input type="checkbox"/>                          | 45. Spells of terror or panic ..... <input type="checkbox"/>                                                       |
| 19. Feeling fearful ..... <input type="checkbox"/>                                        | 46. Getting into frequent arguments ..... <input type="checkbox"/>                                                 |
| 20. Your feelings being easily hurt ..... <input type="checkbox"/>                        | 47. Feeling nervous when you are left alone ..... <input type="checkbox"/>                                         |
| 21. Feeling that people are unfriendly or dislike you ..... <input type="checkbox"/>      | 48. Others not giving you proper credit for your achievements ..... <input type="checkbox"/>                       |
| 22. Feeling inferior to others ..... <input type="checkbox"/>                             | 49. Feeling so restless you couldn't sit still ..... <input type="checkbox"/>                                      |
| 23. Nausea or upset stomach ..... <input type="checkbox"/>                                | 50. Feelings of worthlessness ..... <input type="checkbox"/>                                                       |
| 24. Feeling that you are watched or talked about by others ..... <input type="checkbox"/> | 51. Feeling that people will take advantage of you if you let them ..... <input type="checkbox"/>                  |
| 25. Trouble falling asleep ..... <input type="checkbox"/>                                 | 52. Feelings of guilt ..... <input type="checkbox"/>                                                               |
| 26. Having to check and doublecheck what you do ..... <input type="checkbox"/>            | 53. The idea that something is wrong with your mind ..... <input type="checkbox"/>                                 |
| 27. Difficulty making decisions ..... <input type="checkbox"/>                            |                                                                                                                    |

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Grade pour lequel cette thèse fut présentée

MSC

Year this degree conferred  
Année d'obtention de ce grade

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Name of Supervisor - Nom du directeur de thèse

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