THE RELATIONSHIP AMONG STRESS, ANXIETY,

SELF CONCEPT, SOCIAL SUPPORT AND

ILLNESS IN CHILDREN

DISSERTATION

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This research study was designed to investigate the
relationships of stress, anxiety, self concept, social sup-
port and illness in children and to examine the potential of
specific cognitive mediating variables, self concept and
anxiety, and an external mediating variable, social support
and an interaction between self concept and social support,
to significantly increase the efficiency of stress as a
predictor of children's illness. The purposes of this study
were   (1) to determine if stressful life events, anxiety,
self concept, social support, sex and illness are related
in children, (2) to determine if stressful life events are
an adequate predictor of illness in children, (3) to deter-
mine if a combination of anxiety, self concept and social
support will increase the predictive efficiency concerning
illness in children, (4) to provide information that may
help develop a theoretical base concerning stressful life
events and illness in children, and (5) to provide informa-
tion that may be beneficial with regard to future research
involving stress, anxiety, self concept, social support,
sex and illness in children.

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A total of 138 subjects, from the public school system of a midwestern town, comprised the sample of convenience. The following instruments were administered: the Social Readjustment Rating Questionnaire (SRRQ), the Piers-Harris Children's Self Concept Scale (CSCS), the State Trait Anxiety Inventory for Children (STAIC), an adapted form of the Seriousness of Illness Rating Scale (SIRS) and a sociometric test. The data were treated using correlation and multiple linear regression.

Of the seven correlations investigated, three were found to be significant, life stress (SRRQ) with illness (SIRS), life stress (SRRQ) with self concept (CSCS), and self concept (CSCS) with trait anxiety (STAIC).

One of the eight variables added to life stress as a predictor of illness in children significantly increased the efficiency of prediction, the social support variable of sociometric choice status. The most efficient model, found by stepwise regression, included life stress and sociometric choice status which accounted for a combined 11% of the variance in predicting children's illness.

The results of this study support the role of external mediating variables in the stress-illness process of children. Cognitive mediating variables such as trait anxiety and self concept did not add significantly to stress as a predictor of children's illness.

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Chapter I

INTRODUCTION

Stress as an etiological factor in illness has been
the subject of much research over the past three decades.
The results of this research suggest stress is a factor not
only in an individual's susceptibility to physical illness,
but also to the severity, duration and outcome of any ill-
ness, not just those designated as psychosomatic (Rabkin &
Struening, 1976; Dodge & Martin, 1970). Having established
this relationship between stress and illness, more recent
research has turned to an exploration of variables that may
moderate the impact of stress on illness.

One problem that has plagued researchers exploring
the stress and illness association is the lack of a con-
sistent definition of stress. Mechanic (1968) defines
stress as "a discrepancy between the demands impinging on a
person--whether these demands be external or internal, whe-
ther challenges or goals--and the individual's potential
responses to these demands" (p. 301). Basowitz, et al.
(1955) define stress as a characteristic of the situation
that is largely independent of the responses of individuals
to it. Alexander (1950) and Wolff (1953) combine the essen-
tial elements of these definitions by defining stress both

as a quality of the situation as well as the individual's
response to it. Thus, the confusion in definition is
readily apparent. It appears that the operational defini-
tion of stress varies with the conceptual model of the
researcher (Scott & Howard, 1970).

These problems in definition have prompted some
authors to suggest foregoing the use of the term _stress_
(Hinkle, 1974), while others urge the use of the term to
label a complex, interdisciplinary area of study (Monat &
Lazarus, 1977). Lazarus (1966) has recommended:

> It seems wise to use stress as a generic
> term for the whole area of problems that
> include the stimuli producing stress reac-
> tions, the reactions themselves, and the
> various intervening processes. (p. 27)

In recent research which explores the relationship
between stress and illness, stress has often been opera-
tionally defined in terms of specific life events. The
relationship between stressful life events and illness in
adults has been well documented in the literature (Rahe &
Lind, 1971; Rahe et al., 1970; Bramwell et al., 1975).
These studies do not presume to establish a cause-effect
relationship between stress and illness. The researchers
simply note that many forms of illness are manifested in an
environment characterized by stressful life events. The
extent to which the physiological changes that occur in
response to stress can actually cause illness is a question
still open to speculation.

Stress as an etiological factor in illness of children is not as well documented as it is for adults. Intuitively the relationship between childhood illnesses and stressful life events should be similar to the association found in adults and a number of studies do support this hypothesis (Greene & Miller, 1958; Heisel, 1973). However, a void exists in this area of research.

An issue that warrants further investigation in life stress and illness research is the possibility of interaction between life changes and other factors that affect the impact of stress. Not all people who experience even traumatic events become physically disabled. Exposure to stressful life events alone is not a totally sufficient predictor of the onset of illness (Rabkin & Struening, 1976). Individual characteristics may be the critical factors in determining the nature and severity of an individual's stress reaction.

Anxiety is an individual characteristic variable which may mediate the impact of stress on health. An association between anxiety and illness is supported by research. Branch (1968) found that heart disease, skin problems, stomach problems, allergies, pain and obesity are related to anxiety in adults. The relationship between anxiety and children's illnesses is not as well supported, although the limited research done tentatively documents that association (Kumar et al., 1976). The results of

Kumar's study (1976), however, suggest that ill children experience less anxiety than healthy children, which is not the relationship that might be expected. Such results are confusing and further research is needed for clarification.

Self concept may also be a factor which influences the relationship between stress and illness. Bedell et al. (1977) found self concept to be related to illness in children. They report that children with high self concepts who report fewer stressful situations tend to experience fewer episodes of illness than children with low self concepts and a higher number of stressful experiences. However, the sample for this study was a group of chronically ill children. Further research is needed to examine the interaction between stress, self concept and illness in a population of healthy children.

The association between stressful experiences and illness may be affected by external mediating variables such as social support, as well as by individual characteristics. Supports which are available to individuals in their social environments may influence their experience of stress and therefore, their vulnerability to illness (Rabkin & Struening, 1976). Many researchers involved in studies that examine this relationship suggest that social support is a factor which serves to buffer the negative consequences of stressful life events (Hirsch, 1980; Sandler, 1980; Kaplan et al., 1977; Dean & Lin, 1977). Cobb (1976) reviewed over

50 studies covering a variety of transitions in the life cycle from birth to death showing social support to be protective. Both Cassell (1976) and Henderson (1977) have published reviews on a wide range of studies which suggest that the social support provided by primary groups serves to buffer or cushion the individual from the physiological or psychological consequences of exposure to stressful life events.

Social isolation as a factor related to social support has been identified as a major factor in increased risk of illness. Research findings have shown that adults who live alone and are uninvolved with other people have an increased vulnerability to illness (Holmes, 1956; Levy & Rowitz, 1969; Linsky, 1970). Some research demonstrates that the effects of stressful experiences may be moderated if children are supported by older siblings in the home and if both parents are living in the home (Sandler & Ramsey, 1980). The results of the available limited research suggest that low social support is associated with illness in adults and that social support is a mediating variable on the effects of stressful life events in children. No research studies were located which examine the interaction among stressful life events, social support and physical illness in children. Increased knowledge about the stress buffering functions of social support has important implications for primary prevention. Although it may not be

possible to obviate routine life stresses or modify genetic or constitutional factors, it might be possible to mobilize social support systems into community health service (Dean & Lin, 1977) and thereby reduce the impact of stress on physical health.

Research is needed to determine if individual characteristics such as anxiety and self concept, and external variables such as social support, interact with stressful life events to produce illness in children. Research in this area could provide a model for identifying children who are at high risk for later illness. Such research could also provide information for professionals working with children about possible points of intervention that would most effectively moderate the effects of stressful experiences on children.

Statement of the Problem

The problem of this study was to determine the relationships among stress, anxiety, self concept, social support, sex and illness in children.

Purposes of the Study

The purposes of this study were (1) to determine if stressful life events, anxiety, self concept, social support, sex and illness are related in children, (2) to determine if stressful life events are an adequate predictor

of illness in children, (3) to determine if a combination
of anxiety, self concept and social support will increase
the predictive efficiency concerning illness in children,
(4) to provide information that may help develop a theoreti-
cal base concerning stressful life events and illness in
children, and (5) to provide information that may be bene-
ficial with regard to future research involving stress,
anxiety, self concept, social support, sex and illness in
children.

<div align="center">Definitions</div>

Illness can be defined as "an abnormal impairment,
disorder or derangement of any function of an individual"
(English & English, 1966, p. 157). According to Wan and
Livierators (1978), the concept of disease is a complex
phenomenon consisting of the interaction of physical, mental
and social factors. For the purposes of this study, illness
was defined in terms of scores on the Seriousness of Illness
Rating Scale (Wyler et al., 1970), adapted for use with
children by this researcher.

Anxiety may be defined in terms of "the intensity of
the subjective feelings of tension, apprehension, nervous-
ness, and worry that are experienced by an individual at a
particular moment, and by heightened activity of the auto-
nomic nervous system that accompanies these feelings"
(Spielberger, 1976, p. 5). For the purposes of this study,

anxiety was defined by scores on the State-trait Anxiety Inventory for Children.

Self concept may be defined as the perceptions individuals hold about themselves or as a set of beliefs about self (Briggs, 1975). Briggs (1975, p. 24) states:

> Whenever a youngster sees himself as a loser, he expects to fail and behaves so that success is less likely. Once he stops believing in himself, he is headed for failure. The youngster with a history of past successes expects to do well.

For the purposes of this study, self concept was defined by scores on the Piers-Harris Children's Self Concept Scale.

Stress has been defined as generalized physiological responses to any demands made on an individual (Selye, 1956). Dohrenwend (1973) suggests that stress is a part of everyone's daily life. For the purposes of this study, events that call for an adaptive change by an individual were considered stressful. The Social Readjustment Rating Questionnaire (Coddington, 1972) was used to quantify the amount of stress experienced by the child.

Social Support systems consist of longstanding ties to a group of people who can be relied upon to provide emotional nurturance and assistance in times of need (Caplan, 1974). Ideally, a child belongs to several groups situated both at home and at school. These groups may serve as a buffer between the individual and stress. For the purposes of this study, social support was defined as the number of

siblings living in the home, the number of parents living in the home, and the number of choices received on a sociometric measure.

Background

Research exploring the relationship between stress and children's illness is notably sparse in the literature when compared to the amount of research done with adults in this area. A limited number of isolated studies have explored the relationship between physical illness, life events and stress level of children as measured by varying techniques.

Knight (1979) utilized cortisol production rates as a measure of stress in exploring the correlation between distress, effectiveness of ego defenses and adjustment to the routine of a hospital ward. She concluded that children who use the defense of intellectualization experienced significantly less stress than children who used denial as their major defense.

In addition to physiological measures, researchers have employed techniques that measure responses that appear secondary to physiological stress reactions. One such measure utilized by Sturner et al. (1980) explored a procedure to prepare children for venipuncture in order to reduce the potential stressfulness of such a medical procedure. Stress was assumed to be reduced if fewer emotional

indicators were scored for the human figure drawings of the prepared children than for the unprepared children following the venipuncture procedure. The researchers found that children who were prepared for the venipuncture procedure showed fewer emotional indicators in their human figure drawings than children who were not prepared. It was concluded that prepared children experienced less stress.

Most of the research which has examined stressful life events in children (Heisel, 1973; Sandler, 1980) has been based on Coddington's (1972) adaptation of the Social Readjustment Rating Scale which was developed by Holmes and Rahe (1967). The underlying premise of this instrument is that certain life events are associated, to a greater or lesser degree, with stress. Coddington developed a list of life events believed to occur in the lives of children and attached a readjustment value to each event. The amount of social-psychological readjustment a child has undergone during a specific time period is determined by summing the readjustment values (Coddington, 1972).

The relationship between stress and illness in adults has been explored in a number of recent studies. Rahe and Lind (1971) found cardiac death to be associated with stress. Rahe, Mahan and Arthur (1970) found myocardial infarction to be related to stress level and Bramwell et al. (1975) suggest athletic injuries show a relationship to level of stress.

Stressful life events as etiological factors in the illness of children has received less attention than such research with adults. Greene and Miller (1958) found that major life stress may be one of the precipitating factors in the onset of the manifest symptoms of leukemia in children. Heisel (1973) found that 34 percent of the children in a hospital patient population experienced frequent or severe life events in the year preceding the onset of illness. This was a rate two to three times higher than found in a non-patient population. The authors do not suggest a cause-effect relationship between illness and stress, but simply note that some forms of childhood illnesses arise in a context in which certain life events occur (Jacobs, 1980).

Stressful life events, however, are not totally sufficient predictors of illness. Many people who experience stress do not suffer major illness. It would seem that some factors are moderating the effect of stress for some people. Anxiety may be one such variable. Leavitt (1967, p. 196) defines anxiety as a "state of nonspecific, physiological arousal or activitation." Research offers some support for a link between anxiety and illness.

In a study comparing the anxiety levels of a group of healthy children with a group of children with sickle cell anemia, Kumar et al. (1976) found the anxiety levels of the ill children to be lower than for the healthy children. The authors offered no explanation for this phenomenon.

However, this study does not trace the role of anxiety in the etiology of sickle cell anemia. No studies were found that explored the relationship between stress, anxiety and disease in children. Do children who have experienced stressful situations exhibit high levels of anxiety? Such research could have implications for helping children to either learn to cope effectively with stressful situations or for changing the environment as suggested by Sandler and Ramsey (1980).

Self concept has also been found to be related to stress. In one study by Reavley (1974), subjects were administered the IPAT Anxiety Scale and the Social Readjustment Rating Scale. Of interest to this study are the results of the "Q3" subscale of the IPAT Anxiety Scale which measures the degree of behavior integration with self concept. Reavley found that high scores on the "Q3" subscale and high scores on the Social Readjustment Rating Scale were significantly correlated. He concluded that concern for self concept appears to be related highly to life stress scores.

One study was found relating self concept to life stress which used children as subjects. Using the Social Readjustment Rating Scale, Bedell et al. (1977) divided a group of chronically ill children into high stress and low stress groups. The Piers-Harris Self Concept Scale was then administered to each subject in each group. The low stress

group displayed more positive self concepts than the high stress group.

A mediating variable occurring in the environment that may temper the effects of stress is social support. The moderating influence of social supports has been suggested in recent research (Dean & Lin, 1977; Cobb, 1976). These authors conclude that information that one is loved, esteemed and belongs to a network of communication and mutual obligation reduces the amount of stress experienced by adults.

Sandler (1980) administered a 32-item recent life events scale and the Louisville Behavior Check List, Form E2 to a group of young economically poor children. Data were also collected identifying three sources of social support: (1) presence of older siblings in the home, (2) number of parents living in the home, and (3) ethnic congruence with the local community. The researchers concluded that the presence of older siblings in the home and the presence of two parents in the home serve as effective sources of social support which moderate the effects of stress on children.

While Sandler's (1980) study lends support to the moderating influence of social support on stress, a question still remains concerning the interaction of stress, social support and illness in children. No studies were found which investigate the relationship among these three variables.

After reviewing the literature, several research questions remain unanswered. No research was found which examined the relationship between stress and anxiety in children. Do children experience greater anxiety when confronted with stressful life events? Similar related questions involve the possible relationships between stress and such variables as self concept and social support. If these factors prove to be related, what is the nature of their impact on the effects of stress? It appears important, therefore, that in order to more fully examine the relationship between stress and children's illnesses, research in the area of stress, self concept, anxiety and social support and children's illnesses should be done.

Hypotheses

1. There will be a significant positive correlation between stressful life events and illness in children as determined by scores on the Social Readjustment Rating Questionnaire and the Seriousness of Illness Rating Scale.

2. There will be a significant positive correlation between stressful life events and anxiety in children as determined by scores of the Social Readjustment Rating Questionnaire and the State-trait Anxiety Inventory for Children.

3. There will be a significant negative correlation between stressful life events and self concept in children as determined by scores on the Social Readjustment Rating

<u>Questionnaire</u> and the <u>Piers-Harris Children's Self Concept</u> <u>Scale</u>.

4.   There will be a significant negative correlation between stressful life events and social support in children as determined by scores on the <u>Social Readjustment Rating</u> <u>Questionnaire</u> and

a.   the number of choices received on a socio-metric measure,

b.   the number of siblings living in the home, and

c.   the number of parents living in the home.

5.   There will be a significant negative correlation between anxiety and self concept in children as determined by scores on the <u>State-trait Anxiety Inventory for Children</u> and the <u>Piers-Harris Children's Self-Concept Scale</u>.

Hypotheses 6-11 investigated the efficiency of the prediction of illness scores using the following selected variables. This stress model is based upon a dissertation by Harris (1980).

6.   Using as the basic model stress as a predictor of illness in children, a significant increase in R^{2*} will be obtained when trait anxiety is added to the model.

R^{2*} is that proportion of the variance of the dependent variable which is accounted for by the predictor variables.

7. Using as the basic model stress as a predictor of illness in children, a significant increase in R^{2*} will be obtained when self concept is added to the model.

8. Using as the basic model stress as a predictor of illness in children, a significant increase in R^{2*} will be obtained when social support is added to the model. Social support will be determined by

  a. the number of choices received on a sociometric measure,

  b. the number of siblings living in the home, and

  c. the number of parents living in the home.

9. Using as the basic model stress as a predictor of illness in children, no significant increase in R^{2*} will be obtained when a vector identifying sex is added to the model.

10. Using as the basic model stress as a predictor of illness in children, a significant increase in R^{2*} will be obtained when a multiplicative combination of self concept and social support is added to the model. That is, there will be a significant interaction between self concept and social support. Social support will be determined by

  a. the number of choices received on a sociometric measure,

  b. the number of siblings living in the home, and

c.   the number of parents living in the home.

11.   The most efficient model in predicting illness in children will include stress and some combination of anxiety, self concept and social support.

Delimitations

1.   Subjects were limited to fourth grade students in the Springfield public school system of a midwestern town of 133,000 population.

2.   The majority of subjects were from a lower middle class to upper middle class population.

Limitations

1.   Stress, self concept, anxiety and social support were limited to the sophistication of the instruments being used.

2.   The use of correlation procedures yielded information that only suggests an association between variables.   No cause-effect relationship can be inferred.

3.   The proportion of Black subjects was less than that found in the general population.

CHAPTER BIBLIOGRAPHY

Alexander, F. Psychosomatic medicine: Its principles and applications. New York: Norton, 1950.

Bosowitz, H., Persky, H., Korchin, K. S., & Grinker, R. R. Anxiety and stress. New York: McGraw-Hill, 1955.

Bedell, J. R. Life stress and psychological and medical adjustment of chronically ill children. Journal of Psychosomatic Research, 1977, 21, 237-242.

Bramwell, S. T., Masuda, M., Wagner, N. N., & Holmes, T. H. Psychological factors in athletic injuries: Development and application of the social and athletic readjustment rating scale (SARRA). Journal of Human Stress, 1975, 1, 6-20.

Branch, D. C. Your child's self-esteem. Garden City, New York: Doubleday and Company, 1975.

Caplan, J. Support systems and community mental health. New York: Behavioral Publications, 1974.

Cassell, J. The contribution of the social environment to host resistance. American Journal of Epidemiology, 1976, 104, 107-123.

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

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children. Journal of Psychosomatic Research, 1972, 16, 1-18.

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children-II: A study of a normal population. Journal of Psychosomatic Research, 1972, 16, 205-213.

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

Dodge, D. L., & Martin, W. T. Social stress and chronic illness: Mortality patterns in industrial society. Notre Dame, Indiana: University of Notre Dame, 1970.

Dohrenwend, B. S. Social status and stressful life events.
    Journal of Personality and Social Psychology, 1973, 28,
    225-235.

Gersten, J. C., Langer, T. S., Eisenberg, J. G., & Simcha-
    Fagan, O. An evaluation of the etiologic role of
    stressful life-events in psychological disorders.
    Journal of Health and Social Behavior, 1977, 18, 228-244.

Greene, W. A., & Miller, G. Psychological factors and
    reticuloendothelial disease. Psychosomatic Medicine,
    1958, 10, 124-144.

Harris, J. L. Imagery, self-concept, anxiety and stress as
    predictors of seriousness of disease. Unpublished
    doctoral dissertation, North Texas State University,
    1980.

Heisel, J. S. Life changes as etiological factors in juven-
    ile rheumatoid arthritis. Journal of Psychosomatic
    Research, 1972, 16, 411-420.

Henderson, A. S. The social network, support and neurosis:
    The function of attachment in adult life. British
    Journal of Psychiatry, 1977, 131, 185-191.

Hinkle, L. E., Jr. The effects of exposure to culture
    change, social change in interpersonal relationships on
    health. In B. Dohrenwend and B. Dohrenwend (Eds.),
    Stressful life events: Their nature and effects. New
    York: Wiley, 1974.

Hirsch, B. J. Natural support systems and coping with major
    life changes. American Journal of Community Psychology,
    1980, 8, 1-10.

Holmes, T. H. In P. J. Sparer (Ed.), Personality, stress
    and tuberculosis. New York: International Universities
    Press, 1956.

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

Jacobs, T. J., & Charles, E. Life events and cancer in
    children. Psychosomatic Medicine, 1980, 42, 11-24.

Kagan, J., & Havemann, E. Psychology: An introduction.
    New York: Harcourt Brace Jovanovich, 1980.

Kaplan, B. H., Cassel, J. C., & Gore, S. Social support and health. Medical Care, 1977, 15, 23-38.

Knight, R. B. Psychological stress, ego defenses and cortisol production in children hospitalized for elective surgery. Psychosomatic Medicine, 1979, 41, 40-49.

Kumar, S. D., Powars, J. A., & Haywood, L. J. Anxiety, self concept, and personal and social adjustments in children with sickle cell anemia. The Journal of Pediatrics, 1976, 88, 859-863. ⟩

Lazarus, R. S. Psychological stress and the coping process. New York: McGraw-Hill, 1966.

Leavitt, F., Garron, D. C., & Bieleauskas, L. A. Psychological disturbance and life event differences among patients with low back pain. Journal of Consulting and Clinical Psychology, 1980, 40, 115-116.

Levy, L., & Rowitz, L. The ecology of mental disorder. In S. E. Goldston (Ed.), Mental health considerations in public health. Washington: Government Printing Office, 1969.

Linsky, A. Who shall be excluded: The influence of personal attributes in community reaction to the mentally ill. Social Psychiatry, 1970, 5, 166-171.

McNeil, N. E., & Rubin, Z. The psychology of being human. New York: Canfield Press, 1977.

Martinez, A. Acculteration, imagery, self-concept, anxiety and stress as predictors of disease in Mexican Americans. Unpublished doctoral dissertation, North Texas State University, 1981.

Mechanic, D. Medical sociology: A selective view. New York: Free Press, 1968.

Monat, A., & Lazarus, R. S. Stress and coping. New York: Columbia University Press, 1977.

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

Rahe, R. H.. & Lind, E. Psychosocial factors and sudden cardiac death: A pilot study. Journal of Psychosomatic Research, 1971, 15, 19-24.

Rahe, R. H., Mahan, J. L., & Arthur, R. J. Prediction of near-future health change from subjects' preceding life changes. Journal of Psychosomatic Research, 1970, 14, 401-405.

Reavely, W. The relationship of life events to several aspects of anxiety. Journal of Psychosomatic Research, 1974, 18, 421-424.

Sandler, I. N., & Ramsey, T. B. Dimensional analysis of children's stressful life events. American Journal of Community Psychology, 1980, 8, 285-302.

Scott, R. A., & Howard, A. Models of stress. In S. Levine and H. A. Scotch (Eds.), Social stress. Chicago: Alding, 1970.

Selye, H. The stress of life. New York: McGraw-Hill, 1956.

Spielberger, C. D., & Diaz-Guerrero, R. Cross cultural anxiety. New York: John Wiley & Sons, 1976.

Sturner, R. A., Rothbaum, F., Visintainer, M., & Wolfer, J. The effects of stress on children's human figure drawings. Journal of Clinical Psychology, 1980, 36, 324-331.

Wan, T. T. H., & Livieratos, B. Interpreting a general index of subjective well-being. Milbank Memorial Fund Quarterly/Health and Society, 1978, 56, 531-556.

Wolff, H. G. Stress and disease. Springfield, Illinois: Charles C. Thomas, 1953.

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

Chapter II

REVIEW OF RELATED LITERATURE

A multitude of articles relating life events to ill-
ness have appeared with increasing regularity in major
psychological, psychosomatic, psychiatric and sociological
journals (Rabkin, 1976). The great majority of these
studies suggest that stressful life events can play a major
role in the etiology of various illnesses (Rahe, 1972;
Theorell, 1970; Rahe, 1971; Theorell, 1972; Kagan, 1971;
Selye, 1971). The thrust of these studies has been to
examine the relationship that may exist between stressful
events and later illness, although no causal relationship
has been established between the two.

Kagan and Levi (1974) reviewed over 180 articles
which examined the relationship between stress and illness.
They present a model of the relationship between these two
variables that includes the stimuli that arise from a social
situation which, given the present characteristics of an
individual, may or may not produce an emotional or physio-
logical response. These authors posit that illness in
relationship to psychosocial or psychobiological stimuli can
be promoted or prevented by interacting variables.

This study focuses on the impact of interacting
variables on the relationship between stressful life events

and illness in children. Unique to this study is the evaluation of the role of self-concept, anxiety and social support in mediating the impact of stress on the physical health of children. This review of literature is organized to present research on the effects and the interactions of stress, anxiety, self-concept and social support as they relate to illness in children. Since the role of children as subjects is limited in this field of study, selected studies are presented which employed adult subjects in order to support the direction of the hypotheses presented in this study.

One of the problems of research in the area of stress and human disease is the lack of continuity from study to study on just how stress is measured (Monat & Lazarus, 1977). This confusion makes it difficult to compare the available research efforts and prompted Cohen (1967) to state:

> Stress is one of those peculiar terms which is understood by everyone when used in a very general context but understood by very few when an operational definition is desired which is sufficiently specific to enable the precise testing of certain relationships. (p. 78)

Holmes and Rahe's (1967) Social Readjustment Rating Scale (SRRS) has provided an operational definition of stress in many recent research studies. The SRRS yields an operational definition of stress in terms of life change units. The Social Readjustment Rating Scale is a self-administered questionnaire which the person uses to report

the number of times the indicated life changes have occurred during a specified period of time, usually the preceding one or two-year period (Monat & Lazarus, 1977). Two different scoring methods are commonly used to interpret the instrument. The first method is a simple sum of the number of life changes experienced. The second method involves multiplying the number of times an event occurred by a weighted factor. Use of the second method implies that some events are more stressful than others and should contribute more to the total stress score than less stressful events.

Cannon (1929) observed over 50 years ago that stressful life events have a role to play in the etiology of disease. Meyer began in the 1930's to systematically record life events with his "life chart," and observed that certain changes and occurrences seemed to contribute to physical disorder (Justin et al., 1977; Meyer, 1951; Rabkin & Streuning, 1976). The original research conducted by Holmes and Rahe involved over 5,000 patients who were interviewed using Meyer's life chart. When the data were combined with information from the same patients' medical records, it was found that certain life events tended to occur prior to the emergence of manifest symptoms of illness (Holmes & Rahe, 1967). These events were used as the basis for the original Social Readjustment Rating Scale.

A pilot study was conducted by Holmes and Rahe (1967) which involved mailing the Schedule of Recent Events, an

adapted form of the Social Readjustment Rating Scale, to 200 resident physicians in the University of Washington integrated hospital system. The physicians were asked to list all "major health changes" by year of occurrence for the last 10 years. Eighty-eight physicians completed and returned the form.

To facilitate data analysis, Holmes and Rahe (1967) defined a life crisis as any clustering of life change events which summed to 150 or more, using the weighted scoring system, in one year when life change units were taken into account. Analysis of this data revealed a 93 percent association between reported health changes and life crisis, a greater than chance association significant at the .001 level. Further analysis of the data indicated that as the life change units increased, so did the percentage of illness. When life change units summed 150-199, 37 percent of the subjects experienced a health change. Fifty-one percent reported a health change when the sum of life change units was between 200 and 299. For those subjects whose life change units summed 300 or more, 79 percent had an associated health change (Holmes & Masuda, 1974).

The predictive quality of the Social Readjustment Rating Scale was evaluated in a follow-up study involving 84 of the original 88 subjects. Life change units for the previous 18 months were used as a base for predicting illness after 9 months. Analysis of these data indicated that

49 percent of the high risk group (300 or more life change units) reported illness, 25 percent of the medium risk group (200-299 life change units) and 9 percent of the low risk groups (150-199 life change units) reported illness (Holmes & Masuda, 1974). Holmes (1970), Thurlow (1971), Rahe (1968) and Rubin et al. (1969) conducted subsequent studies yielding similar results.

In 1972, Coddington modified the Social Readjustment Rating Questionnaire to include events that relate specifically to childhood life style (Coddington, 1972). Coddington used the method described by Holmes and Rahe (1967) adapted to children. However, rather than searching several thousand medical records for life events that preceded the onset of disease, Coddington simply listed events that occur in the lives of children based on his personal experience with normal and abnormal children and a review of the literature. This accumulated list of events was then submitted to 131 teachers, 25 pediatricians and 87 mental health workers employed in academic divisions of child psychiatry who were asked to draw on their personal experience to rate the events as to their relative degree of necessary readjustment for children. Data analysis revealed no significant differences in the rank order assigned to the items in any age group by group or subgroup of the respondents. There were significant differences between teachers, pediatricians and mental health professionals with regard to the readjustment

values assigned to the events. Mental health professionals tended to give higher estimates to the highest ranking events and lower estimates to the lowest ranking events for younger children, while teachers tended to make higher estimates of the readjustment required for older children on almost all events (Coddington, 1972).

A follow-up study was later conducted by Coddington to establish normal values for children of different ages and to investigate the influence of the demographic variables of sex, race, socioeconomic class and religion on the normal values. Three thousand, five hundred and twenty-six healthy children were surveyed. Analysis of the data revealed no differences in the number of listed life events experienced occurring between sexes, races or members of different socioeconomic classes. Differences between age groups did occur in that younger children experienced fewer events and older children experienced more events (Coddington, 1972).

Ninety-four subjects were excluded from the original population because they reported a serious illness requiring hospitalization. While the data on these subjects were not included in the analysis to determine age norms, the authors note that even when assigned life change value of the hospitalization was subtracted, the remaining score is considerably higher (211.17) than for the control group (151.62).

Whether or not this is a significant difference is not reported (Coddington, 1972).

Much of the existing research which has examined the relationship between childhood stress and childhood illness was conducted prior to Coddington's development of a life events scale to measure stress in children. Therefore, the studies reviewed will include those utilizing other stress measures as well as the few studies done which employed Coddington's scale. In addition, much of the research which has explored the relationship between life change and illness has been done with adult subjects. A selection of these studies will be reviewed in order to establish the correlation between stress and illness.

Stress and Illness

The association between stress and illness has been widely researched among adults, and generally the results indicate a significantly positive correlation. In some research studies stress is examined in relationship to a specific illness. A positive correlation was found between high levels of stress measured by the Social Readjustment Rating Scale and sudden cardiac death (Rahe & Lind, 1971). High life change scores and the onset of manifest symptoms of myocardial infarction were found to be significantly correlated by Rahe and Paasikini (1971), Theorell and Rahe (1971), and Edwards (1971).

Other research studies have explored stress in relationship to health in general rather than as associated with a specific illness. Holmes (1970) administered the Schedule of Recent Experiences to a group of 54 medical students at the beginning of their freshman year. At the end of their freshman year, 52 percent of the subjects reported major health changes. Of that group, 86 percent had achieved high life change scores, 48 percent achieved moderate life change scores and 33 percent achieved low life change scores (Holmes, 1970). This study is different from studies thus far reviewed in that the life change scores were obtained prior to the onset of illness, lending support to the predictive validity of the Schedule of Recent Experiences. Further support for predictive validity is found in Rahe's (1968) study of 2500 naval men. The population was divided into a high risk group (upper 30 percent of the life change scores) and a low risk group (lower 30 percent of the life change scores). Analysis of health change data collected 6 months after the Schedule of Recent Experience had been administered revealed that in the first month the high risk group had nearly 90 percent more first illnesses than the low risk group. In fact, for all 6 months of the time period under study, the high risk group reported more illnesses than the low risk group (Holmes & Masuda, 1974).

While the research examining the relationship between life change stress and illness in adults is

extensive, such research using children as subjects is less common. However, the few studies available do provide data supporting a significant relationship. As life change stress increases in the lives of children, the rate and severity of illness also increases (Mattsson & Gross, 1966; Stein & Charles, 1971; Heisel, 1972; Heisel et al., 1973; Boyce et al., 1977; Sheridan & Kline, 1978; Jacobs & Charles, 1980).

Over fifteen years ago Mattsson and Gross (1966) investigated the relationship between spontaneous bleeding episodes among hemophilic boys and social and familial variables. Among a subsample of 8 boys, spontaneous bleeding was encountered just prior to a highly anticipated event. The authors also report that during the first 12 years of life most of the 35 research subjects displayed long periods of freedom from major bleeding, alternating with periods of increased bleeding when mild trauma was encountered. These findings of Mattsson and Gross are supportive of the conclusions of Brown et al. (1960) that hemophiliacs frequently developed hemorrhages while exposed to emotionally stressful situations. While these studies lend support to an association between severity of bleeding episodes of hemophiliac children and stress, the authors fail to define "emotionally stressful situations" or "mild trauma," nor do they report statistical results.

Heisel et al. (1973) examined hemophiliac children who had higher life event scores than the average healthy child of the same age as measured by Coddington's (1972) life event scale. Since half of the 35 hemophiliac children in the study were classified as low bleeders (0-5 hemorrhagic episodes in one year), it could be expected that half of the high life change hemophiliacs would be low bleeders. Results of the study found that only one of the eleven hemophiliac children who scored high life changes was classified as a low bleeder (chi square = 7.36, p < 0.0.). Heisel and his associates concluded that the severity of bleeding episodes experienced by hemophiliac children is positively and significantly related to the magnitude of life change.

Stressful life situations have been related to the onset of manifest symptoms of juvenile diabetes mellitus (Stein & Charles, 1971). A group of adolescent diabetics was compared with a matched group of nondiabetic chronically ill adolescents. A significantly greater number of the diabetic group than the nondiabetic group suffered parental loss through separation, divorce or death, as well as experiencing more severe family disturbance. The authors conclude that a child, who is physically susceptible to diabetes mellitus and who is raised in a climate of emotional stress such as real or threatened parental loss, is susceptible to the development of the clinical manifestations of diabetes mellitus. The conclusions of Stein and

Charles are supportive of the earlier work of Hinkle et al. (1951) who documented the exacerbation of diabetes in association with stressful life situations.

Heisel (1972) explored the etiological role of life changes in juvenile rheumatoid arthritis. A modified form of Coddington's questionnaire was administered to 45 patients to measure the incidence and relative significance of certain events in the lives of children who have developed juvenile rheumatoid arthritis. Heisel concluded that children who develop this disease "tend to have recently experienced a cluster of changes in their world, higher in amount and intensity than the average child" (p. 415).

Heisel et al. (1973) examined the hypothesis that children suffering a variety of illnesses experience more significant life events preceding the onset of illness than is to be expected in a healthy population. The results of Heisel's study indicated that a significantly greater number of children, two to three times as many, in four patient groups (rheumatoid arthritis, general pediatrics, surgical patients and psychiatric patients) experienced more frequent and/or more severe life events prior to the onset of illnesses than did a healthy population of children.

The studies thus far reviewed have suggested that microbiologic data has only limited use in explaining how and why children become ill. For example, in over half of respiratory illnesses, complete cultures failed to yield an

etiologic agent in a study conducted by Boyce et al., 1977.

Other factors must be involved in the development of ill-

ness. Meyer and Haggerty (1962) reported a strong relation-

ship between streptococcal illness and the degree of chronic

family stress. Using Coddington's (1972) pediatric modifi-

cation of the Schedule of Recent Experience developed by

Holmes and Rahe (1967), Boyce et al. (1977) measured the

magnitude of life change in 58 children aged 1 to 11 years.

For one year each child was observed by teachers five days

per week for respiratory illness and a culture was obtained

at the onset of illness. In addition, each child underwent

biweekly nasopharyngeal culture for pathogenic bacteria.

Each illness was evaluated by a nurse practitioner or a

pediatrician. Multiple regression was used to analyze the

data. Two important relationships emerged. Life change

scores alone were significantly predictive of the average

duration of respiratory illness. When a family routine

variable was added to life change scores there was a

significant increase in the explained variance of the dura-

tion and frequency of subjects' respiratory illness.

Life change events have been associated with leukemia

in children (Greene & Miller, 1958). The results of Greene

and Miller's study suggested that experiences of loss and

separation are factors in the etiology of leukemia. Of the

33 subjects in this study who suffered with lymphocytic and

myelogenous leukemia, 31 had experienced one or more losses

or separations in the two-year period prior to illness onset. The events of loss or separation reported in this study (change of residence or school, death of a parent and separation from a grandparent) are identical to items that currently appear on Coddington's (1972) life event scale for children.

Jacobs and Charles (1980) have reported findings which support a relationship between childhood cancer and life change stress. Twenty-five cancer patients were compared with a matched group of twenty-five children who were brought to a medical facility for various reasons. When mean scores on the Schedule of Recent Experiences were compared for the two groups, the cancer patient subjects achieved a mean of 197.0 as opposed to the mean of 91.8 for the control group in the two years prior to the onset of cancer. This difference was significant at the $p < 0.001$ level of confidence. Again experiences of loss and separation dominated the events reported by the patient group. Further support for a relationship between childhood cancer and stress comes from research conducted by Wold (1968). The results of Wold's study demonstrated that a life crisis was present in the family at the time of onset of leukemia in children.

Although the preponderence of literature related to childhood stress and illness has been concerned with patient populations, Gitter-Cohen (1976) conducted a study involving

52 fourth, fifth and sixth grade students. Each student was administered the Significant Life Events Scale for Children and the Seriousness of Illness Rating Scale, modified for use with children. The population was then divided into two groups, a high scoring group and a low scoring group. No significant differences in seriousness or frequency of illness were found between the two groups. Thus, for a group of healthy children, Gitter-Cohen's study does not support a relationship between childhood stress and illness.

Rothman (1975) used the Schedule of Recent Experiences to measure stress in 52 mothers awaiting treatment for their children in a hospital emergency room. Twenty-six of the children had been brought in for treatment of accidental injuries and 26 for treatment of minor illnesses. Mothers of accident involved children reported more changes in their lives requiring a significantly greater adaptation to the stress than mothers of accident free children. Apparently stress may be related to the incidence of accidental injury as well as to illness in children, although the evidence to support such a conclusion is limited.

The concept of life events as stressors has also been related to psychological disorders (Brown & Birley, 1968; Brunch, 1972) and with behavioral difficulties (Justice et al., 1977). In adults the relationship between dysfunctional behaviors and stressful life events is supported by studies which report that periods of crisis often

precede serious criminal offenses (Szyrynski, 1968). Severe
stress has also been documented as a precipitating factor in
alcoholism (Jones, 1968). Justice and McBee (1977) found
that stressful life events were associated with both social
functioning and psychological difficulties in 39 adults
admitted as new outpatients at a mental health clinic. In a
study by Paykel et al. (1969), a group of depressed patients
had a much higher probability of experiencing certain life
events in a period 6 months prior to treatment than a
matched group of nonpatient controls from the general popu-
lation. Brown and Birley (1968) found in a study of adult
patients diagnosed as schizophrenic, that patients exper-
ienced nearly double the number of life events per person
when compared with a general population sample.

Consistent with the limited literature relating
stressful life events to physical illness in children, the
research into the relationship between psychological dis-
turbance and life stress in children is more limited than
that for adults. Sandler and Block (1977) hypothesized that
a group of primary school children identified by their
teachers and parents as having adjustment problems would
have experienced more recent stressful life events than
children in a matched control group. Recent life stress
events were found to be significantly positively correlated
with the adjustment problems of young children.

A crucial issue in Gersten's (1974) field of research is the characteristics of a life event which make that event stressful. Typically, a stressful event is thought to be something undesirable or threatening (Cofer & Appley, 1964). However, the work of Holmes and Rahe (1967), Dohrenwend and Dohrenwend (1970) and Froberg et al. (1971) introduced the concept that the primary characteristic in making an event stressful is change. Therefore, an event may be stressful if it requires some degree of change in an individual's usual activities regardless of the event's desirability or undesirability. Gersten et al. (1974) addressed this methodological concern in their study of children's behavior and stressful life events. Gersten and her associates evaluated measures of desirability/undesirability and measures of change in their study involving 674 children. The results indicated that the total change score was significantly correlated with the behavior ratings which included fighting and delinquency. However, the undesirable event score showed higher correlations with all of the behavior ratings, except fighting. The authors conclude that undesirability is the most important characteristic in making a life event stressful for children.

Research findings lend considerable support to a significant positive correlation between stressful life events and both physical illness and psychological disturbance. However, the correlation coefficients are usually

small and much of the variance in illness frequency and severity remains unexplained (Lin et al., 1979; Gersten et al., 1974; Rahe, 1975). Generally life event scales consistently yield scores related to illness. However, their predictive power is limited (Lin et al., 1979). Clearly then, other variables must be explored to more completely understand the stress-illness process.

Self Concept, Anxiety, Social Support, Stress and Illness

Sandler and Ramsey (1980) present a conceptual model of life stress events and illness based on the work of McGrath (1970). They state:

> . . . the role of life events as stressors can be understood to be a function of (a) the frequency of occurrence of events, (b) individual characteristics of people affected by the events (how they conceptualize and cope with events), and (c) social structures and resources affecting the individual's coping with events. (p. 299)

The relationship between the frequency of life events and illness in adults has been extensively reviewed in the literature. The limited research findings available offer support for a significant relationship between illness and stress in children. However, personal characteristics, such as self concept and trait anxiety, and social structures have received considerably less attention in research which has explored the stress-illness process.

Two personal characteristics which have received a great deal of attention in the literature are self concept and level of anxiety. However, there has been relatively little research done which has explored the role these variables play in the relationship between stress and illness.

Self concept is a phenomenon that has greatly interested researchers in both the behavioral sciences and education in recent years. Rogers (1961) defines self concept as a conscious sense developed by persons which defines who they are. Rogers' definition may be operationally defined as a set of interrelated self statements concerning personal characteristics and behavior (Videbeck, 1960). Coopersmith (1967) defines self concept as "an abstraction that an individual develops about the attributes, capacities, objects and activities he pursues" (p. 8). The primary source of such statements is hypothesized to be the reactions of other people to an individual (Rogers, 1961; Briggs, 1975). Parent-child interactions and other early experiences are assumed to be important in the development of the self concept (Piers, 1964). For children in elementary school, the sources of interpersonal exchanges include not only parents, but also siblings and a peer group.

Self concept has been studied in relationship to a number of variables including scholastic achievement (Brookover, 1964; Combs, 1964), interpersonal attraction (Cook,

1978; Austin, 1964; Goldman, 1976; Byrne, 1966), and perception of others (Galluzzi, 1977; Barnett, 1973; Richmond, 1972; Stock, 1949; Williams, 1962). Less attention has been directed toward examining the relationship between self concept and sociometric choice status. Several studies (Fry, 1955; McIntyre, 1952) have reported no significant relationship between self concept and acceptance by others. However, the majority of studies examining this relationship support a significant positive correlation between self concept and sociometric status. Several studies will be reviewed which have more recently explored the relationship between these two variables.

Guardo (1969) used a peer-nomination sociometric measure and the Piers-Harris Children's Self Concept to measure self concept in a study designed to explore the relationship between sociometric status and self concept in sixth graders. The results of this study suggest that a significant relationship exists between sociometric status and self concept. That is, children who measure high in self concept are more likely to receive more peer nominations of most popular and most liked, than children who score low on self concept measures. It is noted, however, that this relationship was stronger for sixth grade girls than for sixth grade boys.

In a study examining the relationship between sociometric status, self concept and anxiety, Horowitz (1962)

found consistent positive correlations between sociometric status and self concept for children in the fourth grade. No sex differences were found, although significant differences across grade levels were indicated. A significant positive correlation between self concept and sociometric status was found for fourth graders, but not for children in fifth and sixth grades. Horowitz points out that while a significant positive correlation between self concept and sociometric status was found for fourth grade children, it is a correlation of low magnitude.

Further support for the positive correlation between self concept and sociometric status is reported by Bradley and Newhouse (1975). The authors found highly significant differences in self concept between sixth grade children rated high on a sociometric measure and children rated low on the same measure. Children who received a greater number of choices of being liked the most also scored higher on the Piers-Harris Children's Self-Concept Scale. This research supports the work of Schmuck (1963) which reported that sociometric status appears to influence the school age child's self concept.

A curvilinear relationship between self concept and sociometric status was found by Reese (1961). He concludes that children in the moderate score range on a self concept measure experience the highest level of acceptance by others,

while the lowest level of acceptance was found among children with low self concept scores.

In summary, the body of research that examines the relationship between self concept and sociometric status generally suggests a significant positive relationship between these two variables. Discrepancies in the magnitude and nature of that relationship may be accounted for by differences in the operational definition of sociometric status and by the use of various instruments to measure self concept.

The concept of anxiety holds a central position in most theories of behavior and personality (Fisher, 1959). Although there is little agreement as to the nature of anxiety, there is a prevailing consensus of its significance in human behavior (Fisher, 1959). Researchers continually struggle not only with a theoretical definition, but also with an operational definition (Sarason, 1960).

Several definitions of anxiety have been provided by various authors. Weiss (1957) defines anxiety as "a specific, unpleasurable state of tension which indicates the presence of some danger to the organism" (p. 9). A similar definition is given by Laughlin (1956), "anxiety is the apprehensive tension or uneasiness which stems from the anticipation of imminent danger in which the source is largely unknown or unrecognized" (p. 9). Branch (1968) asserts that anxiety generally warns an individual that

something is wrong and functions to goad the individual into seeking out the source of danger so it can be eliminated. Kelly (1980) adds that anxiety is a subjective experience of apprehension or tension imposed by the expectation of danger or distress or the need for special effort. The subjective nature of anxiety is supported by Sullivan (1948) in his definition of anxiety as a reflection and warning of discrepancies in the self system originating internally. Sullivan further emphasizes a threat to each individual's need for security in his concept of anxiety.

These various definitions of anxiety serve to underscore the multidimensional nature of that phenomenon. While the various definitions vary, a few common elements seem apparent. The various definitions overlap on a few key aspects. Anxiety is an emotional state that is future directed and is accompanied by both subjective bodily discomforts and manifest bodily disturbances (Lewis, 1967).

Branch (1968) lists a number of physiological reactions to anxiety, including heart palpitations, tachycardia, sweating, pallor, urinary frequency, headaches, nausea and sleeplessness. He states that these symptoms may exist in individually varying degrees of intensity and in varying individual combinations. Branch analyzed the medical histories of patients who experienced anxiety and found a relationship between anxiety and a number of diseases

including: coronary disease, skin disorders, thyroid disease, obesity and gastrointestinal disorders.

The literature exploring anxiety in children is indeed vast. However, much of it is of a clinical or theoretical nature. It is therefore difficult to compare one study with another and thereby make generalizations about important variables which might affect the occurrence and consequences of anxiety.

A great number of studies have been conducted which have explored the relationship between self concept and anxiety in children. In almost every report a significant negative correlation between self concept and anxiety is indicated (Lewis & Adank, 1975; Many & Many, 1975; Felker, 1973; Suinn & Hill, 1964; Coopersmith, 1967). The most extensive study was conducted by Many and Many (1975) involving 4,367 children in grades four through eight. Their sample included children from a broad range of socioeconomic levels and various ethnic and racial minorities were adequately represented. Significant negative correlations were found between scores on Coopersmith's (1967) Self-Esteem Inventory and multiple measures of anxiety. No significant differences were reported between grade level or sex. McNelly (1972) stated, in a review of literature with regard to the relationship between self concept and anxiety,

Almost invariably the research has indicated
that there is a significant correlation

between manifest anxiety and a low self-
concept, even when different rating devices
are applied. (p. 14)

A survey of the literature has revealed a signifi-
cantly negative correlation between self concept and socio-
metric status and a significantly negative correlation
between anxiety and self concept. It would be logical to
assume then that anxiety and sociometric status are also
negatively correlated. The literature supports just such a
conclusion. High anxiety as measured by the Children's
Manifest Anxiety Scale was found to be related significantly
to low sociometric status among peers for children between
the ages of 10 and 12 (McCandless et al., 1956). Cowen et
al. (1965) used a discrepancy score between actual and ideal
self to measure self concept, total positive choices, total
negative choices and percentage of negative choices to
measure sociometric status and the Children's Manifest
Anxiety Scale to measure anxiety in 394 9 year old third
graders. The findings of this study included a significant
positive relation between anxiety and the total number of
negative choices and the percentage of negative choices, a
significant negative relation between anxiety and the total
number of positive choices and a significant negative cor-
relation between anxiety and self concept. Horowitz (1962)
reports similar results in his study of ill fourth, fifth
and sixth grade students. He concludes that the more
anxious child tends to have a poorer self concept and to be

less popular on sociometric measures than the less anxious child and the direction of the relationship is generally consistent between grades and sex.

Research findings support a significant positive correlation between self concept and sociometric choice status, a significant negative correlation between anxiety and self concept and a significant negative correlation between anxiety and sociometric choice status. How, then, do these variables impact the stress-illness relationship? Harris (1980) investigated the hypothesis that self concept and trait anxiety increase the efficiency of stress as a predictor of adult illness. He found that both trait anxiety and self concept increased the efficiency of stress as a predictor of illness. In fact, the cognitive mediating variables of trait anxiety and self concept were more efficient in predicting seriousness of illness than was the life events stress measure. No studies were found which explored self concept, anxiety and social support as they impact the stress-illness process. No studies were found which examined the hypothesis that self concept, anxiety and social support would increase the efficiency of stress as a predictor of children's illness.

Social Support and Illness

The relationship between stressful life events and psychological and physiological disorders has been well

documented (Sandler, 1980). However, the overall strength of that relationship has tended to be rather small, accounting for only approximately 10 percent of the variance in symptom scores (Andrews et al., 1978). It seems apparent then that while individuals who experience major life changes are at high risk to develop physical or psychological symptoms, the majority of such individuals do not develop serious disorders (Rabkin & Struening, 1976). In an effort to explain this phenomenon, Sandler (1980) hypothesized that personal characteristics of individuals exposed to a great many stressful events and the social-environmental conditions in which they live serve to moderate the negative effects of stressors.

Many researchers involved in studies that examine the stress-illness relationship suggest that social support is a factor which serves to buffer the negative consequences of stressful life events (Hirsch, 1980; Sandler, 1980; Gore, 1977; Dean & Lin, 1977; Andrews et al., 1978). The importance of social supports as a mediating factor in human behavior has been examined with respect to such issues as political elections, urban organizations, help-seeking behavior, hospital admissions, avowed happiness and personal crisis (Tolsdorf, 1976).

Cobb (1976) reviewed over 50 studies covering a variety of transitions in the life cycle from birth to death showing social support to be protective. Although a great

deal of diversity was found in terms of the criteria of support, which makes comparisons across studies difficult, Cobb concluded that the studies deal with a common phenomenon mediating the effects of stress. In her review of the literature which examines the role social support plays in the stress model of illness, Gore (1977) concluded there is ample evidence for the notion that the absence of adequate social supports, in the presence of high life change, increases an individual's susceptibility to various forms of disease. Both Cassell (1976) and Henderson (1977) have published reviews on a wide range of studies which suggest that the social support provided by primary groups serves to buffer or cushion the individual from the physiological or psychological consequences of exposure to stressful life events.

There does not appear to be one simple explanation of how social support short-circuits the illness response to stress. However, Caplan (1974) suggests that

> . . . significant others help the individual
> mobilize his psychological resources and
> master his emotional burdens; they share his
> tasks; and they provide him with extra sup-
> plies of money, materials, tools, skills and
> cognitive guidance to improve his handling of
> the situation. (p. 6)

Hirsch (1980) supports that conclusion by asserting that social support variables enhance successful coping with major life changes.

One of the problems that plagues research in social support, stress and illness is the lack of a consistent operational definition of social support. It is generally defined by Moss (1973) as "the subjective feeling of belonging, of being accepted, of being loved, of being needed all for oneself and not for what one can do" (p. 237). Gore (1977) conceptualizes support as the "met-ness" or gratification of a person's basic social needs, such as approval, esteem and succorance, from significant others. Cobb (1976) best summarizes these various definitions:

> Social support is defined as information leading the subject to believe that he is cared for and loved, esteemed and valued, and a member of a network of mutual obligations. (p. 300)

Social network is a term that has appeared in a number of studies and would seem to be a prerequisite for social support systems (Hirsch, 1980). A social network is defined by Mitchell (1969) as a "specific set of linkages among a defined set of persons . . ." (p. 2). Bott (1971) adds that a social network includes all or some of the social units, including individuals and groups, with whom a particular individual or group is in contact. Within this framework social support systems can then be measured with respect to a number of variables including marital status, club membership, church membership, the frequency of going out with others, having a close friend and living alone (Eaton, 1978).

A number of studies which involved adult populations have demonstrated the buffering effect of social support on the illness response to stress. de Araujo et al. (1973) examined the interaction of social support with life change with respect to the need for steroid therapy in adult asthmatics. Subjects with low life change scores required small dosages of steroids, while those with high life change and low social support required three to four times as many doses of steroids. The pattern is further substantiated with the finding that those subjects with high life change and high social support needed significantly fewer doses. Holmes (1970), using the same index of social support, found that measure to be highly predictive of the outcome of treatment for tuberculosis. In fact, all treatment failures fell within the lowest one-third of the social support scores. Nuckolls (1972) found that 91 percent of pregnant women with high life change scores and low social asset scores experienced one or more complications in their pregnancies or deliveries, while only 33 percent of the women with equally high life change scores, but with high social asset scores, had any complications. These studies lend support to the stress buffering role of social support with regard to physical illness in adults.

The moderating effect of social support on stressful life events is also demonstrated with regard to physiological measures of stress in a number of studies. Caplan (1972)

reports that for scientists, administrators and engineers employed by the National Space and Aeronautics Administration, good working relationships served to buffer occupational stressors. Role ambiguity, for example, was significantly correlated with elevations in serum coritsol only for persons experiencing poor interpersonal relations with co-workers. Gore (1977) found that men who had the emotional support of their wives while unemployed for several weeks had few illness symptoms, low cholesterol levels and did not blame themselves for the loss of the job. Those who were both unemployed and unsupported had the most disturbing health outcomes. In this study the support of wife and friends did not result in finding new employment any sooner, but the men who had support fared better with regard to their health.

Social support variables also seem to moderate stress effects on psychological impairment. Eaton (1978) found the effects of life events on psychiatric symptoms weaker for married subjects, as well as for those subjects living with others. The effect of stress was stronger for non-married subjects and strongest for those living alone. Marital status is a variable frequently considered in measures of social support. Myers (1962) found in his study that among subjects reporting many stressful life events, but experiencing few psychiatric symptoms, the level of social integration was higher than among people reporting

few events, but many psychiatric symptoms. He concluded that the socially integrated who have ready and meaningful access to others, have lower rates of psychiatric symptomatology. Lowenthal and Haven (1968) found, using a sample of 280 persons aged 63 and over, that 85 percent of those with low social interaction were depressed, while only 42 of those with high social interaction were depressed.

Not all studies are supportive of the stress buffering role of social support. Andrews (1978) found none of the social support variables in his study showed any mediating effect on the relationship between life event stress and psychological disorder. However, he did find that the social support variables were independently related to psychological impairment.

The literature provides very little data concerning social support, stressful life events and illness in children. Some research results have been interpreted cautiously by Cobb (1976) as providing evidence of the moderating role of social support on stressful life events. Stein and Susser (1967) identify toilet training as the first major social demand that a child encounters. The authors found control of bladder function at night to be significantly delayed for those children whose mothers went out to work while the children were 6-12 months of age. Forssman and Thuwe (1966) have shown that wanted children adapt to and cope with the stresses of growing up better than those whose

mothers requested and were denied an abortion. In addition, the wanted children were less frequently involved in juvenile delinquency and less frequently referred for psychiatric treatment than the initially unwanted children.

A study conducted by Sandler (1980) is particularly relevant to this study. Sandler administered measures of stress, behavior adjustment and social support to 99 children in kindergarten through third grade. Stress was measured using a modified version of Coddington's Social Readjustment Rating Questionnaire. Parents of the subjects completed the Louisville Behavior Check List (form E2) which measured behavior adjustment. Social support was evaluated in terms of the number of older siblings present in the home, the number of parents living in the home and the child's ethnic congruity in the neighborhood. The resulting pattern of correlations indicated a stronger relationship between stressful life events and adjustment problems when the resources of social support were absent than when they were present. The results strongly indicated the supportive role of older siblings.

This review of related literature provides a great deal of evidence that social support indeed seems to buffer the impact of stressful life events in the lives of adults. Adequate social supports appear to protect people in crisis from a wide variety of pathological states. Although the evidence is severely limited, research indicates that

possibly children may also benefit from social supports in the face of stressful life events.

Summary

The relationship between stress and illness has been well documented in a great many studies with adults. Although the research supports a positive relationship between stress and illness, authors of these studies note that the relationship is weak and recommend consideration of other factors which may impact the relationship. They suggest that cognitive, emotional, genetic and social variables may serve to heighten or lessen the impact of stress on physical health.

This study focused on possible cognitive factors, specifically anxiety and self concept and on one social factor, social support as mediators of the impact of stress on physical health in children. The literature review indicated that anxiety seems to have a high positive correlation with stress, but a strong negative correlation with self concept. The literature further suggests a significant positive correlation between self concept and sociometric status, one of the measures of social support used in this study.

Synthesis of the Research

The "stress-as-a-predictor of illness" model on which this study is based incorporates the suggestion by many researchers in the field that between stress and illness are factors which mediate the impact of stress. These factors may permit an individual to experience many stressful events and yet not suffer consequences in the form of physical illness. Conversely, a few stressful events may impact the physical health of another individual drastically. It was the intent of this study to examine possible mediating factors in relationship to stress in an effort to increase the efficiency of predicting illness in children.

This review of literature suggests that stress is related to specific illnesses in children. It was further suggested that self concept, anxiety and social support have some impact on the stress-illness relationship. It is the unique contribution of this study to examine the role self concept, anxiety and social support play in the efficiency of stress as a predictor of illness in healthy children.

CHAPTER BIBLIOGRAPHY

Andrews, G., Tennant, C., Hawson, D. M., & Viollant, G. E.
Life event, stress, social support, coping style and
risk of psychological impairment. Journal of Nervous
and Mental Disease, 1978, 166, 307-316.

Austin, M. C., & Thompson, G. G. Children's friendships: A
study of bases on which children select and reject best
friends. Journal of Educational Psychology, 1948, 39,
101-116.

Barnett, D. W., & Zucker, K. B. An exploration into chil-
dren's interpersonal behavior as related to their
perceptions of social interactions. Psychology in the
Schools, 1978, 10, 61-66.

Bott, E. Family and social networks. London: Tarristock
Publications, 1971.

Boyce, W. T. Influence of life events and family routines
on childhood respiratory tract illness. Pediatrics,
1977, 60, 609-615.

Bradley, F. D., & Newhouse, R. C. Sociometric choice and
self perceptions of upper elementary school children.
Psychology in the Schools, 1975, 12, 219-221.

Branch, C. H. Aspects of anxiety. 2nd ed. Philadelphia:
J. B. Lippincott Company, 1968.

Briggs, D. C. Your child's self-esteem. Garden City, New
York: Doubleday and Company, 1975.

Brookover, W. B., & Gottlieb, D. A sociology of education.
New York: American Book Company, 1964.

Brown, G. W., & Birley, J. L. T. Crises and life changes
and the onset of schizophrenia. Journal of Health and
Social Behavior, 1968, 9, 203-214.

Byrne, D., & Griffitt, W. A developmental investigation of
the law of attraction. Journal of Personal and Social
Psychology, 1966, 4, 699-703.

Cannon, W. B. Bodily changes in pain, hunger, fear and
rage. New York: D. Appleton and Company, 1929.

Caplan, R. D. Organizational stress and individual strain: A sociopsychological study of risk factors in coronary heart disease among administrators, engineers and scientists. Unpublished doctoral dissertation, University of Michigan, 1972.

Caplan, J. Support systems and community mental health. New York: Behavioral Publications, 1974.

Cassell, J. The contribution of the social environment to host resistance. American Journal of Epidemiology, 1976, 104, 107-123.

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

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children. Journal of Psychosomatic Research, 1972, 16, 1-18.

Coddington, R. D. The significance of live events as etiologic factors in the disease of children-II: A study of a normal population. Journal of Psychosomatic Research, 1972, 16, 205-213.

Cofer, C. N., & Appley, M. H. Motivation: Theory and research. New York: John Wiley and Sons, 1964.

Combs, C. Perception of self and scholastic underachievement in the academically capable. Personnel and Guidance Journal, 1964, 43, 47-51.

Cook, T. P. The relationship between self-esteem and interpersonal attraction in children. Journal of Genetic Psychology, 1978, 132, 149-150.

Coopersmith, S. The antecedents of self-esteem. San Francisco: W. H. Freeman and Company, 1967.

Cowen, E. L., Zax, M., Klein, R., Izzo, L. D., & Frost, M. A. The relation of anxiety in school children to school record, achievement, and behavioral measures. Child Development, 1965, 36, 685-695.

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

de Araujo, P. P. van Arsdel, Holmes, T. H., & Dudley, D. L. Life change, coping ability and chronic intrinsic asthma. Journal of Psychosomatic Research, 1973, 17, 359-363.

Dohrenwend, B. S., & Dohrenwend, B. P. Class and race as status related sources of stress. In S. Levine and N. A. Scotch (Eds.), Social stress. Chicago: Aldine Publishing Company, 1970, pp. 111-140.

Dohrenwend, B. S., & Dohrenwend, B. P. Stressful life events: Their nature and effects. New York: John Wiley and Sons, 1974.

Eaton, W. W. Life events, social supports and psychiatric symptoms: A re-analysis of the New Haven data. Journal of Health and Social Behavior, 1978, 19, 230-234.

Edwards, M. K. Life crisis and myocardial infarction. Unpublished Master of Nursing thesis, University of Washington, Seattle, 1971.

Felker, D. W., Stanwyck, D. J., & Kay, R. S. The effects of a teacher program in self-concept enhancement on pupils' self-concept, anxiety and intellectual achievement responsibility. Journal of Educational Research, 1978, 66, 443-445.

Fey, W. F. Acceptance by others and its relation to acceptance of self and others: A revaluation. Journal of Abnormal Social Psychology, 1955, 60, 274-276.

Fisher, W. F. Theories of anxiety. New York: Harper and Row Publishers, 1959.

Forssman, H., & Thuwe, I. One hundred and twenty children born after application for therapeutic abortion refused. Acta Psychiatry Scandanavia, 1966, 42, 71-88.

Froberg, J., Karlsson, C. G., Leui, L., & Lidberg, L. Physiological and biochemical stress reactions induced by psychosocial stimuli. In L. Leui (Ed.), Society, stress and disease: The psychosocial environment and psychosomatic diseases. New York: Oxford University Press, 1971, pp. 280-295.

Galluzzi, E. G., & Zucker, K. B. Level of adjustment and the self- and other-concepts. Psychology in the Schools, 1977, 14, 104-108.

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

Gitter-Cohen, B. J. The relationship of significant life events and physical illness in children. Unpublished doctoral dissertation, California School of Professional Psychology, 1978.

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

Greene, W. A., & Miller, G. Psychological factors and reticuloendothelial disease. Psychosomatic Medicine, 1958, 10, 124-144.

Guardo, C. J. Sociometric status and self-concept in sixth-graders. Journal of Educational Research, 1969, 62, 320-322.

Harris, J. L. Imagery, self-concept, anxiety and stress as predictors of seriousness of disease. Unpublished doctoral dissertation, North Texas State University, 1980.

Heisel, J. S. Life changes as etiological factors in juvenile rheumatoid arthritis. Journal of Psychosomatic Research, 1972, 16, 411-420.

Henderson, A. S. The social network, support and neurosis: The function of attachment in adult life. British Journal of Psychiatrics, 1977, 131, 185-191.

Hinkle, L. E., Jr. The effects of exposure to culture change, social change in interpersonal relationships on health. In B. Dohrenwend and B. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley, 1974.

Hirsch, B. J. Natural support systems and coping with major life changes. American Journal of Community Psychology, 1980, 8, 78-85.

Holmes, T., Stephenson & Holmes, T. H. Short-term intrusions into the life style routine. Journal of Psychosomatic Research, 1970, 14, 121-132.

Holmes, T. H., & Masuda, M.   Life change and illness suscep-
    tibility.   In B. S. Dohrenwend and B. P. Dohrenwend
    (Eds.), Stressful life events: Their nature and effects.
    New York: Wiley and Sons, 1974, pp. 45-72.

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

Horowitz, F. D.   The relationship of anxiety, self-concept
    and sociometric status among fourth, fifth and sixth
    grade children. Journal of Abnormal and Social Psy-
    chology, 1962, 65, 212-214.

Jacobs, T. J., & Charles, E.   Life events and cancer in
    children. Psychosomatic Medicine, 1980, 42, 11-24.

Justice, B., McBee, G. W., & Allen, R. H.   Life psychologi-
    cal distress and social functioning. Psychological
    Reports, 1977, 40, 467-473.

Kagan, A., & Levi, L.   Health and environment-psychosocial
    stimuli: A review. Social Science and Medicine, 1974,
    8, 225-241.

Kelly, D. Anxiety and emotions. Springfield, Illinois:
    Charles C. Thompson Publisher, 1980.

Laughlin, R. L. The neuroses in clinical practice.
    Philadelphia: Saunders, 1956.

Lewis, A.   Problems presented by the ambiguous word
    'anxiety' as used in psychopathology. Psychiatry, 1967,
    5, 105-110.

Lewis, J., & Adank, R.   Intercorrelations among measures of
    intelligence, achievement, self-esteem and anxiety in
    two groups of elementary school pupils exposed to two
    different models of instruction. Educational and Psy-
    chological Measurement, 1975, 35, 499-501.

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

Lowenthal, M. E., & Haven, C.   Interaction and adaptation:
    Intimacy as a critical variable. American Sociological
    Review, 1968, 33, 20-30.

Kagan, A. R. Epidemiology and society, stress and disease.
In L. Levi (Ed.), Society, stress and disease: The
psychosocial environment and psychosomatic disease.
London: Oxford University Press, 1971, pp. 36-48.

McCandless, B. R., Castaneda, A., & Palermo, D. D. Anxiety
in children and school status. Child Development,
1956, 27, 285-391.

McGrath, J. E. (Ed.). Social and psychological factors in
stress. New York: Holt, Rinehart and Winston, Inc.,
1970.

McIntyre, A., Lounsbury, K. R., Hamilton, M. L., & Mantooth,
J. M. Individual differences in preschool object play:
The influence of anxiety proneness and peer affiliation.
Journal of Applied Developmental Psychology, 1980, 1,
149-161.

McNelly, F. W. Development of self concept in children.
Ann Arbor: Michigan University. (ERIC Document Repro-
duction Service No. ED 086 318)

Many, M. A., & Many, W. A. The relationship between self-
esteem and anxiety in grades four through eight.
Educational and Psychological Measurement, 1975, 35,
1017-1021.

Mattsson, A., & Gross, S. Social and behavioral studies on
hemophiliac children and their families. Journal of
Pediatrics, 1966, 68, 952-961.

Meyer, A. The life chart and the obligation of specifying
positive data in psychopathological diagnosis. In
E. E. White (Ed.), The collected papers of Adolph Meyer.
Baltimore: The Johns Hopkins Press, 1951, pp. 52-56.

Meyer, R. J., & Haggerty, R. J. Streptococcal infections
in families. Pediatrics, 1962, 29, 539-549.

Mitchell, J. C. (Ed.). Social networks and urban situations.
Manchester: Manchester University Press, 1977.

Montgomery, L. E., & Finch, A. J., Jr. Validity of two
measures of anxiety in children. Journal of Abnormal
Child Psychology, 1974, 2, 293-298.

Moss, G. E. Illness, immunity and social interaction. New
York: John Wiley and Sons, 1973.

Myers, J. K., Lindenthal, J. J., & Pepper, M. P. Life events and psychiatric impairments. Journal of Nervous and Mental Disease, 1971, 152, 149-157.

Nuckolls, C., Cassell, J., & Kaplan, B. Psychosocial assets, life crises and the prognosis of pregnancy. American Journal of Epidemiology, 1972, 95, 431-441.

Paykel, E. S., Myers, J. K., Dunett, M. H., Klerman, G. L., Linderthal, J. J., & Pepper, M. P. Life events and depression. Archives of General Psychiatry, 1969, 21 753-760.

Piers, E. V., & Harris, D. B. Age and other correlates of self-concept in children. Journal of Educational Psychology, 1964, 55, 91-95.

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

Rahe, R. H. Life-change measurement as a predictor of illness. Proceedings of the Royal Society of Medicine, 1968, 61, 1124-1126.

Rahe, R. H., & Lord, E. Psychosocial factors and sudden cardiac death: A pilot study. Journal of Psychosomatic Research, 1971, 15, 19-24.

Rahe, R. H., & Paasikui, J. Psychosocial factors and myo-cardial infarction II: An out-patient study in Sweden. Journal of Psychosomatic Research, 1971, 15, 33-39.

Rahe, R. H. Subjects' recent life changes and their near-future illness reports: A review. Annals of Clinical Research, 1972, 4, 393-397.

Rahe, R. H. Epidemiological studies of life change and ill-ness. International Journal of Psychiatry and Medicine, 1975, 6, 133-146.

Reese, H. W. Manifest anxiety and achievement test per-formance. Journal of Educational Psychology, 1961, 52, 132-135.

Richmond, B. O., & White, W. F. Sociometric predictors of the self-concept among fifth and sixth grade children. Journal of Educational Research, 1971, 64, 425-429.

Rothman, L. Vulnerability of children to accidental injury as related to family system stress, mother's coping skill and the behavioral style of the accident-involved child. Unpublished doctoral dissertation, California School of Professional Psychology, 1976.

Rubin, R. T., Gunderson, E. K. E., & Arthur, R. J. Life stress and illness patterns in the U.S. Navy. III. Prior life change and illness onset in an attack carrier's crew. Archives of Environmental Health, 1969, 19, 753-757.

Sandler, I. Life stress and maladaptation of children. American Journal of Community Psychology, 1979, 7, 425-440.

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

Sandler, I. N., & Block, M. Life stress and maladaptation of children. American Journal of Community Psychology, 1979, 7, 425-440.

Sandler, I. N., & Ramsey, T. B. Dimensional analysis of children's stressful life events. American Journal of Community Psychology, 1980, 8, 285-302.

Sarason, S. B., Davidson, K. S., Lighthall, F. F., Waite, R. R., & Rucbush, B. K. Anxiety in elementary school children. New York: John Wiley and Sons, Inc., 1960.

Selye, H. The evolution of the stress concept--stress and cardiovascular disease. In L. Levi (Ed.), Society, stress and disease: The psychosocial environment and psychosomatic disease. London: Oxford University Press, 1971, pp. 299-344.

Sheridan, M. S., & Kline, K. Psychosomatic illness in children. Social Casework, 1978, 59, 227-232.

Spielberger, C. D., Gorsuch, R. L., & Lushine, R. F. The State-trait Anxiety Inventory Test Manual Form X. Palo Alto, California: Consulting Psychologists Press, 1970.

Spielberger, C. D. Anxiety: Current trends in theory and research. New York: Academic Press, 1972.

Spielberger, C. D. Manual for the State Trait Anxiety Inventory for Children. Palo Alto, California: Consulting Psychologists Press, 1973.

Stein, S. P., & Charles, E. Emotional factors in juvenile diabetes melliture: A study of early life experiences of adolescent diabetics. American Journal of Psychiatry, 1971, 128, 56-60.

Stein, Z., & Susser, M. Social factors in the development of spincter control. Developmental Medicine and Childhood Neurology, 1967, 9, 692-706.

Stock, D. An investigation into the interrelations between the self concept and feelings directed toward other persons and groups. Journal of Consulting Psychology, 1949, 13, 176-180.

Suinn, R. M., & Hill, H. Influence of anxiety on the relationship between self-acceptance and acceptance of others. Journal of Consulting Psychology, 1964, 28, 116-119.

Sullivan, H. S. The interpersonal theory of psychiatry. New York: Norton, 1953.

Theorell, T. Psychological factors in relation to the onset of myocardial infarction and to some metabolic variables. Stockholm: Academic Thesis, Karolinska Institute, 1970.

Theorell, T., & Rahe, R. H. Psychosocial factors and myocardial infarction: An inpatient study in Sweden. Journal of Psychosomatic Research, 1971, 15(1), 25-31.

Theorell, T., Lind, E., Froberg, J., Karlsson, C. G., & Levi, L. A longitudinal study of 21 subjects with coronary heart disease: Life changes, catecholamine excretion and related biochemical reactions. Psychosomatic Medicine, 1972, 34, 505-516.

Thurlow, H. J. Illness in relation to life situations and sick-role tendency. Journal of Psychosomatic Research, 1971, 15, 73-88.

Tolsdorf, C. Social networks, support and coping: An exploratory study. Family Process, 1976, 15, 407-417.

Videbeck, R. Self-conception and the reaction of others. Sociometry, 1960, 23, 351-359.

Weiss, E., Dlin, B., Rollin, H. R., Fischer, H. K., & Bepler, C. R. Emotional factors in coronary occlusion. Archives of Internal Medicine, 1957, 99, 628-641.

Williams, J. E. Acceptance of others and its relationship to acceptance of self and others. A repeat of Fey's study. Journal of Abnormal and Social Psychology, 1962, 65, 438-442.

Chapter III

METHODS AND PROCEDURES

Organization of the Study

Prior to the collection of data, a brief description
of the study and the instruments to be used were sent to the
Director of Elementary Education and to the Director of
Research of the school system from which subjects were to be
selected. Following reception of written permission from
these individuals to conduct the study, the investigator
secured approval from teachers and principals to use their
students as subjects. A letter (Appendix D) was sent to
each teacher participating in the study explaining the pro-
cedures for collecting data. After the data were collected,
an analysis was made at the North Texas State University
Computing Center.

Theoretical Basis for the Study

Studies exploring the biophysical and psychosocial
effects of stress have come from such diverse fields as psy-
chology, internal medicine, sociology and anthropology (Cox,
1978). Having received such wide attention in the litera-
ture, the concept of stress is familiar to lay persons and
professionals alike.

Kagan and Levi (1971) constructed a theoretical model to describe psychological factors which mediate the relationship between stress and physical illness. Their research indicates that most life changes evoke a physiological stress response. This response, if prolonged, intense or frequently repeated tends to result in structural as well as functional damage to one or more systems of the body.

Within this model, external influences or psychosocial stimuli, interact with genetic factors and with influence of earlier learning. These personal factors, Kagan and Levi term the "psychobiological programme." Little emphasis is placed on an individual's perceptual factors.

In 1976 Lazarus developed what may be described as an interactional model of stress. It is a model that facilitates the exploration of the relationship between external conditions, including life events, and biophysical and psychosocial disorders. Lazarus emphasizes that stress depends not only on external stimuli, such as life events, but also on the individual's cognitive appraisal of his or her situation. If the individual perceives stress and also believes his or her capabilities to be inadequate to the demands, then psychological and physiological responses occur, including physical disease.

A model similar to Lazarus', developed by Cox et al. (1978), conceptualizes stress as "a complex and dynamic system of transaction between the person and his environment" (p. 18). Five stages are identified in this interactional process. The first stage is represented by both internal and external demand. The person's perception of the demand and of his or her ability to meet the demand constitute the second stage. If an imbalance is perceived between demand and ability to cope then physiological changes occur, accompanied by cognitive and behavioral attempts to reduce the stressful nature of the demand, forming the third stage. The fourth stage is comprised of the consequences of the coping responses, both actual and perceived. The fifth stage involves feedback to the perception of demand and coping abilities. The emphasis thus remains on the individual's cognitive appriasal of the potentially stressful situation and his or her ability to cope.

Cox et al. (1976) summarize this interactional concept of stress,

> Stress, it is argued, can only be sensibly defined as a perceptual phenomenon arising from a comparison between the demand on the person and his ability to cope. An imbalance in this mechanism, when coping is important, gives rise to the experience of stress, and to stress response. The latter represent attempts at coping with the source of stress. Coping is both psychological (involving cognitive and behavioral strategies) and physiological. If normal coping is ineffective, stress is prolonged and abnormal

responses may occur. The occurrence of these, and prolonged exposure to stress per se, may give rise to functional and structural damage. The progress of these events is subject to great individual variation. (p. 25)

In summary, the model of stress used in this study examines the interaction of specific processes and variables in the evolution of illness. External events in an individual's life are first perceived and interpreted. This process is influenced by genetic factors, early learning and present cognitive appraisal. This process of evaluation is influenced by whether or not the individual typically responds in an anxious manner, trait anxiety, their present level of tension, state anxiety, and how those individuals perceive themselves, self concept. In addition, the process of cognitive appraisal will be influenced by the individual's support resources in the social environment, specifically availability of parents, siblings and friends. If the event is then perceived to be dangerous or threatening, physiological and psychological responses will occur. If these responses are prolonged, illness will be a frequent consequence (Kagan & Levi, 1971; Lazarus, Cox, & Mackay, 1978; Harris, 1980).

In relation to this model, this study employed the Social Readjustment Rating Questionnaire (Appendix A) as a measure of life change, the State-trait Anxiety Inventory for Children, the Piers-Harris Children's Self-concept Scale, the number of parents and siblings living in the

home and the number of choices received on a sociometric test as measures of the variables involved in the cognitive appraisal process. The Seriousness of Illness Rating Scale (Appendix B) was adapted to measure illness in children used as subjects in this study.

Instruments

The State-trait Inventory for Children (STAIC) was developed by Spielberger (1973) as an extension of the State-trait Inventory. It is designed to yield two scores, state anxiety and trait anxiety. Endler (1979) refers to this instrument as the best scale available for assessing anxiety in children. Test-retest reliabilities for trait anxiety are .65 for males and .71 for females; coefficients for state anxiety are .31 for males and .47 for females. Internal consistency reliability coefficients for state anxiety are .82 for males and .87 for females; the coefficients for state anxiety are .78 for males and .81 for females (Spielberger, 1973). It appears that the internal consistency of the STAIC is adequate but the test-retest reliability is questionable.

Construct validity was established by studies which demonstrated that the STAIC is not a good predictor of either aptitude or achievement. Concurrent validity is based on correlations between the STAIC trait anxiety scale

and the Children's Manifest Anxiety Scale (CMAS). For a
sample of 75 children, the STAIC trait anxiety scale cor-
related .75 with the Children's Manifest Anxiety Scale
(Spielberger, 1973). Endler (1979) recommends the use of
STAIC in research over the use of the Children's Manifest
Anxiety Scale based on its adequate norms, adequate reli-
ability and moderate validity.

Montgomery and Finch (1974) report a study involving
60 emotionally disturbed children in which the predictive
validity of the CMAS and the STAIC was investigated. It was
hypothesized that emotionally disturbed children would score
significantly higher on these measures of anxiety than would
normal children. The researchers report a significant cor-
relation between state anxiety scores and the CMAS scores
$(r = .47, p<.001)$ and between trait anxiety scores and the
CMAS scores $(r = .52, p .001)$ lending support to the validity
of both instruments. The magnitude of this correlation
also suggests that the CMAS measures a more general or
chronic state of anxiety and does not discriminate between
state anxiety and trait anxiety as does the STAIC
(Montgomery & Finch, 1974).

The Social Readjustment Rating Qeustionnaire was
developed by Coddington (1972) as a measure of stress in
children. He adapted the procedure used by Holmes and Rahe
(1967) to develop their Social Readjustment Rating Scale.
Coddington derived his list of life events from the literature

and from his experience in working with children. The life event items were divided into four lists according to age: (1) preschool age, (2) elementary age, (3) junior high school age, and (4) high school age.

The items on each list were ordered by 243 professionals with experience in working with children using the method for ordering developed by Holmes and Rahe (1967). The ordering done by these professionals was broken down by profession, sex, religion, marital status and years of experience. All of the correlations were in excess of .90 (Coddington, 1972).

The Social Readjustment Rating Questionnaire has been the instrument of choice for measuring stress in children in many recent studies (Sandler & Ramsey, 1980; Gersten et al., 1977), probably because it is the only objective measure of stress available for children. It has been found effective in exploring the relationship between stress and maladaptive behavior in children (Sandler & Ramsey, 1980p Gersten et al., 1977).

Coddington (1972) has established age norms based on a survey of over 3,500 healthy children and found no differences occurred between sexes, races or members of different social classes. He did find that younger children experience fewer events, but this increase occurred across all subgroups.

The Seriousness of Illness Rating Scale was developed by Wyler et al. (1970) to study the relationship of life

change to onset of illness. The scale consists of 126 items which are rank ordered along a continuum of least serious to most serious. Initially the 126 items were sent to two groups of physicians for rank ordering. Spearman's rank order correlation coefficient was used to compare the rank orders of the two groups. Spearman's rho was significant at .988. The Man-Whitney U test was used to test for significant differences in ranking between the two groups. No significant differences were found at the .05 level (Wyler et al., 1970). Wyler concluded that the Seriousness of Illness Rating Scale is a reliable measure of physicians' estimations of the seriousness of illness.

The Seriousness of Illness Rating Scale (SIRS) was administered to 313 first year college students along with four other measures of seriousness of illness (Garrity, Marx & Somes, 1978). The four additional measures included the number of days each health problem was experienced, the number of days that each health problem interfered with engaging in normal activities, a subjective evaluation of the magnitude of each health problem and a subjective evaluation of overall health. Garrity, Marx and Somes (1978) found that the SIRS significantly correlated at beyond the .01 level to each of the other four measures of health. The authors concluded that the SIRS does indeed relate to a dimension of illness seriousness and severity (Garrity, Marx & Somes, 1978).

There is no instrument available for measuring seriousness of illness in children. For the purposes of this study, the Seriousness of Illness Rating Scale was sent to three pediatricians practicing in Denton, Texas. They were asked to delete items not applicable to diagnosing illness in children (Appendix C). Only those items identified as not applicable to children by all three pediatricians were deleted from the scale. The following items were deleted from the SIRS on the basis that all three pediatricians surveyed identified them as not applicable to diagnosing illness in children: dandruff, corns, menopause, bed sores, varicose veins, no menstrual periods, lumbago, abortion, gonorrhea, frigidity, sexual deviation, syphilis, hardening of the arteries and emphysema.

In scoring the Seriousness of Illness Rating Scale, specific weights related to the ranking of each item were available (Garrity, Marx & Somes, 1978). The deletion of items from the SIRS may affect the weighting of items in some way unknown to this researcher. Therefore, the frequency with which each illness occurred was summed for each subject as the measure of illness in this study.

Sociometric testing is a measure of interpersonal association based on a specific choice criteria (Bonney, 1981). Two criteria were used in the sociometric test in this study: (1) Who would you choose to be with you in a play group? and (2) Who would you choose to be with you in a

work group? No limit was set on the number of choices a child could make. Choices were limited to other children present in the classroom on the day of testing. Scores were recorded for the total number of choices received on both criteria. This sum served as the measure of a child's social support system in the school setting.

The Piers-Harris Children's Self Concept Scale (CSCS) consists of 80 declarative statements about self, half of which indicate a negative self concept and half of which indicate a positive self concept. The child responds "yes" or "no" to each statement. This is a well-known test and has been widely used in experimental research (Buros, 1979).

The scale was standardized on 1,000 children in grades 4-12 and norms are provided for each grade level. No consistent sex or grade differences appear in the means. Internal consistency ranges from .78 to .93 and test-retest reliability from .71 to .77 (Buros, 1978). Bentler (1978) suggests the test-retest coefficient may be higher since a rather lengthy two-and-four-month test-retest interval was used to establish reliability.

Concurrent validity is judged to be adequate (Buros, 1979). Correlations with similar instruments are in the mid-sixties. The scale does not correlate well with social desirability; however, quite high correlations, -.54 to -.69, exist with a measure of anxiety. The authors believe this

correlation represents a true trait correlation, rather than one of response style (Bentler, 1978).

Both reliability and validity are judged to be adequate. Bentler (1978) recommends use of the Piers-Harris Self Concept Scale in research.

Population and Subjects

The population sample was a public school system with a total enrollment between 24,000 and 25,000 students. The sample consisted of a nonrandom selection of five fourth grade classrooms with a total enrollment of 138. Thirty-eight students were not included in the study due to their parents' reluctance or failure to return the scales and permission form or due to the child's absence on the day of testing, leaving a sample size of 100. All subjects were 9 or 10 years of age, of which 55 percent were males and 45 percent were females. Few minority students were in the sample. The proportion of Black citizens in the population of the midwestern city in which the study was conducted comprise approximately 5 percent of the total population. Other racial and ethnic populations represent less than 1 percent of the city's total population.

Procedures for Data Collection

Two weeks prior to conducting the classroom testing, a letter (Appendix D) containing an explanation of the

procedures to be followed in the study, an explanation of the instruments to be administered and copies for each student of the Social Readjustment Rating Questionnaire, the Seriousness of Illness Rating Scale and a letter to parents (Appendix E) was sent to each of the five participating teachers. One week prior to testing, teachers sent home with each of their students the letter to parents explaining the study and requesting permission for their child to participate, along with the Social Readjustment Rating Questionnaire and the Seriousness of Illness Rating Scale. Parents were asked to complete the two scales and return them to their child's classroom teacher. A follow-up note was sent two days later to parents who had not yet returned the forms. Two days prior to the classroom testing, teachers were contacted to obtain the completed scales and permission forms. At the same time, an appointment was established to complete the classroom testing.

Classroom testing was completed in one 45-minute session for each classroom during the second week in May, 1982. Classroom testing included administration of the Piers-Harris Children's Self Concept Scale, the State-trait Anxiety Scale for Children and the Sociometric testing. Students were blind to the purpose of the study.

Procedures for Data Analysis

After the data were collected, the measures were hand
scored and keypunched onto appropriate cards. The North
Texas State University Computing Department analyzed the
data using correlations between the variables and a test for
the significance of each correlation. Multiple linear
regression was employed using the following model by Harris
(1980):

$$Y = a_1X_1 + a_2X_2 + \cdots a_{10}X_{10} + E$$

when X_1 = the number of choices received on a sociometric
measure

when X_2 = the number of siblings living in the home

when X_3 = the number of parents living in the home

when X_4 = scores on the <u>State-trait Anxiety Inventory for</u>
<u>Children</u>

when X_5 = scores on the <u>Social Readjustment Rating</u>
<u>Questionnaire</u>

when X_6 = scores on the <u>Piers-Harris Children's Self</u>
<u>Concept Scale</u>

Y   = scores on the <u>Seriousness of Illness Rating Scale</u>

For further analysis the following vectors were included:

X_7 = a combination of X_1 times X_6

X_8 = a combination of X_2 times X_6

X_9 = a combination of X_3 times X_6

X_{10} = a vector discriminating males from females

Restrictions were drawn upon this model in order to test the hypotheses. The first five hypotheses were tested using the initial correlation matrix. The basic model for hypothesis six and for all following hypotheses is $Y = X_5$. Using this as the basic model, the hypotheses were tested using the following models:

Hypothesis 6 $Y = X_5 + X_4 + E$

Hypothesis 7 $Y = X_5 + X_6 + E$

Hypothesis 8 $Y = X_5 + X_1 + E$

                       $Y = X_5 + X_2 + E$

                       $Y = X_5 + X_3 + E$

Hypothesis 9 $Y = X_5 + X_{10} + E$

Hypothesis 10 $Y = X_5 + X_7 + X_1 + X_6 + E$

                       $Y = X_5 + X_8 + X_2 + X_6 + E$

                       $Y = X_5 + X_9 + X_3 + X_6 + E$

Hypothesis 11 was tested by selecting as the initial predicting variable, the variable with the highest correlation with seriousness of illness. Each variable then selected was selected on the basis that it should contribute to the largest increase in R^2 compared to all other variables left out of the model. Variables were then added, one at a time in a stepwise manner, to find the fewest and most efficient predictors.

CHAPTER BIBLIOGRAPHY

Bentler, P. M. In O. K. Buros (Ed.), The seventh mental measurement yearbook (Vol. 2). Highland Park, New Jersey: Gryphon Press, 1972, 7, 124.

Bonney, M. E. Personal Communication, 1981.

Buros, O. K. The eighth mental measurements yearbook (Vol. 1). Highland Park, New Jersey: Gryphon Press, 1978.

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children. Journal of Psychosomatic Research, 1972, 16, 1-18.

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children - II: A study of a normal population. Journal of Psychosomatic Research, 1972, 16, 205-213.

Cox, T. Stress. Baltimore: University Park Press, 1978.

Endler, N. S. In O. K. Buros (Ed.), The eighth mental measurements yearbook (Vol. 1). Highland Park, New Jersey: Gryphon Press, 1979, 8, 684.

Garrity, T. F., Marx, M. B., & Somes, G. W. The relationship of recent life change to seriousness of later illness. Journal of Psychosomatic Research, 1978, 22, 7-11.

Gersten, J. C., Langer, T. S., Eisenberg, J. G., & Simcha-Fagan, O. An evaluation of the etiologic role of stressful life-events in psychological disorders. Journal of Health and Social Behavior, 1977, 18, 228-244.

Harris, J. L. Imagery, self-concept, anxiety, and stress as predictors of seriousness of disease. Unpublished doctoral dissertation, North Texas State University, 1980.

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

Kagan, A., & Levi, L. Health and environment-psychosocial stimuli: A review. Social Science and Medicine, 1974, 8, 225-241.

Lazarus, R. S. Psychological stress and the coping process. New York: McGraw-Hill, 1966.

Montgomery, L. E., & Finch, A. J., Jr. Validity of two measures of anxiety in children. Journal of Abnormal Child Psychology, 1974, 2, 293-298.

Sandler, I. N., & Ramsey, T. B. Dimensional analysis of children's stressful life events. American Journal of Community Psychology, 1980, 8, 285-302.

Spielberger, C. D. Manual for the State-Trait Anxiety Inventory for Children. Palo Alto, California: Consulting Psychologists Press, 1973.

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

Chapter IV

PRESENTATION AND ANALYSIS
OF THE DATA

Chapter IV presents the results of the data analysis with regard to each hypothesis under investigation in this study. The hypotheses were restated in the null form for the purpose of statistical analysis. A level of significance of .05 was established as the criterion for either retaining or rejecting each hypothesis. Hypotheses 1 through 5 investigated the correlations among the variables and were presented in the null form as follows.

1. There will be no significant correlation between stressful life events and illness in children as determined by scores on the Social Readjustment Rating Questionnaire and the Seriousness of Illness Rating Scale.

2. There will be no significant correlation between stressful life events and trait anxiety in children as determined by scores on the Social Readjustment Rating Questionnaire and the State-trait Anxiety Inventory for Children.

3. There will be no significant correlation between stressful life events and self concept in children as determined by scores on the Social Readjustment Rating

Questionnaire and the Piers-Harris Children's Self-Concept Scale.

4. There will be no significant correlation between stressful life events and social support in children as determined by the Social Readjustment Rating Questionnaire and

    a. the number of choices received on a sociometric measure,

    b. the number of siblings living in the home, and

    c. the number of parents living in the home.

5. There will be no significant correlation between anxiety and self concept in children as determined by scores on the State-trait Anxiety Inventory for Children and the Piers-Harris Children's Self-Concept Scale.

Means and standard deviations for each of the variables tested in this study are shown in Appendix F.

Table I presents Pearson product moment correlation coefficients for the appropriate variables along with levels of significance which were computed using a t test to determine if the correlation departed significantly from zero. For clarity the abbreviations used for the instruments are as follows:

    a. Seriousness of Illness Rating Scale (SIRS)

    b. Piers-Harris Children's Self-Concept Scale (CSCS)

Table I

A Matrix of Correlational Values and
Significance Levels Among
Variables Examined

Variables	SIRS	SRRQ	CSCS	STAIC	PEER CHOICES	SIBLINGS	PARENTS
SIRS	1						
SRRQ	.25 **	1					
CSCS	.01	-.17 *	1				
STAIC	.05	.12	-.72 ***	1			
PEER CHOICE	-.24 **	-.04	.18 *	-.12	1		
SIBLINGS	-.05	-.02	-.08	.00	.15	1	
PARENTS	-.08	-.11	-.04	.08	.11	.18	1
SEX	-.11	-.16	.18 *	-.19 *	-.16	.19	-.13

*p < .05
**p < .01
***p < .001

c.   State-trait Anxiety Inventory for Children
(STAIC)

d.   Social Readjustment Rating Questionnaire (SRRQ)

e.   Number of choices received on a sociometric
measure (PEER CHOICE)

f.   Number of siblings living in the home (SIBLINGS)

g.   Number of parents living in the home (PARENTS)

h.   An interaction between CSCS and PEER CHOICE will
be CSCS/PEER CHOICE

i.   An interaction between CSCS and SIBLINGS will be
CSCS/SIBLINGS

j.   An interaction between CSCS and PARENTS will be
CSCS/PARENTS.

The correlation between stress scores (SRRQ) and
seriousness of illness scores (SIRS) was .25 which was sig-
nificant at beyond the .01 level of confidence. Therefore,
null hypothesis 1 was rejected.

The correlation between stress scores (SRRQ) and
trait anxiety scores (STAIC) was .12 which was not signifi-
cant. Therefore, null hypothesis 2 was retained.

The correlation between stress scores (SRRQ) and
self concept scores (CSCS) was -.17 which was significant at
the .05 level of confidence. Therefore, null hypothesis 3
was rejected.

The correlations between stress scores (SRRQ) and
the three measures of social support were as follows:

a. PEER CHOICES correlated at -.04 which was not significant at the .05 level of confidence;

b. SIBLINGS correlated at -.02 which was not significant at the .05 level of confidence;

c. PARENTS correlated at -.11 which was not significant at the .05 level of confidence.

Therefore, null hypotheses 4a, 4b and 4c were retained.

The correlation between trait anxiety scores (STAIC) and self concept scores (CSCS) was -.72 which was significant at beyond the .001 level of confidence. Therefore, null hypothesis 5 was rejected.

Hypotheses 6-11 examined the efficiency of predicting seriousness of illness scores using specified variables and were restated in the null form as follows:

6. Using as the basic model stress (SRRQ) as a predictor of illness in children (SIRS), no significant increase in R^2 will be obtained when trait anxiety (STAIC) is added to the model.

7. Using as the basic model stress (SRRQ) as a predictor of illness in children (SIRS), no significant increase in R^2 will be obtained when self concept (CSCS) is added to the model.

8. Using as the basic model stress (SRRQ) as a predictor of illness in children (SIRS), no significant increase in R^2 will be obtained when social support is added to the model. Social support will be determined by:

a. the number of choices received on a socio-metric measure (PEER CHOICE),

b. the number of siblings living in the home (SIBLINGS),

c. the number of parents living in the home (PARENTS).

9. Using as the basic model stress (SRRQ) as a predictor of illness in children (SIRS), no significant increase in R^2 will be obtained when a vector discriminating sex is added to the model.

10. Using as the basic model stress (SRRQ) as a predictor of illness in children, no significant increase in R^2 will be obtained when a multiplicative combination of self concept (CSCS) and social support is added to the model. That is, there will be no significant interaction between self concept (CSCS) and social support. Social support will be determined by:

a. the number of choices received on a socio-metric measure (PEER CHOICE),

b. the number of siblings living in the home (SIBLINGS),

c. the number of parents living in the home (PARENTS).

11. The most efficient model in predicting illness in children (SIRS) will not include stress (SRRQ) and some

combination of anxiety (STAIC), self concept (CSCS) and

social support (PEER CHOICE, SIBLINGS,PARENTS).

Table II

Significance of Increase in R^2 Adding Each Variable
Alone to Life Stress as Predictors of
Seriousness of Illness

Variables	Multiple R	R^2	Increase R^2	d/f	F
SRRQ	.245	.060	---	1/98	6.30*
STAIC	.247	.061	.001	1/97	0.06
CSCS	.250	.062	.002	1/97	0.25
PEER CHOICE	.337	.113	.053	1/97	5.82*
SIBLINGS	.252	.063	.003	1/97	0.35
PARENTS	.251	.063	.003	1/97	0.28
SEX	.257	.066	.006	1/97	0.59

* F = 3.94   p < .05 with 1/100 df

Table II summarizes the results of adding a vector
representing each variable under consideration in this study
to a vector representing scores on the Social Readjustment
Rating Questionnaire as predictors of scores on the
Seriousness of Illness Rating Scale. Each vector was added
individually to the basic model, stress as a predictor of
illness, in an effort to increase the predictability of ill-
ness in children. A vector representing each variable under
study was added, one at a time, then dropped from the model
and another vector representing another variable was added
in order to find the unique contribution to R^2 provided by

each variable. This method provided a test for hypotheses 6-9. In Table II, the R^2 increase represents the square of the semipartial correlation coefficient for each variable. Scores on the SRRQ predicting scores on the SIRS was the basic model. SRRQ scores alone were significant predictors of SIRS scores with a multiple R of .245 which accounted for 6 percent of the variance in SIRS scores and was significant at beyond the .05 level of confidence.

There was no significant increase in R^2 when trait anxiety scores (STAIC) were added to life event stress scores (SRRQ) as predictors of children's seriousness of illness scores (SIRS). The multiple R was .247 which accounted for 6.1 percent of the variance in SIRS scores, an increase in R^2 of .001. This increase was not significant at the .05 level of confidence. Therefore, null hypothesis 6 was retained.

The partial regression coefficients for this model were: SRRQ was .243; STAIC was .025 with a constant of 14.892. In this model, SRRQ scores alone were as accurate in predicting SIRS scores as were SRRQ scores and STAIC scores.

There was no significant increase in R^2 when self concept scores (CSCS) were added to life event stress scores (SRRQ) as predictors of children's seriousness of illness scores (SIRS). The multiple R was .250 which accounted for 6.2 percent of the variance in SIRS scores, an

increase in R^2 of .002. This increase was not significant at the .05 level of confidence. Therefore, null hypothesis 7 was retained.

The partial regression coefficients for this model were: SRRQ was .254; CSCS was .050 with a constant of 13.455. Again, SRRQ scores were as efficient in predicting SIRS scores as SRRQ scores combined with CSCS scores.

There was a significant increase in R^2 when peer choices received (PEER CHOICE) were added to life event stress scores (SRRQ) as predictors of children's serious-ness of illness scores (SIRS). The multiple R was .337 which accounted for 11 percent of the variance in SIRS scores, an increase in R^2 of .053. This increase was sig-nificant at beyond the .05 level of confidence.

The partial regression coefficients for this model were: SRRQ was .237; PEER CHOICE was -0.231 with a con-stant of 24.542. This indicated that as the number of peer choices decreased, holding SRRQ constant, SIRS scores tended to increase.

There was no significant increase in R^2 when a vector representing the number of siblings living in the home (SIBLINGS) was added to life event stress scores (SRRQ) as predictors of children's seriousness of illness scores (SIRS). The multiple R was .252 which accounted for 6.3 percent of the variance in SIRS scores, an increase in R^2 of

.003. This increase was not significant at the .05 level of confidence.

The partial regression coefficients for this model were: SRRQ was .247; SIBLINGS was -0.058 with a constant of 17.936. In this model, SRRQ scores alone were as efficient in predicting SIRS scores as were the two variables, SRRQ and SIBLINGS, together.

There was no significant increase in R^2 when a vector representing the number of parents living in the home (PARENTS) was added to life event stress scores (SRRQ) as predictors of children's seriousness of illness scores (SIRS). The multiple R was .251 which accounted for 6.3 percent of the variance in SIRS scores, an increase in R^2 of .003. This increase was not significant at the .05 level of confidence. The partial regression coefficients for this model were: SRRQ was .240; PARENTS was -0.052 with a constant of 22.340. Therefore, null hypothesis 8a was rejected, while hypotheses 8b and 8c were retained.

There was no significant increase in R^2 when a vector discriminating sex (females = 0, males = 1) was added to life events stress scores (SRRQ) as predictors of children's seriousness of illness scores (SIRS). The multiple R was .257 which accounted for 6.6 percent of the variance in SIRS scores, an increase in R^2 of .006. This increase was not significant at the .05 level of confidence. Therefore, null hypothesis 9 was retained.

The partial regression coefficients for this model were: $\underline{SRRQ}$ was .233; SEX was -0.076 with a constant of 18.59. This suggests that male and female children tend to score similarly on the $\underline{SIRS}$.

The interactions between the three social support variables (PEER CHOICE, PARENTS, SIBLINGS) and scores on the $\underline{\text{Piers-Harris Children's Self Concept Scale}}$ ($\underline{CSCS}$) are summarized in Tables III, IV, and V.

Table III shows the variance and associated $\underline{F}$ scores found when $\underline{SRRQ}$ (Y_2), PEER CHOICE (X_1) and $\underline{CSCS}$ (X_6) form the basic model and when the interaction (X_7) of PEER CHOICE and $\underline{CSCS}$ is added to form a second model. As can be seen in Table III, the interaction variable, PEER CHOICE/$\underline{CSCS}$, has an associated $\underline{t}$ of -.01 which is not significant at the .05 level of confidence. In other words, the model containing $\underline{SRRQ}$, PEER CHOICE and $\underline{CSCS}$ is as efficient in predicting children's $\underline{SIRS}$ scores as the model containing $\underline{SRRQ}$, PEER CHOICE, $\underline{CSCS}$ and the interaction variable, PEER CHOICE/$\underline{CSCS}$. Therefore, null hypothesis 10a was retained.

Table IV shows the variance and associated $\underline{F}$ scores found when $\underline{SRRQ}$ (Y_2), SIBLINGS (X_2) and $\underline{CSCS}$ (X_6) form the basic model and when the interaction of SIBLINGS and $\underline{CSCS}$ (X_8) is added to form a second model. Both models presented in Table IV have associated $\underline{F}$ values which fail to reach statistical significance. The interaction variable, SIBLINGS/$\underline{CSCS}$, has an associated $\underline{t}$ of -1.21 which is not

Table III

Significance of Interaction of Self Concept and
Peer Choice Status Added to Life Stress as
Predictors of Seriousness of Illness

Model	R^2	Change R^2	Predictor Variables	t	Probability of t	F	Significant F
$R^2(Y_1 \cdot Y_2, X_1, X_6)$	.122	---	SRRQ	2.59	.011*	4.446	.006*
			PEER CHOICE	-2.54	.012*		
			CSCS	.96	.430		
$R^2(Y_1 \cdot Y_2, X_1, X_6, X_7)$		0.0	SRRQ	2.56	.012*	3.30	.014*
			PEER CHOICE	-1.16	.250		
			CSCS	.56	.58		
			PEER CHOICE/CSCS	-0.01	.99		

*p < .05
**p < .01
***p < .001

Table IV

Significance of Interaction of Self Concept and
Siblings Added to Life Stress as Predictors
of Seriousness of Illness

Model	R^2	Change R^2	Predictor Variables	$\underline{t}$	Probability of $\underline{t}$	$\underline{F}$	Significant $\underline{F}$
$R^2(Y_1, Y_2, X_2, X_6)$	.006	---	SRRQ SIBLINGS CSCS	2.54 .55 .46	.01* .58 .65	2.252	0.087
$R^2(Y_1, Y_2, X_2, X_6, X_8)$	.079	.013	SRRQ SIBLINGS CSCS SIBLINGS/CSCS	2.64 .73 1.24 -1.21	.01* .47 .22 .23	2.062	0.092

*p < .05
**p < .01
***p < .001

Table V

Significance of Interaction of Self Concept and Number
of Parents Added to Life Stress as Predictors
of Seriousness of Illness

Model	R^2	Change R^2	Predictor Variables	t	Probability of t	F	Significant F
$R^2(Y_1 \cdot Y_2, X_3, X_6)$	.065	---	SRRQ PARENTS CSCS	2.46 −.50 .47	.02* .62 .64	2.23	.09
$R^2(Y_1 \cdot Y_2, X_3, X_6, X_9)$	.065	0.0	SRRQ PARENTS CSCS PARENTS/CSCS	2.41 −.29 −.02 .09	.02* .77 .99	1.66	.17

*p < .05
**p < .01
***p < .001

significant at the .05 level of confidence. Therefore, null hypothesis 10b was retained.

Table V shows the variance and associated F scores found when SRRQ (Y_2), PARENTS (X_3) and CSCS (X_6) form the basic model and when the interaction (X_9) of PARENTS and CSCS is added to form a second model. Both models presented in Table V have associated F values which fail to reach statistical significance. The interaction variable, PARENTS/CSCS, has an associated t of .09 which is not significant at the .05 level of confidence. Therefore, null hypothesis 10c was retained.

Table VI

The Most Efficient Predictors of Seriousness
of Illness Scores Using
Stepwise Regression

Step	Variable	Multiple R	R^2	Increase R^2	d/f	F
1	SRRQ	.246	.06	---	1/98	6.301*
2	PEER CHOICE	.337	.11	.05	1/97	5.818*

* F = 3.98   p   .05 with 1/100 df

The most efficient predictors of seriousness of illness are shown, in rank order, in Table VI. All predictors were entered and the most efficient predictor was selected. From this point, each vector was selected on the basis that it would result in a significant increase in R^2. The most efficient predictors, those that reached statistical

significance, were SRRQ and PEER CHOICE. The partial
regression coefficients for this model were   SRRQ was .246,
PEER CHOICE was .231 with a constant of 24.542. There was
no interaction term reaching significance in this model.
Therefore, null hypothesis 11 was retained.

Chapter V

SUMMARY, FINDINGS, DISCUSSION, IMPLICATIONS
AND RECOMMENDATIONS

Summary

This research study was initiated to examine the
relationships among social support, self concept, anxiety,
stress and seriousness of illness in children and to
investigate the potential of cognitive mediating variables,
such as anxiety and self concept, and of external mediating
variables, such as social support, to significantly increase
the efficiency of stress as a predictor of seriousness of
disease in children.

A total of 138 subjects, a sample of convenience,
were selected from five fourth grade elementary classrooms
from the public school system of a small midwestern city.
Twenty-seven of the subjects were dropped from the study due
to parents' failure to complete and return permission forms
or due to absenteeism on the day of testing. All subjects
were 9 or 10 years old. Fifty-five percent were male and
forty-five percent were female. The researcher administered
the classroom testing, while parents completed the Serious-
ness of Illness Rating Scale and the Social Readjustment
Rating Questionnaire. The following instruments were
administered by the researcher in each classroom:

a. The Piers-Harris Children's Self Concept Scale

b. The State-trait Anxiety Inventory for Children

c. A sociometric measure based on two directives:
    (1) List the names of the children present in
    this classroom today with whom you would choose
    to work in a study group and (2) List the names
    of the children present in this classroom today
    with whom you would choose to play.

In addition, information was obtained by the researcher from
the children about the number of siblings and parents cur-
rently living in the home.

Hypotheses 1-5 were treated statistically using
correlation and a t test for significance of correlation.
Hypotheses 6-11 were treated statistically by using multiple
linear regression.

Findings

Hypothesis 1 stated that there will be a significant
positive correlation between the variables of stress and the
seriousness of illness in children as determined by scores on
the Social Readjustment Rating Questionnaire and the Serious-
ness of Illness Rating Scale. The results from the correla-
tion supported this hypothesis and hypothesis 1 was retained.

Hypothesis 2 stated that there will be a significant
positive correlation between stress and trait anxiety in
children as determined by scores on the Social Readjustment

Rating Questionnaire and the State-trait Anxiety Inventory for Children. The results from the correlation did not support this hypothesis and hypothesis 2 was rejected.

Hypothesis 3 stated that there will be a significant negative correlation between stress and self concept in children as determined by scores on the Social Readjustment Rating Questionnaire and the Piers-Harris Children's Self Concept Scale. The results from the correlation supported this hypothesis and hypothesis 3 was retained.

Hypothesis 4 stated that there will be a significant negative correlation between stressful life events and social support in children as determined by the Social Readjustment Rating Questionnaire and

    a. the number of choices received on a sociometric measure,

    b. the number of siblings living in the home, and

    c. the number of parents living in the home.

The results of the correlation did not support hypotheses 4a, 4b and 4c. Therefore, hypotheses 4a, 4b and 4c were rejected.

Hypothesis 5 stated that there will be a significant negative correlation between trait anxiety and self concept in children as determined by scores on the State-trait Anxiety Inventory for Children and the Piers-Harris Children's Self Concept Scale. Results from the correlations supported this hypothesis and hypothesis 5 was retained.

Hypothesis 6 stated that using stress as a predictor of illness, a significant increase in R^2 will be obtained when trait anxiety is added to the model as determined by scores on the Seriousness of Illness Rating Scale, the Social Readjustment Rating Questionnaire and the State-trait Inventory for Children. The results from the multiple linear regression did not support this hypothesis and hypothesis 6 was rejected.

Hypothesis 7 stated that using stress, as determined by scores on the Social Readjustment Rating Questionnaire, as a predictor of seriousness of illness in children, as determined by scores on the Seriousness of Illness Rating Scale, a significant increase in R^2 will be obtained when self concept, as determined by scores on the Piers-Harris Children's Self Concept Scale, is added to the model. The results from the multiple linear regression did not support this hypothesis and hypothesis 7 was rejected.

Hypothesis 8 stated that using stress as a predictor of seriousness of illness in children, a significant increase in R^2 will be obtained when social support is added to the model. Social support was determined by

  a. choices received on a sociometric measure,

  b. the number of siblings living in the home, and

  c. the number of parents living in the home.

The results from the multiple linear regression supported hypothesis 8a. Section a of hypothesis 8 was retained. The

results from the multiple linear regression did not support sections b and c of hypothesis 8. Therefore, hypotheses 8b and 8c were rejected.

Hypothesis 9 stated that using stress as a predictor of seriousness of illness in children, no significant increase in R^2 will be obtained when a vector discriminating sex is added to the model. The results from the multiple linear regression supported this hypothesis and hypothesis 9 was retained.

Hypothesis 10 stated that using stress as a predictor of seriousness of illness in children, a significant increase in R^2 will be obtained when a multiplicative combination of self concept and social support is added to the model. That is, there will be a significant interaction between self concept and social support. Self concept was determined by scores on the Piers-Harris Children's Self Concept Scale. Social support was determined by

    a. the number of choices received on a sociometric measure,

    b. the number of siblings living in the home, and

    c. the number of parents living in the home.

The results of the multiple linear regression did not support hypotheses 10a, 10b and 10c. Therefore, hypotheses 10a, 10b and 10c were rejected.

Hypothesis 11 stated that the most efficient model in predicting seriousness of illness in children will

include some combination of anxiety, self concept and social support. The results from the multiple linear regression did not support this hypothesis and hypothesis 11 was rejected.

Discussion

Hypothesis 1 examined the correlation between stressful life events and the frequency and seriousness of illness in children. A significant positive correlation was found. The literature provides abundant support for such a correlation for adults (Holmes & Rahe, 1967; Wyler, Masuda & Holmes, 1970; Garrity, Marx & Somes, 1978). Fewer studies are available which examine the relationship between stress and illness in children. The results of this study support the research of Heisel (1972), Sheridan and Kline (1978) and Jacobs and Charles (1980) that stressful life events are associated with illness in children. However, this study differs from other studies which have examined the relation-ship between stress and illness in children. Other studies reported in the literature which have explored the stress-illness relationship in children have used correlation statistics, while this study used the multiple linear regression statistic. These results support using as the basic model, stress as a predictor of children's illness in hypotheses 6-11. The direction of the correlations found

in this study suggest that the subject children with high
scores on one measure tended to score high on the other
measure.

The relationship between stress and trait anxiety
was examined in hypothesis 2. No significant correlation
was found between stress and trait anxiety. This result is
difficult to interpret when considered in the context of the
literature which supports a significant positive correlation
between stress and anxiety in adults (Manuck, 1975; Reavley,
1974; Hinrichsen & Ross, 1976). The results of this study
suggest no relationship exists between stress and trait
anxiety in children. Subjects scoring high on one measure
may or may not score high on the other measure. This find-
ing may be related to the use of trait anxiety scores rather
than the use of state anxiety scores, both provided by the
State-trait Anxiety Inventory for Children. Trait anxiety
is defined as relatively stable individual differences in
anxiety proneness (Montgomery, 1974). Trait anxiety pre-
disposes the individual to react to situations with worry
and anticipation (Spielberger, 1972). State anxiety is
defined as transitory anxiety states that vary over time
(Montgomery, 1974). The characteristic response to external
stimuli, defined as trait anxiety, may not be as well
established in children as it is in adults. It may be that
a significant positive correlation between state anxiety
and stress would be found in children. It would seem likely

that, given children's tendency to respond to the immediate situation, that a significant relationship might exist between state anxiety and stressful life events. Another possible interpretation is that the trait anxiety scale of the State-trait Anxiety Inventory for Children is measuring a separate dimension than the Social Readjustment Rating Questionnaire. For children, stress, as measured by the Social Readjustment Rating Questionnaire, may be a phenomenon separate from trait anxiety as measured by the State-trait Anxiety Inventory for Children. It may be that stress, defined as an external condition or situation, is a separate phenomenon from anxiety, defined as a phenomenon existing within the child.

Hypothesis 3 examined the relationship between self concept as determined by scores on the Piers-Harris Children's Self Concept Scale and stress as determined by scores on the Social Readjustment Rating Questionnaire. A significant correlation was found between self concept and stress. The relationship was such that the higher the self concept score the lower the life event stress score. Research findings generally indicate that individuals with high self concepts believe themselves to be more effective in meeting societal demands than individuals with low self concepts (Briggs, 1975). Children who experience many of the events listed on the Social Readjustment Rating Questionnaire are not likely to be in a position to directly

cope with the situation. They are often dependent on the adults in their environments to cope with the demands of the life event. Children who have experienced a greater number of stressful life events may have encountered more situations in which they felt ineffective, especially if the adults on whom they depend have not successfully coped with the stress of certain life events. Therefore, the children may believe themselves to be less effective in meeting situational demands. The lower self concept scores may be reflecting this feeling of ineffectiveness.

Hypothesis 4 examined the relationship between stress, as determined by scores on the Social Readjustment Rating Questionnaire, and social support as determined by

    a. the number of choices received on a sociometric measure,

    b. the number of siblings living in the home, and

    c. the number of parents living in the home.

Contrary to the stated direction of hypothesis 4, the number of siblings and parents living in the home and the number of choices received showed no significant relationship to stress. The research that has explored the relationship between stress and various measures of social support has tended to focus on social support as a mediating variable between stress and physical or psychological dysfunction. The results of this research may prove helpful in interpreting some of this research. Coddington (1972) conducted

a study in which he examined the influence of specific demographic variables on scores on his recently developed Social Readjustment Rating Questionnaire. Coddington found no differences in the reported number of listed life events occurred between sexes, races or members of different socio-economic levels. In other words, the life events listed tended to occur randomly over these specific demographic variables. Although a few of the events listed relate directly to the presence of siblings and parents in the home (i.e., death of a parent, divorce of parents) the results of Coddington's study suggest the life events included on Coddington's scale tend to occur randomly over family size. Thus, the results of this study appear to support Coddington's study.

The results of the correlational analysis between stress and social support further suggest that sociometric choices have no significant relationship with stress. This result seems to simply suggest that stressful life events occur in the lives of children who receive many choices from their classmates as well as in the lives of children who receive few choices from their classmates. In other words, stressful life events tended to occur in a random manner manner with regard to sociometric choice status. However, another point of exploration in this study was on socio-metric choice status as a mediating variable in the stress-illness process in children. The question was, "Will

children who have experienced high numbers of stressful life events and high choice status score differently on the Seriousness of Illness Rating Scale than children who have experienced high numbers of stressful life events, but low choice status?" This will be discussed in connection with hypothesis 8.

Hypothesis 5 stated that there will be a significant negative correlation between self concept and trait anxiety as determined by scores on the Piers-Harris Children's Self Concept Scale and the State-trait Anxiety Inventory for Children. The results from the correlational analysis supported this hypothesis and hypothesis 5 was accepted. This result is in line with the vast amount of research which has examined the relationship between self concept and anxiety in children.

The basis for testing hypotheses 6-11 was using life events, the Social Readjustment Rating Questionnaire (SRRQ), as a predictor of seriousness of illness in children, the Seriousness of Illness Rating Scale (SIRS). The utilization of this basic model was supported by the significant correlation between SRRQ and SIRS scores. Hypothesis 6 was tested by adding trait anxiety to this basic model. The addition of trait anxiety in order to increase the effectiveness of stress as a predictor of children's illness was supported by the lack of correlation found between stress and anxiety in this study. In other words, the SRRQ and the SIRS appear to be unrelated phenomena.

Stressful life events alone were a significant predictor of SIRS scores, accounting for 6 percent of the variance in the SIRS scores. There was no significant increase in R^2 when trait anxiety scores were added to the basic model. Trait anxiety was defined in this study as a cognitive mediating variable that may moderate the effects of life event stress. Children who score low on trait anxiety would tend to react to stressful life situations in such a manner as to not trigger the physiological mechanisms that lead to illness. Conversely, children who score high on trait anxiety would tend to interpret a stressful life event as more threatening and would thus encounter greater physical illness. In other words, of a group of children who have experienced a high number of stressful life events, those children in that group who also score high on trait anxiety measures, would tend to suffer more physical or psychological dysfunction than a subgroup of children who score low on trait anxiety measures. The results of the data analysis did not support the role of anxiety as a cognitive mediating variable in the stress-illness process in children. This finding contrasts sharply with the results of Harris' (1980) study. Harris found that trait anxiety accounted for 21 percent of the variance in seriousness of illness scores of adults, while life event stress

scores only accounted for 6 percent of the variance in the seriousness of illness scores. However, for children, it is apparently stressful life events and not their interpretation that is more efficient in predicting children's seriousness of illness.

In hypothesis 7 self concept was added to the basic model of stress as a predictor of children's seriousness of illness. Again, no significant increase in predictive efficiency was found. Holding the life event score constant, children who scored high on the self concept measure did not differ significantly from children who scored low on the self concept measure with regard to their scores on the Seriousness of Illness Rating Scale. In developing hypothesis 7, self concept was expected to function as a cognitive mediating variable. Since part of an individual's self concept is belief about how well one can cope with societal demands (Briggs, 1975), it was expected that, holding the life event score constant, those children with high self concepts would score lower on the Seriousness of Illness Rating Scale than those children with low self concept scores. This was not supported by the results of this study. Self concept did not prove to exert a significant moderating effect between stress and children's illness. The results of this study with regard to both anxiety and self concept suggest that cognitive mediating variables do not significantly impact the possible physical consequences of stressful

life events on children. Thus, the implications for psycho-
therapy for children would include a focus on developing
skills to deal with life events, rather than on enhancing
the child's self concept or reducing the child's anxiety.

In hypothesis 8 it was suggested that when social sup-
port was added to the basic model, stress as a predictor of
children's illness, a significant increase in R^2 would occur.
Contrary to the hypothesized direction, two of the social
support measures, number of siblings and parents living in
the home, did not significantly add to life change scores as
a predictor of seriousness of illness in children. However,
the number of choices received on the sociometric measure
did significantly increase the ability to predict serious-
ness of illness. The nature of this relationship is such
that given a constant stress score, the higher the socio-
metric choice status, the lower the score on the Seriousness
of Illness Rating Scale. A child who is highly chosen by
his or her peers appears to be less vulnerable to the stress
of life change experiences than a child who receives few
choices. The sociometric measure reveals little about the
nature of the relationship between the children. It is not
known whether the children share their experiences with each
other or support each other when under stress, or whether
the choice status simply reflects popularity. Whether or
not the increase in predictive efficiency is related to the
child's own perception of his or her own peer choice status

is not clear, although it may be that children are subjectively aware of their status. The highly chosen child is one who is sought out in both play and work situations. These children may be sought out because they have shown skills in coping with social demands.

The significance of peer choice status stands in contrast to the failure of family support to produce significant increases in predictive efficiency when added to the basic model. The number of parents and the number of siblings living in the home had no significant correlation with any of the other variables in this study except with each other. It would seem that the family support variables would be the most likely of the social support variables to play the buffer role between stress and illness in children. A child 9 or 10 years of age is still very dependent on the family. The variables used in this study to assess the family are gross measures that may lack the necessary sensitivity to adequately determine the role parents and siblings play in the stress-illness process of children. Further investigation is needed to explore in greater detail the relationship between children, between children and their families and between these variables and the stress-illness process in children.

Hypothesis 9 was tested by adding a vector discriminating sex to the basic model of stress as a predictor of children's seriousness of illness. The results of this

study fail to support sex as an important variable in predicting seriousness of illness in children. Other research has found sex to be a significant predictor of illness in adults (Harris, 1980). It is interesting to speculate as to why sex is a significant predictor of illness for adults, but not for children. It may be that the illness reaction to stress is a learned behavior. Women in our culture may experience a greater number of illnesses following life changes than men as a learned response. This learning may not yet have occurred with children as young as nine or ten years of age. Therefore, it does not contribute significantly to the predictive efficiency of stress.

In order to test hypothesis 10, the interaction between self concept and the social support measures were added to the basic model of stress as a predictor of children's illness. The interactions of self concept with peer choice status, number of parents and number of siblings living in the home were added to the basic model of stress as a predictor of children's illness. The interactions of self concept with peer choice status, number of parents and number of siblings living in the home did not yield a significant increase in R^2.

The final hypothesis was designed to determine the most efficient model in predicting children's illness. The first predictor in this model was to be the one that made the greatest significant contribution to R^2. The remaining

variables were added, one at a time, in a stepwise manner. Each variable was selected on the basis that it made the greatest contribution to the predictive efficiency of the model in comparison to all the other remaining variables. Two variables were selected which made significant contribution to predictive efficiency. These were, in order of importance, stressful life events and the number of peer choices received. The remaining variables contributed less than significant increases in predictive efficiency. Therefore, these two variables were selected as comprising the most efficient model in predicting children's seriousness of illness.

The stressful life events variable was found in this study to be the most efficient variable in predicting children's seriousness of illness. Stressful life events was found to be a more efficient predictor than the cognitive mediating variables of self concept and trait anxiety. This finding underscores the importance of environment in the lives of children. The results of this study do not support the theoretical position that cognitive variables which play a role in the evaluation of life events, are important in predicting children's seriousness of illness.

The other variable entered into the most efficient model in predicting children's seriousness of illness was the number of peer choices received on a sociometric test. The results indicate that children in this sample who

received few choices had higher scores on the seriousness of illness measure than did children who received a high number of choices. Although there has been little research done using the Social Readjustment Rating Questionnaire to predict children's illness, it would appear important to consider social support from peers as a variable in future research exploring illness in children.

Implications

The results of this study have implications for several aspects of the stress-illness model in children. Theoretically, support was found for external mediating factors in the stress-illness model for children. However, support was not found for cognitive mediating variables, such as self concept and trait anxiety. Finally, support for the use of the Social Readjustment Rating Questionnaire in predicting childhood illness was yielded by this study.

The external mediating factors theory of stress (Dohrenwend & Dohrenwend, 1972; Dohrenwend & Dohrenwend, 1974; Wolf & Goodell, 1968) proposes that between the occurrence of a life event and the physical reactions that may result in disease, external factors may mediate. This study found a significant correlation between childhood seriousness of illness and peer choice status which could potentially moderate the effects of stressful life events and a child's disease reaction.

In order to examine the value of specific variables as predictors of childhood illness, selected variables were added, using multiple linear regression, to stress as a predictor of childhood disease in an attempt to increase the predictive efficiency of stress. Only one variable, peer choice status, made a significant contribution to stress as a predictor of childhood disease. This finding indicates that peer choice status mediated between stressful life events and childhood disease processes. Not only must future research consider if children experience stressful life events, but it must also consider if these children also experience low social support in the form of low peer choice status.

The results of this study have implications concerning the use of Coddington's Social Readjustment Rating Questionnaire. This instrument explained only about 6 percent of the variance in predicting scores on the Seriousness of Illness Rating Scale. While the Social Readjustment Rating Questionnaire is concerned with external events, this study suggests that other external variables must be included. Knowing the stress level alone, in the form of stressful life events, does not allow a high degree of predictive efficiency for children's illness. By adding social support, in the form of peer choice status, this predictive efficiency is significantly increased. If social support can be increased for those children who have experienced a high

number of stressful life events, it appears their risk of illness may be reduced.

An important contribution of this study was to examine the possibility that social support functions as a mediating variable in the stress-illness process of children. Social support has not been a major factor in many of the stress management programs available for adults, although research supports its function as a mediating variable in the stress-disease process for adults (Holmes, 1956; Levy & Rowitz, 1973; Linsky, 1970). Stress management programs for children are rare and there is no other research which examines the role of peer choice status in the stress-illness process of children. After identifying children who are under significant stress, the results of this study indicate that programs designed to enhance peer choice status may be implemented which may reduce the risk of high stress children for future illness. Schools and community agencies are just two settings where such programs could take place.

Peer choice status within the classroom is only one source of social support for children. This study included the presence of parents and siblings in the home as variables of social support. Neither variable significantly increased the predictive efficiency of stress. This is difficult to explain. It may be that the range of the number of parents and siblings living in the home was too restricted in this study, accounting for the lack of significance. In a larger

sample these two variables may be found to make a significant contribution to the predictive efficiency of stress. In addition other sources of social support, such as ethnic congruence in the neighborhood (Dohrenwend & Dohrenwend, 1974), the presence of other significant adults, friendships other than those found in the classroom and participation in organized groups, should be explored as variables of social support in future research.

Peer choice status, ethnic congruence with the neighborhood and formal group membership as measures of social support seem to reflect only the potential of social support. Perception of social support may also be a critical factor to explore. A child may receive a high number of choices on a sociometric measure and yet not be aware of that potential social support. It may be possible to explore perception of social support by recording each child's prediction of how many choices he or she will receive on a sociometric measure. This measure of perceived social support may increase the predictive efficiency of stress. In addition, the interaction of predicted choices and choices actually received may also significantly increase the explained variance in children's illness scores. The purpose of this study was to begin the exploration of social support as a mediating variable in the stress-illness process of children and the findings suggest that future research in this area is warranted.

As a result of the findings of this study, the following recommendations are made:

1. A similar research study should be conducted using different measures of social support, e.g. prediction of choices received on a sociometric measure, ethnic congruence with the neighborhood and formal group membership.

2. A similar research study should be conducted using behavioral dysfunctions as the dependent variable.

3. A similar research study should be conducted using more predictor variables, e.g. parental subjective perception of stress, measures of parental trait anxiety, and measures of parental social support, in the prediction of illness in children.

4. A similar research study should be conducted using younger children as subjects to examine the possibility that family social support variables have more impact as external mediating variables in the stress-illness process in young children.

5. Counseling programs in schools and community agencies should be aware of the impact of social support in the form of peer choice status on the physical health of children.

CHAPTER BIBLIOGRAPHY

Briggs, D. C. Your child's self-esteem. Garden City, New York: Doubleday and Company, 1975.

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children. Journal of Psychosomatic Research, 1972, 16, 1-18.

Dohrenwend, B. S., & Dohrenwend, B. P. Class and race as status related sources of stress. In S. Levine and N. A. Scotch (Eds.), Social stress. Chicago: Aldine Publishing Company, 1970, pp. 111-140.

Dohrenwend, B. S., & Dohrenwend, B. P. Stressful life events: Their nature and effects. New York: John Wiley and Sons, 1974.

Garrity, T. F., Marx, M. B., & Somes, G. W. The relationship of recent life change to seriousness of later illness. Journal of Psychosomatic Research, 1978, 22, 7-11.

Harris, J. L. Imagery, self-concept, anxiety and stress as predictors of seriousness of disease. Unpublished doctoral dissertation, North Texas State University, 1980.

Heisel, J. S. The significance of life events as contributing factors in the diseases of children. Journal of Pediatrics, 1973, 83, 119-123.

Holmes, T. H., & Hawkins, N. G. Psychosocial and psychophysiological studies of tuberculosis. Alaska: Ladd Air Force Base, Arctic Aero-Medical Lab., Project 8-7951, February, 1956.

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

Jacobs, T. J., & Charles, E. Life events and cancer in children. Psychosomatic Medicine, 1980, 42, 11-24.

Levy, L., & Rowtiz, L. The ecology of mental disorder. New York: Behavioral Publications, 1973.

Linsky, A. Social Psychiatry, 1970, 5, 166-173.

Manuck, S. B., Hinrichsen, J. J., & Ross, E. O. Life stress, locus of control, and state and trait anxiety. Psychological Reports, 1975, 36, 413-414.

Montgomery, L. E., & Finch, A. J., Jr. Validity of two measures of anxiety in children. Journal of Abnormal Child Psychology, 1974, 2, 293-298.

Reavely, W. The relationship of life events to several aspects of anxiety. Journal of Psychosomatic Research, 1974, 18, 421-424.

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

Sheridan, M. S., & Kline, R. Psychosomatic illness in children. Social Casework, 1978, 59, 227-232.

Spielberger, C. D. Anxiety: Current trends in theory and research. New York: Academic Press, 1972.

Wolf, S., & Goodell, H. (Eds.). Harold G. Wolff's stress and disease. Springfield, Illinois: Thomas, 1968.

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

APPENDIX A

SOCIAL READJUSTMENT RATING QUESTIONNAIRE

APPENDIX A

SOCIAL READJUSTMENT RATING QUESTIONNAIRE

Under the "Number of Occurrences" indicate how many times in the past year your child has experienced the event listed.

Life Event	Number of Occurrences
Beginning another school year	_____
Outstanding personal achievement	_____
Beginning school	_____
Move to a new school district	_____
Increase in number of arguments with parents	_____
Change in parents' financial status	_____
Death of a grandparent	_____
Decrease in number of arguments between parents	_____
Mother beginning to work	_____
Becoming a full-fledged member of a church	_____
Brother or sister leaving home	_____
Seriousness illness requiring hospitalization of a parent	_____
Decrease in number of arguments with parents	_____
Change in father's occupation requiring increased absence from home	_____
Change in child's acceptance by peers	_____
Increase in number of arguments between parents	_____
Death of a close friend	_____
Birth of a brother or sister	_____
Pregnancy of unwed teenage sister	_____
Seriousness illness requiring hospitalization of brother or sister	_____
Loss of job by a parent	_____
Failure of a grade in school	_____
Divorce of parents	_____

Life Event	Number of Occurrences
Suspension from school	_____
Addition of third adult to family	_____
Marital separation of parents	_____
Serious illness requiring hospitalization of child	_____
Marriage of parent to step-parent	_____
Having a visible congenital deformity	_____
Acquiring a visible deformity	_____
Death of a brother or sister	_____
Discovery of being an adopted child	_____
Becoming involved with drugs or alcohol	_____
Jail sentence of parent for 30 days or less	_____
Jail sentence of parent for one year or more	_____

APPENDIX B

SERIOUSNESS OF ILLNESS
RATING SCALE

APPENDIX B

SERIOUSNESS OF ILLNESS RATING SCALE

Name _____

Please read the following list of illnesses. Place a number in the blank before any illness or problem your child had experienced to indicate <u>how</u> <u>many</u> times that illness has occurred for your child <u>in</u> the past <u>twelve</u> <u>months</u> only. Place a number before <u>only</u> those problems your child has experienced. Accuracy is very important; place a number before <u>only</u> the appropriate illness.

___Warts	___Hemmorhoids
___Cold sore, canker sore	___Hay fever
___Hiccups	___Low blood pressure
___Bad breath	___Eczema
___Sty	___Drug allergy
___Common cold	___Bronchitis
___Farsightedness	___Hyperventilation
___Nosebleed	___Shingles
___Sore throat	___Mononucleosis
___Nearsightedness	___Infected eye
___Sunburn	___Bursitis
___Constipation	___Whooping cough
___Astigmatism	___Fibroids of the uterus
___Laryngitis	___Migraine
___Ringworms	___Hernia
___Headache	___Frostbite
___Scabies	___Goiter
___Boils	___Ovarian cyst
___Heartburn	___Heatstroke
___Acne	___Irregular heart beats
___Abcessed tooth	___Overweight
___Colorblindness	___Anemia
___Tonsillitis	___Anxiety reaction
___Diarrhea	___Gout
___Carbuncle	___Snake bite
___Chicken pox	___Appendicitis
___Mumps	___Pneumonia
___Dizziness	___Depression
___Sinus infection	___Burns
___Increased menstrual flow	___Kidney infection
___Fainting	___Hyperthyroid
___Measles	___Asthma
___Painful menstruation	___Glaucoma
___Infection of the middle ear	___Gallstones
___Psoriasis	___Arthritis

_____Starvation
_____Accidental poisoning
_____Slipped disk
_____Hepatitis
_____Kidney stones
_____Peptic ulcer
_____Pancreatitis
_____High blood pressure
_____Smallpox
_____Deafness
_____Collapsed lung
_____Shark bite
_____Epilepsy
_____Chest pain
_____Nervous breakdown
_____Diabetes
_____Blood clot in blood vessels
_____Tuberculosis
_____Alcoholism
_____Drug addiction
_____Coma
_____Cirrhosis of the liver
_____Parkinson's disease

_____Blindness
_____Mental retardation
_____Blood clot in the lungs
_____Manic depressive
     psychosis
_____Stroke
_____Schizophrenia
_____Muscular dystrophy
_____Congenital heart
     defects
_____Tumor in the spinal cord
_____Cerebral palsy
_____Heart failure
_____Heart attack
_____Brain infection
_____Multiple sclerosis
_____Bleeding in the brain
_____Uremia
_____Cancer
_____Leukemia

APPENDIX C

REQUEST FOR MODIFICATION TO
SERIOUSNESS OF ILLNESS RATING SCALE

APPENDIX C

REQUEST FOR MODIFICATION TO
SERIOUSNESS OF ILLNESS RATING SCALE

April 19, 1982

Dr. Victor R. Alvarez
1716 Scripture
Denton, Texas

Dear Sir:

We are conducting a study which examines the relationship
between stressful life events and the incidence of illness
in children. The Seriousness of Illness Rating Scale is an
instrument which measures illness in adults. However, no
such scale exists for children. We are requesting 10
minutes of your time in modifying this scale for use with
children.

Enclosed is a copy of the Seriousness of Illness Rating
Scale. Please indicate by drawing a line through the
appropriate item any illness that is not applicable in
diagnosing illness in male and female children of elementary
school age (5-11 years). Draw on your experience in work-
ing with children to select out those items which are
inappropriate in diagnosing childhood illness.

Please return the corrected Seriousness of Illness Rating
Scale in the self-addressed, stamped envelope. If you have
any questions, please contact me at: 788-2066 or 566-3999.

Thank you for your prompt help in adapting this scale.

Sincerely,

/s/Garry L. Landreth
Garry L. Landreth
Professor, Counselor Education

/s/Janelle Cowles
Janelle Cowles
Counseling Intern

APPENDIX D

LETTER TO TEACHERS

APPENDIX D

LETTER TO TEACHERS

Dear _____,

Thank you for agreeing to participate in my study. Your cooperation is greatly appreciated.

I have enclosed 30 envelopes containing the following: 1) the Seriousness of Illness Rating Scale, 2) the Social Readjustment Rating Questionnaire and 3) an explanatory letter and permission form to parents.

On Monday, May 3, please distribute one envelope (containing the explanatory letter, the Seriousness of Illness Rating Scale and the Social Readjustment Rating Questionnaire) to each student in your classroom. The children are to take the scales and letter home to their parents. Parents are asked in the explanatory letter to complete both scales, sign the letter granting permission for their child to participate in the study, and return all three forms to you on the following day (Tuesday, May 4).

On Wednesday, May 5, please send home one of the enclosed follow-up notes to any parent who has not yet returned the three forms.

I will contact you on May 9 to find out how many children have returned the three forms. At that time we will schedule a time for me to visit your classroom during the week of May 10-14. During the time we schedule, I will administer to each child who has returned the three forms the Piers-Harris Self Concept Scale, the State-trait Anxiety Inventory for Children and a sociometric test. These tests will be group administered and will require about 40 minutes to complete.

As the children return their forms it will be important to note that each form has the child's name on it. It is also important that all three forms are returned, including the letter granting permission to participate in the study. If parents do not return the written consent form, their child will not be included in the study.

Again, I thank you for your cooperation in helping me complete this study. If you have any questions, please contact Dr. Shirley Hendricks at 882-1436.

Sincerely,

/s/Janelle Cowles

APPENDIX E

LETTER AND PERMISSION FORM
TO PARENTS

APPENDIX E

LETTER AND PERMISSION FORM
TO PARENTS

May 3, 1982

Dear Parents,

I have been given permission by the Springfield R-12 school
district to conduct a study designed to increase our under-
standing of children's illnesses. Your child's classroom
has been selected to participate in this study.

I am requesting about 20 minutes of your time to help me
complete this most important study. Enclosed is a copy of
a scale which measures the number of major experiences in
your child's life over the previous year and a scale which
measures the number of illnesses your child has experienced
in the last year. I would like for you to complete both
scales according to the directions at the top of each scale.
As you will notice on each scale you will only need to place
a number or a check mark in the blanks. Complete each form
for your fourth grade child only.

With your permission, one day next week I will visit your
child's fourth grade classroom and administer scales measur-
ing self-concept, friendship and events that may cause
children to feel anxious. The scales will be administered
to the children as a group and will require about 40 minutes.
In order for your child to be included, I need your written
permission. Please sign and return this letter with the
completed life events scale and illness scale to your
child's teacher tomorrow.

No child's name will be used in any way in the study, since
we are interested only in information about children in
general.

It is my belief that as we gain greater knowledge about
children, we are better able to help them learn. Thank you
for your contribution to this study by completing and
returning:

              1. the life events scale,
              2. the illness scale, and
              3. the signed permission form.

Please sign the form below and ask your fourth grade child to return it to his or her teacher tomorrow along with the life events scale and the illness scale. If you have any questions, please contact Dr. Shirley Hendricks at 882-1436.

Sincerely,

/s/Janelle Cowles
Janelle Cowles

_____ has permission to participate
(your 4th grade child's name)

in this study.

_____
Parent's signature

APPENDIX F

MEANS AND STANDARD DEVIATIONS
FOR VARIABLES EXAMINED

APPENDIX F

MEANS AND STANDARD DEVIATIONS
FOR VARIABLES EXAMINED

	Mean	Standard Deviation	Range
SIRS	25.39	26.23	0 - 175
SRRQ	190.07	129.17	27 - 689
STAIC	54.91	32.23	1 - 100
CSCS	51.13	31.27	1 - 100
PEER CHOICE	6.90	5.04	0 - 26
PARENTS	1.83	.50	0 - 2
SIBLINGS	1.27	.93	0 - 4

BIBLIOGRAPHY

BIBLIOGRAPHY

Alexander, F. Psychosomatic medicine: Its principles and applications. New York: Norton, 1950.

Andrews, G., Tennant, C., Hawson, D. M., & Viollant, G. E. Life event, stress, social support, coping style and risk of psychological impairment. Journal of Nervous and Mental Disease, 1978, 166, 307-316.

Austin, M. C., & Thompson, G. G. Children's friendships: A study of bases on which children select and reject best friends. Journal of Educational Psychology, 1948, 39, 101-116.

Barnett, D. W., & Zucker, K. P. An exploration into children's interpersonal behavior as related to their perceptions of social interactions. Psychology in the Schools, 1978, 10, 61-66.

Bedell, J. R. Life stress and psychological and medical adjustment of chronically ill children. Journal of Psychosomatic Research, 1977, 21, 237-242.

Bentler, P. M. In O. K. Buros (Ed.), The seventh mental measurement yearbook (Vol. 2). Highland Park, New Jersey: Gryphon Press, 1972, 7, 124.

Bonney, M. E. Personal communication, 1981.

Bosowitz, H., Persky, H., Korchin, K. S., & Grinker, R. R. Anxiety and stress. New York: McGraw-Hill, 1955.

Bott, E. Family and social networks. London: Tarristock Publications, 1971.

Boyce, W. T. Influence of life events and family routines on childhood respiratory tract illness. Pediatrics, 1977, 60, 609-615.

Bradley, F. D., & Newhouse, R. C. Sociometric choice and self perceptions of upper elementary school children. Psychology in the Schools, 1975, 12, 219-221.

Bramwell, S. T., Masuda, M., Wagner, N. N., & Holmes, T. N. Psychological factors in athletic injuries: Development and application of the social and athletic readjustment rating scale (SARRA). Journal of Human Stress, 1975, 1, 6-20.

Branch, C. H. Aspects of anxiety. 2nd ed. Philadelphia: J. B. Lippincott Company, 1968.

Briggs, D. C. Your child's self-esteem. Garden City, New York: Doubleday and Company, 1975.

Brookover, W. B., & Gottlieb, D. A sociology of education. New York: American Book Company, 1964.

Brown, G. W., & Birley, J. D. T. Crises and life changes and the onset of schizophrenia. Journal of Health and Social Behavior, 1968, 9, 203-214.

Buros, O. K. The seventh mental measurements yearbook (Vols. 1 and 2). Highland Park, N.J.: Gryphon Press, 1972.

Buros, O. K. The eighth mental measurements yearbook (Vol. 1). Highland Park, N.J.: Gryphon Press, 1978.

Byrne, D., & Griffitt, W. A developmental investigation of the law of attraction. Journal of Personal and Social Psychology, 1966, 4, 699-703.

Cannon, W. B. Bodily changes in pain, hunger, fear and rage. New York: D. Appleton and Company, 1929.

Caplan, R. D. Organizational stress and individual strain: A sociopsychological study of risk factors in coronary heart disease among administrators, engineers and scientists. Unpublished doctoral dissertation, University of Michigan, 1972.

Caplan, J. Support systems and community mental health. New York: Behavioral Publications, 1974.

Cassell, J. The contribution of the social environment to host resistance. American Journal of Epidemiology, 1976, 104, 107-123.

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

Coddington, R. D. The significance of life events as etiologic factors in the diseases of children. Journal of Psychosomatic Research, 1972, 16, 1-18.

Coddington, R. D. The significance of life events as etiologic factors in the disease of children--II: A study of a normal population. Journal of Psychosomatic Research, 1972, 16, 205-213.

Cofer, C. N., & Appley, M. H. Motivation: Theory and research. New York: John Wiley and Sons, 1964.

Combs, C. Perception of self and scholastic underachievement in the academically capable. Personnel and Guidance Journal, 1964, 43, 47-51.

Cook, T. P. The relationship between self-esteem and interpersonal attraction in children. Journal of Genetic Psychology, 1978, 132, 149-150.

Coopersmith, S. The antecedents of self-esteem. San Francisco: W. H. Freeman and Company, 1967.

Cowen, E. L., Zax, M., Klein, R., Izzo, L. D., & Frost, D.A. The relation of anxiety in school children to school record, achievement, and behavioral measures. Child Development, 1965, 36, 685-695.

Cox, T. Stress. Baltimore: University Park Press, 1978.

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

de Araujo, P. P. van Arsdel, Holmes, T. H., & Dudley, D. L. Life change, coping ability and chronic intrinsic asthma. Journal of Psychosomatic Research, 1973, 17, 359-363.

Dodge, D. D., & Martin, W. T. Social stress and chronic illness: Mortality patterns in industrial society. Notre Dame, Indiana: University of Notre Dame, 1970.

Dohrenwend, B. S. Social status and stressful life events. Journal of Personality and Social Psychology, 1973, 28, 225-235.

Dohrenwend, P. S., & Dohrenwend, B. P. Class and race as status related sources of stress. In S. Levine and N. A. Scotch (Eds.), Social stress. Chicago: Aldine Publishing Company, 1970, pp. 111-140.

Dohrenwend, Barbara Snell & Dohrenwend, Bruce P. Stressful life events: Their nature and effects. New York: John Wiley and Sons, 1974.

Eaton, W. W. Life events, social supports and psychiatric symptoms: A re-analysis of the New Haven data. Journal of Health and Social Behavior, 1978, 19, 230-234.

Edwards, M. K. Life crisis and myocardial infarction. Unpublished Master of Nursing thesis, University of Washington, Seattle, 1971.

Endler, N. S. In O. K. Buros (Ed.), The eighth mental measurements yearbook (Vol. 1). Highland Park, New Jersey: Gryphon Press, 1979, 8, 685.

Felker, D. W., Stanwyck, D. J., & Kay, R. S. The effects of a teacher program in self-concept enhancement on pupils' self-concept, anxiety and intellectual achievement responsibility. Journal of Educational Research, 1978, 66, 443-445.

Fey, W. F. Acceptance by others and its relation to acceptance of self and others: A revaluation. Journal of Abnormal Social Psychology, 1955, 60, 274-276.

Fisher, W. F. Theories of anxiety. New York: Harper and Row Publishers, 1959.

Forssman, H., & Thuwe, I. One hundred and twenty children born after application for therapeutic abortion refused. Acta Psychiatry Scandanavia, 1966, 42, 71-88.

Froberg, J., Karlsson, C. G., Leui, L., & Lidberg, L. Physiological and biochemical stress reactions induced by psychosocial stimuli. In L. Leui (Ed.), Society, stress and disease: The psychosocial environment and psychosomatic diseases. New York: Oxford University Press, 1971, pp. 280-295.

Galluzzi, E. G., & Zucker, K. P. Level of adjustment and the self-and-other-concepts. Psychology in the Schools, 1977, 14, 104-108.

Garrity, T. F., Marx, M. B., & Somes, G. W. The relationship of recent life change to seriousness of later illness. Journal of Psychosomatic Research, 1978, 22, 7-11.

Gersten, J. C., Langer, T. S., Eisenberg, J. G., & Simcha-Fagan, O. An evaluation of the etiologic role of stressful life-events in psychological disorders. Journal of Health and Social Behavior, 1977, 18, 228-244.

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

Gitter-Cohen, B. J. The relationship of significant life events and physical illness in children. Unpublished doctoral dissertation, California School of Professional Psychology, 1978.

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

Greene, W. A., & Miller, G. Psychological factors and reticuloendothelial disease. Psychosomatic Medicine, 1958, 10, 124-144.

Guardo, C. J. Sociometric status and self-concept in sixth-graders. Journal of Educational Research, 1969, 62, 320-322.

Harris, J. L. Imagery, self-concept, anxiety and stress as predictors of seriousness of disease. Unpublished doctoral dissertation, North Texas State University, 1980.

Heisel, J. S. Life changes as etiological factors in juvenile rheumatoid arthritis. Journal of Psychosomatic Research, 1972, 16, 411-420.

Heisel, J. S. The significance of life events as contributing factors in the diseases of children. Journal of Pediatrics, 1973, 83, 119-123.

Henderson, A. S. The social network, support and neurosis: The function of attachment in adult life. British Journal of Psychiatrics, 1977, 131, 185-191.

Hinkle, L. E., Jr. The effects of exposure to culture change, social change in interpersonal relationships on health. In B. Dohrenwend and B. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: Wiley, 1974.

Hirsch, B. J. Natural support systems and coping with major life changes. American Journal of Community Psychology, 1980, 8, 78-85.

Holmes, T. Stephenson & Holmes, Thomas H. Short-term intrusions into the life style routine. Journal of Psychosomatic Research, 1970, 14, 121-132.

Holmes, Thomas H., & Masuda, Minoru.   Life change and illness susceptibility.   In B. S. Dohrenwend and B. P. Dohrenwend (Eds.), Stressful life events: Their nature and effects.   New York: Wiley and Sons, 1974, pp. 45-72.

Holmes, Thomas H., & Rohe, Richard M.   The social readjustment rating scale.   Journal of Psychosomatic Research, 1967, 11, 213-218.

Holmes, T. H.   In P. J. Sparer (Ed.), Personality, stress and tuberculosis.   New York: International Universities Press, 1956.

Holmes, T. H., & Hawkins, N. G.   Psychosocial and psychophysiological studies of tuberculosis.   Alaska: Ladd Air Force Base, Arctic Aero-Medical Lab., Project 8-7951, February, 1956.

Horowitz, F. D.   The relationship of anxiety, self-concept and sociometric status among fourth, fifth and sixth grade children.   Journal of Abnormal and Social Psychology, 1962, 65, 212-214.

Jacobs, T. J., & Charles, E.   Life events and cancer in children.   Psychosomatic Medicine, 1980, 42, 11-24.

Justice, Blaire, McBee, George W., & Allen, Richard H.   Life psychological distress and social functioning.   Psychological Reports, 1977, 40, 467-473.

Kagan, A., & Levi, L.   Health and environment-psychosocial stimuli: A review.   Social Science and Medicine, 1974, 8, 225-241.

Kagan, A. R.   Epidemiology and society, stress and disease.   In L. Levi (Ed.), Society, stress and disease: The psychosocial environment and psychosomatic disease.   London: Oxford University Press, 1971, pp. 36-48.

Kagan, J., & Havemann, E.   Psychology: An introduction.   New York: Harcourt Brace Jovanovich, 1980.

Kaplan, D. H., Cassel, J. C., & Gore, S.   Social support and health.   Medical Care, 1977, 15, 23-38.

Kelly, D.   Anxiety and emotions.   Springfield, Illinois: Charles C. Thompson Publisher, 1980.

Knight, R. B. Psychological stress, ego defenses and cortisol production in children hospitalized for elective surgery. Psychosomatic Medicine, 1979, 41, 40-49.

Kumar, S. D., Powars, J. A., & Haywood, L. D. Anxiety, self concept, and personal and social adjustments in children with sickle cell anemia. The Journal of Pediatrics, 1976, 88, 859-865.

Lazarus, R. S. Psychological stress and the coping process. New York: McGraw-Hill, 1966.

Laughlin, R. L. The neuroses in clinical practice. Philadelphia: Saunders, 1956.

Leavitt, F., Garron, D. C., & Bieleauskas, L. A. Psychological disturbance and life event differences among patients with low back pain. Journal of Consulting and Clinical Psychology, 1980, 40, 115-116.

Levy, L., & Rowitz, L. The ecology of mental disorder. In S. E. Goldston (Ed.), Mental health considerations in public health. Washington, D.C.: Government Printing Office, 1969.

Levy, L., & Rowtiz, L. The ecology of mental disorder. New York: Behavioral Publications, 1973.

Lewis, A. Problems presented by the ambiguous word "anxiety" as used in psychopathology. Psychiatry, 1967, 5, 105-110.

Lewis, J., & Adank, R. Intercorrelations among measures of intelligence, achievement, self-esteem and anxiety in two groups of elementary school pupils exposed to two different models of instruction. Educational and Psychological Measurement, 1975, 35, 499-501.

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

Linsky, A. Who shall be excluded: The influence of personal attributes in community reaction to the mentally ill. Social Psychiatry, 1970, 5, 166-171.

Lowenthal, M. E., & Haven, C. Interaction and adaptation: Intimacy as a critical variable. American Sociological Review, 1968, 33, 20-30.

McCandless, B. R., Castaneda, A., & Palermo, D. D. Anxiety in children and school status. Child Development, 1956, 27, 385-391.

McGrath, J. E. (Ed.). Social and psychological factors in stress. New York: Holt, Rhinehart & Winston, Inc., 1970.

McIntyre, A., Lounsbury, K. R., Hamilton, M. L., & Mantooth, J. M. Individual differences in preschool object play: The influence of anxiety proneness and peer affiliation. Journal of Applied Developmental Psychology, 1980, 1, 149-161.

McNeil, N. E., & Rubin, L. The psychology of being human. New York: Canfield Press, 1977.

McNelly, F. W. Development of self concept in children. Michigan University, Ann Arbor, Department of Psychology, ED 086 318.

Manuck, S. B., Hinrichsen, J. J., & Ross, E. O. Life stress, locus of control, and state and trait anxiety. Psychological Reports, 1975, 36, 413-414.

Many, M. A., & Many, W. A. The relationship between self-esteem and anxiety in grades four through eight. Educational and Psychological Measurement, 1975, 35, 1017-1021.

Martinez, A. Acculteration, imagery, self-concept, anxiety and stress as predictors of disease in Mexican Americans. Unpublished doctoral dissertation, North Texas State University, 1981.

Mattson, A., & Gross, S. Social and behavioral studies on hemophilic children and their families. Journal of Pediatrics, 1966, 68, 952-961.

Mechanic, D. Medical sociology: A selective view. New York: Free Press, 1968.

Meyer, Adolf. The life chart and the obligation of specifying positive data in psychopathological diagnosis. In E. E. White (Ed.), The collected papers of Adolph Meyer. Baltimore: The Johns Hopkins Press, 1951, pp. 52-56.

Meyer, R. J., & Haggerty, R. J. Streptococcal infections in families. Pediatrics, 1962, 29, 539-549.

Mitchell, J. C. (Ed.). Social networks and urban situations. Manchester: Manchester University Press, 1969.

Monat, A., & Lazarus, R. S. Stress and coping. New York: Columbia University Press, 1977.

Montgomery, L. E., & Finch, A. J., Jr. Validity of two measures of anxiety in children. Journal of Abnormal Child Psychology, 1974, 2, 293-298.

Moss, G. E. Illness, immunity and social interaction. New York: John Wiley and Sons, 1973.

Myers, J. K., Lindenthal, J. J., & Pepper, M. P. Life events and psychiatric impairments. Journal of Nervous and Mental Disease, 1971, 152, 149-157.

Nuckolls, C., Cassell, J., & Kaplan, B. Psychosocial assets, life crises and the prognosis of pregnancy. American Journal of Epidemiology, 1972, 95, 431-441.

Paykel, E. S., Myers, J. K., Dunett, M. H., Klerman, G. L., Linderthal, J. J., & Pepper, M. P. Life events and depression. Archives of General Psychiatry, 1969, 21, 753-760.

Piers, E. V., & Harris, D. B. Age and other correlates of self-concept in children. Journal of Educational Psychology, 1964, 55, 91-95.

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

Rahe, Richard H. Life-change measurement as a predictor of illness. Proceedings of the Royal Society of Medicine, 1968, 61, 1124-1126.

Rahe, Richard H., & Lord, E. Psychosocial factors and sudden cardiac death: A pilot study. Journal of Psychosomatic Research, 1971, 15, 19-24.

Rahe, Richard H., & Paasikiui, J. Psychosocial factors and myocardial infarction II: An out-patient study in Sweden. Journal of Psychosomatic Research, 1971, 15, 33-39.

Rahe, R. H. Subjects' recent life changes and their near-future illness reports: A review. Annals of Clinical Research, 1972, 4, 393-397.

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

Rahe, R. H., Mahan, J. L., & Arthur, R. J. Prediction of near-future health change from subjects' preceding life changes. Journal of Psychosomatic Research, 1970, 14, 401-405.

Reavely, W. The relationship of life events to several aspects of anxiety. Journal of Psychosomatic Research, 1974, 18, 421-424.

Reese, M. W. Manifest anxiety and achievement test performance. Journal of Educational Psychology, 1961, 52, 132-135.

Richmond, B. O., & White, W. F. Sociometric predictors of the self-concept among fifth and sixth grade children. Journal of Educational Research, 1971, 64, 425-429.

Rothman, L. Vulnerability of children to accidental injury as related to family system stress, mother's coping skill and the behavioral style of the accident-involved child. Unpublished doctoral dissertation, California School of Professional Psychology, 1976.

Rubin, R. T., Gunderson, E. K. E., & Arthur, R. J. Life stress and illness patterns in the U.S. Navy. III. Prior life change and illness onset in an attack carrier's crew. Archives of Environmental Health, 1969, 19, 753-757.

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

Sandler, I. N., & Block, M. Life stress and maladaptation of children. American Journal of Community Psychology, 1979, 7, 425-440.

Sarason, S. B., Davidson, K. S., Lighthall, F. F., Waite, R. R., & Rucbush, B. K. Anxiety in elementary school children. New York: John Wiley and Sons, Inc., 1960.

Scott, R. A., & Howard, A. Models of stress. In S. Levine and H. A. Scotch (Eds.), Social stress. Chicago: Aldine, 1970.

Selye, H. The stress of life. New York: McGraw-Hill, 1956.

Selye, H. The evolution of the stress concept--stress and cardiovascular disease. In L. Levi (Ed.), Society, stress and disease: The psychosocial environment and psychosomatic disease. London: Oxford University Press, 1971, pp. 299-344.

Sheridan, M. S., & Kline, K. Psychosomatic illness in children. Social Casework, 1978, 59, 227-232.

Spielberger, C. D., Gorsuch, R. B., & Lushine, R. F. The State-trait Anxiety Inventory Test Manual Form X. Palo Alto, California: Consulting Psychologists Press, 1970.

Spielberger, C. D. Anxiety: Current trends in theory and research. New York: Academic Press, 1972.

Spielberger, C. D., & Diaz-Guerrero, R. Cross cultural anxiety. New York: John Wiley & Sons, 1976.

Spielberger, C. D. Manual for the State Trait Anxiety Inventory for Children. Palo Alto, California: Consulting Psychologists Press, 1973.

Stein, S. P., & Charles, E. Emotional factors in juvenile diabetes melliture: A study of early life experiences of adolescent diabetics. American Journal of Psychiatry, 1971, 128, 56-60.

Stein, Z., & Susser, M. Social factors in the development of spincter control. Developmental Medicine and Childhood Neurology, 1967, 9, 692-706.

Stock, D. An investigation into the interrelations between the self concept and feelings directed toward other persons and groups. Journal of Consulting Psychology, 1949, 13, 176-180.

Sturner, R. A., Rothbaum, F., Visintainer, M., & Wolfer, J. The effects of stress on children's human figure drawings. Journal of Clinical Psychology, 1980, 36, 324-331.

Suinn, R. M., & Hill, H. Influence of anxiety on the relationship between self-acceptance and acceptance of others. Journal of Consulting Psychology, 1964, 28, 116-119.

Sullivan, H. S. The interpersonal theory of psychiatry. New York: Norton, 1953.

Theorell, T., & Rahe, R. H. Psychosocial factors and myo-
cardial infarction: An inpatient study in Sweden.
Journal of Psychosomatic Research, 1971, 15(1), 25-31.

Theorell, T., Lind, E., Froberg, J., Karlsson, C. G., &
Levi, L. A longitudinal study of 21 subjects with
coronary heart disease: Life changes, catecholamine
excretion and related biochemical reactions.
Psychosomatic Medicine, 1972, 34, 505-516.

Thurlow, H. J. Illness in relation to life situations and
sick-role tendency. Journal of Psychosomatic Research,
1971, 15, 73-88.

Tolsdorf, C. Social networks, support and coping: An
exploratory study. Family Process, 1976, 15, 407-417.

Videbeck, R. Self-conception and the reaction of others.
Sociometry, 1960, 23, 351-359.

Wan, T. T. H., & Livieratos, D. Interpreting a general
index of subjective well-being. Milbank Memorial Fund
Quarterly/Health and Society, 1978, 56, 531-556.

Weiss, E., Dlin, B., Rollin, R. R., Fischer, H. R., &
Bepler, C. R. Emotional factors in coronary occlusion.
Archives of Internal Medicine, 1957, 99, 628-641.

Williams, J. E. Acceptance of others and its relationship
to acceptance of self and others. A repeat of Fey's
study. Journal of Abnormal and Social Psychology,
1962, 65, 438-442.

Wolf, S., & Goodell, H. (Eds.). Harold G. Wolff's stress
and disease. Springfield, Illinois: Thomas, 1968.

Wolff, R. G. Stress and disease. Springfield, Illinois:
Charles C. Thomas, 1953.

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

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