Order Number 9218239

Job stress perception: Measuring individual propensity

Iorizzo, Linda Margaret, Ph.D.

City University of New York, 1992

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

JOB STRESS PERCEPTION:
Measuring Individual Propensity

by Linda M. Iorizzo

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The City University of New York.

1992

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Jan. 13, 1992
Date

Joel Lefkowitz, Ph.D.
Chair of Examining Committee

January 21, 1992
Date

Herbert D. Saltzstein
Herbert Saltzstein, Ph.D.
Executive Officer

Walter Reichman, Ed.D.
Sheldon Zalkind, Ph.D.
Supervisory Committee

Roger Millsap, Ph.D.
Gerald Rosen, Ed.D.
Outside Readers

The City University of New York

Abstract

JOB STRESS PERCEPTION:

MEASURING INDIVIDUAL PROPENSITY

by

Linda M. Iorizzo

Adviser: Professor Joel Lefkowitz

A great deal of organizational research has been conducted on the topic of stress. However, much of that research has confused the definition of stress with its antecedents and consequences. By referencing the authors that directly explore the definition of stress, one concludes that stress is embedded in a process of antecedents — stress — consequences, and that stress is the perception of a personally relevant situation as ambiguous. The notion of stress as a perception is explored in this research. A new — perceptual — measure of stress (The Propensity to Perceive Stress [PPS]) is developed and tested. The model of

antecedents — stress — consequences is also explored.

Three hundred eighty-nine applicants for New York City civil service jobs served as the subjects in this study. A naturally anxiety producing test situation was used as the test anxiety measure. Subjects were asked to complete a questionnaire measuring life satisfaction, job alienation — involvement, stress symptoms, negative and positive affectivity, and perceptual stress. Correlational, factor and path analyses were performed.

Results of the factor analysis seem to suggest that the proposed new stress measure appears to be measuring stress. The reliability and validity of this new measure are good. The concept of stress as a process composed of antecedents — stress — consequences was also supported. Results indicated that negative affectivity and stress were separate concepts. The predicted relationships between PPS and its antecedents and consequences were supported.

TABLE OF CONTENTS

List of Tables

LIST OF FIGURES

INTRODUCTION

In the past decade, a plethora of literature has been published on the topic of job stress in the form of books, articles, tapes, videos, etc. This interest stems mainly from evidence of a link between stress and its various negative consequences: increased blood pressure, heart rate, cholesterol level, absenteeism, turnover, and anxiety, and decreased job performance and satisfaction (Ivancevich, Matteson, and Preston, 1982; Jamal, 1984). While a mass of literature exists, surprisingly little is known regarding this construct. The question remains: What is job stress? Many authors have ventured an answer to this question (cf. Schuler, 1980), however, little agreement exists: is stress a situational reaction to particular environmental circumstances or is it a stable personality characteristic? Is it a behavioral, cognitive, or physiological phenomenon? Is it episodic or chronic? Is stress merely another term for anxiety? All of the preceding alternatives have been included among definitions of stress. Perhaps job stress is a combination of all of the above (and perhaps not). No organizational literature exists that has served to integrate the facets of this construct to achieve greater understanding or to further our knowledge.

We do know that job stress has costly adverse consequences. It is a cost medically and financially as well as psychologically, and it is a cost behaviorally in terms of lowered production, and increased absence and turnover.

For so vital a topic, it is unfortunate that, in the area of organizational psychology, we know little more today than was known when the topic was first introduced in 100 A.D.

Interest in stress by the general populace as well as by professionals in many fields, has fostered the emergence of this topic in the field of industrial-organizational psychology. Unfortunately, we are as negligent as others in that we have not used the evidence and resources of other subfields of psychology to aid our understanding of this topic. Lack of integrated conceptualization is exemplified in the measurement research. If stress can be conceptualized as having physiological, behavioral and perceptual components, one might conclude that all of these components should be taken into consideration when we measure stress thus forming a multidimensional view of the construct. However, while many theorists and researchers agree that individual differences (mainly perceptual) exist with regard to stressful reactions, none have included this perceptual component in their unidimensional physiological or behavioral measures (cf. Quick & Quick, 1983) neither has anyone adequately measured this concept of stress as a perception alone.

Based on a review of much of the organizational literature, it can be concluded that stress is a process comprised of three phases: antecedent causes, stress, and consequent reactions. The antecedent causes are generally known as stressors. The reactions may be grouped into physiological, psychological and behavioral components. Stress itself may be conceptualized as separate and distinct from both antecedents and consequent reactions. This process is affected

by individual differences in personality and cognitions. The stress concept and its definition will be explored here to gain greater insight and understanding of the entire process. Because stress is such a vast topic, this review will be limited to research related to job stress. Many, if not all, of the reviewed articles were obtained from organizational journals.

CHAPTER 1

Stress: An Historical Precis

Stress: a Physiological Perspective

Selye (1956) dates awareness of stress as far back as 100 A.D. He indicated that stress was thought of as a force or push on the body which could act as a curative for diseases. Stress was related to the notion of homeostasis, e.g. force and resistance. Later, in the 17th Century, Hooke defined stress as "the ratio of internal force...to the area over which the force acted" (Lazarus & Folkman, 1984 p.2). Walter Cannon in 1932 likened stress to a disturbance of homeostasis (ibid). In 1936, Hans Selye developed the first "theory" of stress which he called the **General Adaptation Syndrome**. This syndrome is composed of three (physiological) phases: (1) the alarm reaction, (2) the stage of resistance, and (3) the stage of exhaustion. The alarm reaction can be defined as "a generalized call to arms of the defensive forces in the organism" (Selye, 1956, p. 31). Selye believed that stress was a purely physiological reaction. That is, the cells of the adrenal cortex secrete granules into the blood stream thereby depleting the gland at the same time the individual becomes alarmed by a situation. Selye realized that no human could remain in the alarm state without serious damage to the depleted adrenal gland. He reasoned, therefore, that there must be some counter action such as a physiological resistance to this alarm. At this second stage of

resistance, the individual struggles toward equilibrium and begins adapting to (coping with) the situation. Physiologically, the adrenal cortex accumulates a reserve of granules to balance the depletion. Eventually, after prolonged exposure to this noxious stimulus and consequent resistance, the body becomes exhausted. This is the third phase of the syndrome. Selye indicated that only severe stress leads to the third stage.

Hans Selye's research on stress has had a vast impact on advancing this notion and encouraged subsequent investigation by other researchers. Lazarus and Folkman (1984) indicate "Selye's work and its spinoffs have played a dominant role in the recent expansion of interest in stress" (p. 52). It should be noted that Selye's ideas regarding stress established that stress can result in adverse physiological consequences.

Wolff (1953) emphasized the "dynamic state" of stress. He defined stress as a fight to restore equilibrium. That is, in the biological sense, our bodies constantly struggle to maintain an equilibrium. This state of equilibrium is facilitated by **adaptation**. (Adaptation may be thought of as the physiological equivalent of psychological coping).

During the Korean War, many new studies were directed at the effects of stress on adrenal-cortical hormones and skilled performance. Researchers were searching for methods of selecting less stress-vulnerable combat personnel and ways to improve their functioning while under stress.

During the Vietnam War focus shifted to the examination of the physiological effects of stress in the form of bombings, manipulation of military prisoners and concentration camps (Lazarus & Folkman, 1984).

Currently the field of psychosomatic medicine in which strong support is given to the general consensus that social and psychological factors, such as stress, are important in health and illness, is being given a great deal of attention.

> "Psychophysiology and medicine...have moved away from the view that disease is strictly a product of environmental agents such as bacteria, viruses, and damaging accidents and toward acceptance of the idea that vulnerability to disease or 'host resistance' is also important" (Lazarus & Folkman, 1984, p.8).

Specifically, research on the effects of stress on the bodily tissues has changed many researcher's opinions regarding psychosomatic medicine (Mason, 1971). Lazarus and Folkman (1984 p.8) indicate "Current psychosomatic thought is...heavily imbedded in stress theory and research". This psychosomatic approach represents the merging of two disciplines (psychodynamic and physiological) forming a more interdisciplinary approach to the study of stress (Lazarus & Folkman, 1986).

The future of physiology and stress research is in an extension of psychosomatic medicine: the immune response (ibid). That is, are individuals under a great deal of stress more likely to suffer from illnesses such as cancer, AIDS, etc?

Stress: a Psychological Perspective

When considering psychological aspects of stress, two concepts are often mentioned: alienation and anxiety.

Alienation

Concomitant with developments in the physical sciences, sociologists and psychologists were investigating the effects of stress. Durkheim (1893) wrote about "alienation"-- a condition of anomie due to lack of norms which prescribe behavior. Such a condition is related to our current concept of stress. Seeman (1959, 1971) described alienation as powerlessness, normlessness, meaninglessness, isolation and self-estrangement. Lazarus and Folkman (1984) point out that Seeman's conceptualization clearly places "alienation under the general rubric of stress" (p. 4). More recently, alienation has been investigated as it relates to work (Lefkowitz, Somers & Weinberg, 1986).

Sociologists have investigated stress as it relates to riots, panics, and natural disaster (Baker & Chapman, 1968); examination stress (Mechanic, 1978); and working under water (Helmreich, 1968). It should be noted that sociologists use the term strain when referring to stress in their research. This is an example of confusion in use of the term.

Anxiety

Stress played a major role in the study of individual psychology. However, in this area stress was known as anxiety. The word stress did not appear in the index of Psychological Abstracts until 1944. However, in retrospect, the psychoanalytic notion of "anxiety" seems analogous to our current notions regarding stress.

Freud (1924) used the term "anxiety" to describe an unpleasant emotional state or condition. He posited that anxiety represents "all that is covered by the word nervousness" (cf. Spielberger, 1973, p. 114). According to Freud, anxiety results in physiological symptoms such as nausea, heart palpations, sweating, etc.

> "Anxiety was distinguishable from other unpleasant states, such as anger or depression by its unique combination of phenomenological and physiological qualities, which gave it a special character of unpleasure" (Spielberger, 1973, p. 116).

Originally, Freud believed that anxiety resulted from repressed sexual tensions. Later he revised his conceptualization and defined anxiety as a signal to indicate the presence of danger thereby triggering defense mechanisms (i.e. coping). He believed that there were two types of anxiety: objective and neurotic. Objective anxiety is a real fear of external danger. Neurotic anxiety "is the end product of a complex process in which internal [sexual] impulses evoke an anxiety reaction that signals the danger of further punishment if the [sexual]

impulses are expressed" (Spielberger, 1973, p. 117). Freud never discussed a distinction between anxiety and stress.

Mowrer (1939) applied Freud's notion about anxiety to learning theory. He reasoned that anxiety and fear were synonymous and that both were conditionable.

In 1950, Hoch and Zubin stated:

> "Although anxiety is the most pervasive psychological phenomenon of our time and the chief symptom in the neurosis and in functional psychoses, there has been little or no agreement on its definition, and very little, if any progress in its measurement" (p. 5).

The current status of an anxiety definition has not changed much since 1950. Additionally, most researchers are noticeably silent in offering a distinction between stress and anxiety when studying either concept. In many cases anxiety and stress are considered synonymous. However, it is important to distinguish between these two concepts in order to gain greater insight into the definition of stress. Spielberger (1973) implies that anxiety is a consequence of stress:

> "It is widely accepted that most people respond to stressful situations with increased anxiety and that anxiety reactions are characterized by feelings of apprehension, tension, and activation of the autonomic nervous system" (p. 129).

Phillips and Endler (1982) support Spielberger's distinction:

> "Stress refers to the individual's subjective appraisal (or perception) of the situation as physically or psychologically dangerous...[anxiety] now defines the emotional reaction and response pattern which results from the person's appraisal of the situation as threatening" (p.304).

This distinction is adopted and will be elaborated upon in the current research. Stress entails a perceptual-evaluative process while anxiety is the emotional *reaction* to stress.

Recent Developments in Stress Research

Recent interest in stress suggests that there may be individual perceptual differences in reactions to stressful situations. "People could differ in their optimal level of arousal, or in the ways they [cognitively] appraised the encounter or coped with its demands" (Lazarus & Folkman, 1984, p. 7). Lazarus and Erikson (1952) found differences in performance under stress conditions. This and other studies made it clear that performance in stressful situations was not easily predicted. This realization of the importance of personal factors caused many researchers to examine the possible effects of mediating or moderating variables.

Models of Stress

French and Caplan (1972) developed a relatively simple model of stress. Occupational stressors such as role conflict and role ambiguity cause

physiological strains such as tension, dissatisfaction, smoking, low self-esteem, etc. These, in turn, lead to such health consequences as coronary heart disease. Additionally, they add that the stressor-strain relationship is moderated by personality attributes in the form of abilities, needs, etc. (see figure 1 below).

Drawbacks of the French & Caplan model:

1-Psychological and physiological strains described here are what are commonly known as reactions to stressful situations.

2-Coronary heart disease is the only result of the "strains". This is clearly a limitation. Psychological and behavioral results should be added.

3-Why is coronary heart disease separated from strains? Are they not both consequences of stress? Perhaps they are separated because coronary heart disease is a longer-term effect (more distal) than the strains. This should be clarified.

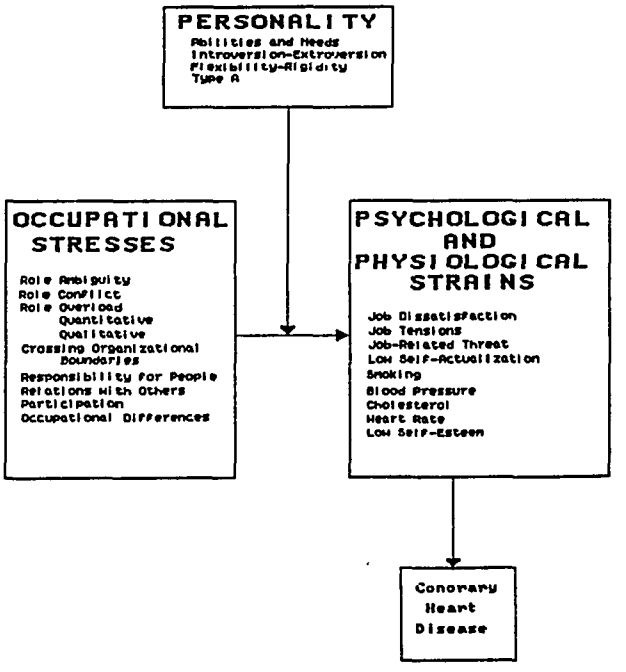

FIGURE 1
THE FRENCH and CAPLAN MODEL OF STRESS
1972

Kahn, Wolfe, Snoek and Rosenthal (1964) developed a model of organizational stress embedded in role theory (see figure 2, below). The role conceptions and behavior of the "focal person" are determined by "role senders". These "role senders" are influenced by organizational, interpersonal and personality factors.

Drawbacks of this Model:

1-This is more a model of role issues (discussed in detail in chapter 3) rather than a model of stress.

2-It is not clear where stress is in this model. The authors' definition needs to be clearly explained.

3-This is not general enough to be applied to many situations.

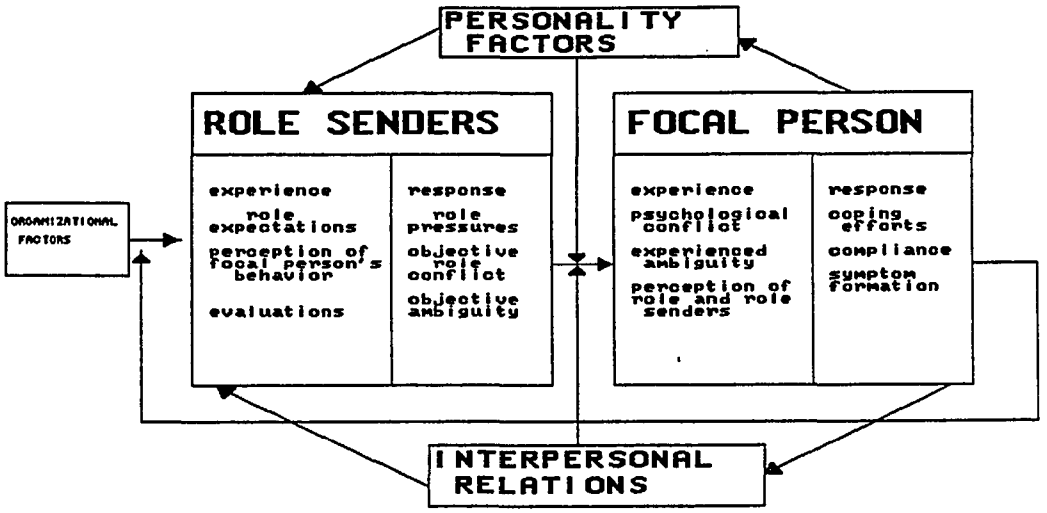

FIGURE 2

The Kahn, et.al. 1964 Model of Stress

Dijkhuizen (1974) integrated the above two models to form yet a third model in which objective situational stressors lead to subjective stressors which in turn lead to psychological strains. (see figure 3, below) These relationships are mediated by personality characteristics.

Drawbacks of this Model:

1-In this model strains are really consequences of stress.

2-Why are objective and subjective stresses separated in this Model if they are both affected by the same personality variables and result in the same consequences?

3-Again, how is stress defined in this model?

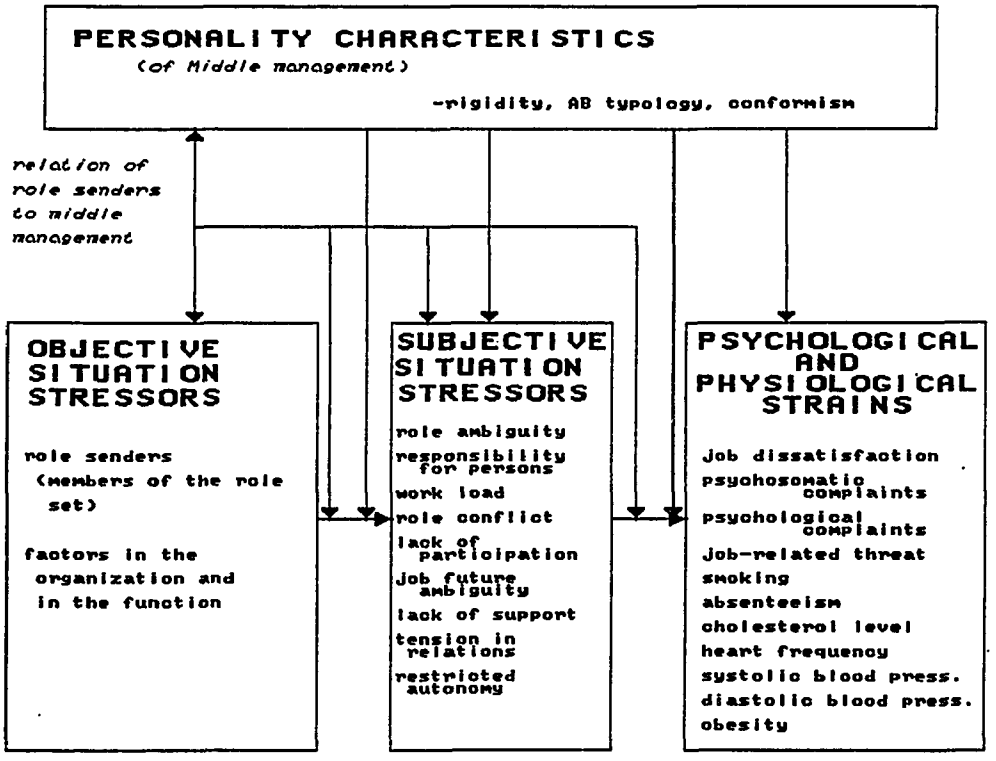

FIGURE 3 The Dijkhuizen, 1974 Model of Stress

Drawbacks of all the Models

1-None of the three models distinguishes between stress and stressors.

2- Each of these models offer the conceptualization of stress as a process but none adequately defines stress or distinguishes between stress and stressors.

3- All of the models need simplification to achieve greater clarity and ease of application.

4-Rather than helping to clarify the definition of stress, these models make the situation more confused by not clearly defining stress.

In this chapter, a brief history of stress was offered. The most recent trend in this literature is awareness of and focus on individual differences in reactions to stressful situations. This is true for both the physiological stress literature, which is now moving toward individual immune responses, and in the psychological literature, which is now focusing on the cognitive appraisal of stress.

It can also be concluded from this chapter that some confusion exists regarding the distinction between anxiety and stress, and more generally regarding the definition of stress.

CHAPTER 2

DEFINING STRESS

Defining stress is not an easy task

> "...[I]t has been stated that essentially stress is too all encompassing a phenomenon, too large to investigate. Compounding and perpetuating this view of stress is the fact that stress remains a term without conceptualization and without definitional and operational agreement ...Indeed, several authors suggest that the stress concept should be relegated to a secondary position behind a more general framework of stress research" (Schuler, 1980, p. 187). "In many ways, assessing stress is tantamount to measuring the totality of life--the moment-to-moment flow of awareness in a highly complex and constantly changing social and physical milieu" (Monroe & Peterman, 1988 p. 32).

The present author selected a sample of 12 recent studies related to organizational stress and examined their theoretical and operational definitions. All studies were conducted in the last decade and an attempt was made to sample a variety of relevant organizational journals.

Parasuraman and Alutto (1981) studied sources of stress in the work environment. They offer no conceptual definition of stress. The operational definition of stress was a self-report survey tapping the stressors of interunit conflict, technical problems, efficiency problems, role frustration, staff

shortages, and too many meetings. The authors are not measuring stress, rather, they are measuring negative stressors.

Ivancevich, Matteson and Preston (1982) investigated the relationship between type A, organizational stress and well being. Their conceptual definition of stress is "negative environmental factors or stressors (e.g. work overload, role conflict) associated with a particular job" (p.374). The operational definition of stress was a self-report questionnaire tapping work overload, lack of career progression, family situation, supervisor relations, and role conflict. While the conceptual and operational definitions of stress match, the authors are measuring stressors not stress.

Abush and Burkhead (1984) examined job stress in midlife working women. They do not offer a conceptual definition of stress. Stress was operationally defined using the Job Tension Index (a self-report questionnaire). The authors indicate this scale is *associated with* measures of job dissatisfaction, role conflict, ambiguity and neurotic symptoms. They do not indicate what this scale *measures.* Not enough information is given to form conclusions regarding what these authors are indeed measuring.

Berkowitz and Perkins (1984) examined stress among farm women. The authors do not offer a conceptual definition of stress. Their operational definition of stress was a self-report scale measuring "psychological and physiological symptoms associated with the stress response" (p. 163) The authors are actually measuring consequences of stress rather than stress itself.

Jayaratne and Chess (1984) examined the effects of emotional support on job stress. No conceptual definition of stress is offered. The operational definition of stress was self-report measures of amount of experienced role ambiguity and conflict. The authors are measuring stressors rather than stress.

Martin (1984) investigated the effect of job stress, which he first defined as the inability to leave, on health problems. He later describes the inability to leave as a source of job stress and defines job stress as "results from a variety of extreme or noxious conditions created within or associated with one's job environment" (p. 170) This appears to be a definition of a consequence of exposure to stressors. Job stress was operationally defined as role overload, role ambiguity, employee participation, equity, group support and inability to leave. "An employee's inability to leave was defined as a situation in which the employee had little behavioral discretion or choice about leaving his or her job" (p.974). Martin's theoretical definition describes a consequence of stress (i.e. results from) whereas his operational definition involves stressors. Additionally, these stressors are clearly negative.

Rhodewalt, Hays, Chermers & Wysocki (1984) examined the relationship between Type A, stress and illness. Their conceptual definition of stress is "the perception of that event as undesirable or less than totally controllable" (p. 150). The operational definition of stress was a self-report rating of the amount of stress experienced regarding the supervisor, coworkers, subordinates and tasks. The operational definition is a measure of the amount

stressors NOT the perception of an event as undesirable or uncontrollable. The operational and conceptual definitions do not coincide. Additionally, stress is conceptualized and operationalized as exclusively negative.

Chmers, Hays, Rhodewalt & Wysocki (1985) examined the relationship between person-environment fit and stress. Their theoretical definition of stress is "stress arises from a poor match between characteristics of the individual employee and the job situation " (p. 628). This definition does not consider personality, stressors /antecedents or consequences of stress. Their operational definition of stress was a self-report questionnaire-type "measure(s) designed to assess a variety of personality and situational factors thought to be related to job stress" (p.630). The operational definition does not appear to match the theoretical definition. The operational definition includes personality and antecedent variables which the theoretical definition does not. The authors do not include positive stressors.

Hendrix, Ovalle and Troxler (1985) examined the behavioral and psychological consequences of stress. They propose a model of stress which fits the general antecedent-stress-consequent reaction notion. They include personality or individual difference variables as an antecedent. They do not give a conceptual definition of stress. The operational definition of job stress was "a scale reflecting the extent that individuals felt their jobs overall to be stressful and the degree the jobs produced stress by thwarting personal growth" (p. 194). The authors do not describe the items in this scale clearly or carefully enough for the reader to really understand what is being proposed.

Marino and White (1985) examined the relationship between mechanistic structural organizational characteristics (such as hierarchy of authority, job codification and lack of participation in decision making) and job stress. The authors' conceptual definition of stress is "stress is expected when beliefs about the location of control and perceived freedom to take action are incongruent" (p. 782). Essentially this means that situations over which we have control are experienced as less stressful than those over which we do not have control. Operationally, stress was defined via two self-report scales: "the first scale measures stress induced by the volume of work assigned and the second scale assesses pressure attributable to imposed time and resource limitations" (p.783). Both operational and conceptualization definitions imply that stress is a negative consequence due to lack of control.

Howard, Cunningham and Rechnitzer (1986) examined the role of hardiness as a moderator of job stress and coronary risk. The authors do not offer a conceptual definition of stress. The operational definition of stress was a self-report measure of the amount of role ambiguity. Role ambiguity is a negative stressor NOT stress.

Watson (1988) examined the relationship between affectivity (negative and positive) and stress. He does not give a conceptual definition of stress. His operational definition is responses to the question: "How much stress (e.g. because of hassles, demands) were you under today?" While Watson suggests this is a measure of perceived stress, it can be argued that he is measuring very little with one item and if he is measuring something it is how

many hassles/ demands did you experience today? This is a measure of stressors not perceived stress.

Each of the 12 studies described above has major flaws regarding the definition of stress. These 12 are a microcosm of the existing literature. Many more studies could be described and the same flaws would be obvious. The following three issues are clear from this review.

1- There is ambiguity in the definition of stress- Many authors conceptualize one concept and operationally measure another. Many authors claim to be measuring stress but are actually measuring stressors or consequences of stress.

2- Each fails to acknowledge the possibility of positive stress. All the studies above consider stress to be negative. Greater understanding of this topic will be achieved by incorporating positive and negative stressors.

3- None of the studies include a process orientation- Only a few authors have suggested a distinction between antecedent / stress / consequences. And those that have seem to lose this distinction when measuring stress.

The purpose of the current research is to forge a workable conceptual definition of stress which embraces these points and to complement this definition with an adequate operational measure.

At least one author (Jamal, 1984) presents empirical evidence related to the importance of a constant definition of stress.

> "The nature of the relationship between job stress and performance tends to be a negative linear one, provided stress is operationalized in terms of perceptions of stressors such as role conflict, overload, and resource inadequacy. On the other hand, if stress is measured directly [i.e. not in terms of stressors] or by other methods, then the nature of the relationship between stress and performance is far from conclusive" (p.15).

This finding does not lend confidence to our measures of stress or to our security in making conclusions.

Schuler (1980) also attempted to develop a definition of stress based on a brief review of the literature. He indicates that in the past, stress has been defined as a response (Selye, 1956); a lack of fit between individual and environment (French, Rogers & Cobb, 1974); any threat (Caplan, et.al., 1975); a change (Beehr & Newman, 1978); any negative environmental factor (Cooper & Marshall, 1976); a feeling of discomfort (Parker & DeCotis, 1976); and as perceived external factors (Gavin & Axelrod, 1976). Schuler (1980) points out that these definitions suggest that stress is only negative. However, the inverted U hypothesis suggests that too little stress may be as bad as too much. Schuler therefore, defines stress independent of the negative environment. The environment he suggests "can influence stress by being perceived by the individual as opportunities, constraints and/or demands" (p.189). His definition of stress is:

> "Stress is a dynamic condition in which an individual is:

a- confronted with an opportunity for being/having/doing what (s)he desires and/or;

b- confronted with a constraint on being/having/doing what (s)he desires and/or;

c- confronted with a demand on being/having/doing what (s)he desires and for which the resolution of is perceived to have uncertainty but which will lead (upon resolution) to important outcomes" (p.189).

Schuler defines opportunity, constraint and demand as follows. "An opportunity is a dynamic condition in which an individual may be able to be, have or do what (s)he desires, i.e., a situation of potential gain. A constraint on the other hand, is a dynamic condition in which an individual may be prevented from being, having, or doing what (s)he desires, in essence a potential status quo situation [i.e. no change/improvement when change/improvement is desired]. A demand is a dynamic condition in which what an individual desires to be, have, or desires may be diminished or removed, a potential situation of loss" (p.190).

Schuler indicates that desires vary from individual to individual and reflect needs and values.

The following points can be concluded from Schuler's definition:

1- Stress is a perceptual-cognitive variable-i.e. stress is the perception and appraisal that the resolutions or implications of a personally relevant (important) situation (involving demand, constraint or opportunity) are ambiguous.

2- Stressors in the form of such demands, constraints and/or opportunities are separate and distinct from "stress". These stressors are inputs from the environment which impinge on the individual and have the potential to produce stress.

Now also consider Phillips and Endler's (1982) distinction between stress and anxiety (discussed previously). These authors indicate that stress is a subjective appraisal of a situation whereas anxiety is the emotional reaction to this perception (see Phillips & Endler for a full discussion). Anxiety then is the feeling component to this reaction analogous to an emotional appraisal of the situation. As Freud suggested, anxiety is all that is covered by the term nervousness. Stress is the perceptual component to this reaction analogous to a cognitive appraisal of the situation. Consider figure 4 below:

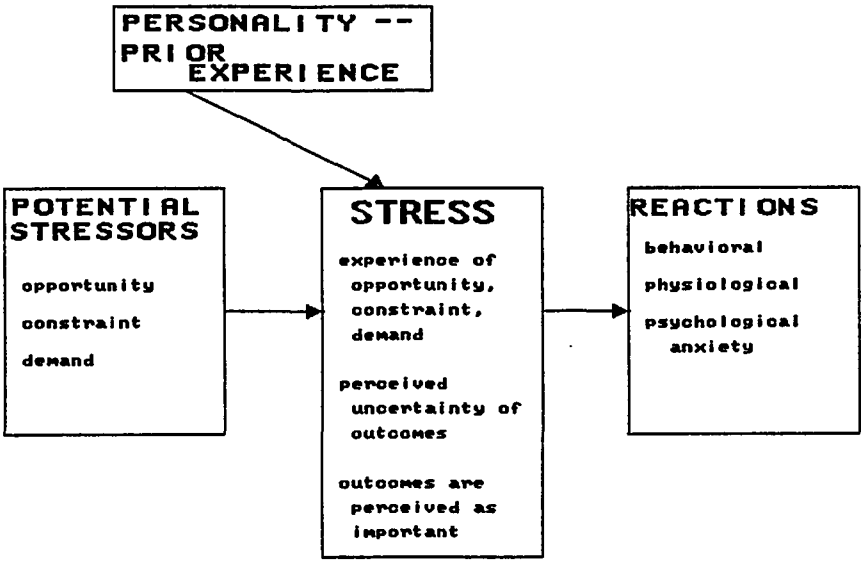

FIGURE 4
Theoretical Stress Model

The notion of stress as a perception has been noted previously. McGrath (1976) defined stress as necessitating a set of preconditions:

1- the employee perceives a stressor;

2- the stressor is perceived to be out of balance with one's ability;

3- failure to resolve this stressor is perceived to lead to differential rewards or sanctions.

McGrath (1976) describes stress in the framework of a negative/noxious environmental stressor. In this way, he fails to recognize that

stress can be positive, and thereby, falls short of a complete view of the construct.

Shirom (1982) like many other authors, reveals the same omission as McGrath (1976) by defining stress only in noxious terms. These are but a sample of how stress has been incompletely defined in the past. It appears that even when care is taken to carefully define stress as distinct from environmental antecedents, the theoretical literature errs in treating stress only as negative.

Based on this brief sample of organizational stress literature, it appears that Schuler's (1980) definition of stress is the most comprehensive and therefore, will be adopted here and expanded upon. Schuler did not discuss or delineate the difference between stress and anxiety. Most researchers agree that stress is a perceptual-cognitive variable. It is offered here that the emotional partner to stress is anxiety. This conclusion is based on literature which describes anxiety as "a feeling", "nervousness", etc.

Therefore, stress is defined as an individual's perceptual-cognitive appraisal of the results of a personally significant situation, created by a stressor, as ambiguous (i.e. having uncertain outcomes). (The definition of stressor is analogous to the definition of reinforcer in behavioral psychology. A reinforcer is defined based on its consequence of increasing behavior. A stressor is defined based upon whether or not it causes stress.) This perception is coupled with an emotional reaction (or consequence) to that stressor-i.e. anxiety. Moreover, the definition implicitly includes both "positive" and "negative" stressors. A positive

stressor is perceived as rewarding whereas a negative stressor is perceived as noxious. Perceptual/cognitive appraisal is clearly an important component of the definition which the proposed research will examine in greater detail. It is proposed that individuals differ in their dispositional likelihood to perceive stress and hence to experience stress. This concept and the aforementioned definition of stress will be tested in an applied setting.

This definition of stress was chosen for use in the present research because it appears to be the most complete definition offered in the organizational literature. This is not to say that one could not find a situation in which stress is not related to ambiguity. This definition is not necessarily exclusive — there may be exceptions to this definition.

In this chapter, the drawbacks and problems incurred in defining organizational stress have been described. A new conceptualization of organizational stress has been offered here in order to clarify past inconsistencies and confusion.

Drawing from the consistencies which do exist in the literature, it can be concluded that viewing stress as a process is conceptually appealing. It must be made clear that "stress" is not equal to "stressor" or "consequences of stress". The definition elaborated here will be adopted and tested. A new measure of a predisposition to perceive stress will be investigated.

The next step in accomplishing this goal is to identify the antecedents, consequences and personality factors that relate to stress. When

reviewing the literature on antecedents, consequences and moderators of the stress process it is important to keep in mind that stress has been measured inconsistently as if it were an antecedent or consequence in these studies. Therefore, there is little confidence in the interpretation of these results.

CHAPTER 3

Antecedent Factors / Stressors

It must be kept in mind, in the following review of the literature in this chapter, that each author's measure of stress is at variance with other authors and all are incongruent with the conceptual definition elaborated upon in Chapter 2.

One of the major areas of interest in the study of stress is its source. Many different antecedent factors have been studied. Since the present study is focused on organizational stress, we will examine antecedents that influence organizational stress only [however varied are its definitions].

Quick & Quick (1984) have conceptualized the different sources of organizational stress as falling into four categories:

1- **Task demands**- these are inherent in performing the job tasks, e.g. excessively routine jobs, lack of job security, work overload, etc.

2- **Role demands**- these are inherent in the role of the worker in the work environment, e.g. role conflict and role ambiguity.

(These two concepts have been so extensively examined as they relate to stress that they are often (incorrectly) considered synonymous with stress).

3- **Physical demands**- these are demands in the physical environment such as, extremes of temperature, noise, etc.

4- **Interpersonal demands**- these are for example, abrasive personalities, group pressure, etc.

Role Demands

The stressors most often linked to job stress are role ambiguity and role conflict. According to Jackson & Schuler (1985) "almost two hundred studies have been done using measures of role ambiguity and role conflict" (p.17). Quick & Quick (1984) define role conflict as

> "occur[ing] for an individual when a person in his work environment communicates a certain expectation about how he should behave and this expectation makes it difficult or impossible to fulfill another behavioral expectation or set of expectations. Therefore, stress is caused by the inability or difficulty in meeting the various expectations of his behavior" (p.29). "Role ambiguity results whenever there is inadequate information about what role behavior is expected, unclear or confusing information about expected role behaviors, unclear or confusing information about what behaviors will enable the incumbent to fulfill the role expectations, or uncertainty about the consequences of certain role behaviors" (ibid, p. 30).

The notion that individuals may systematically vary in the extent to which they perceive these aforementioned role issues has not been investigated.

The concepts of role ambiguity and role conflict have become so pertinent to the study of organizational life that they are often investigated

independently of stress and are more often than not considered to be stress. Jackson and Schuler (1985) conducted a meta analysis of the research on these constructs and formed the following conclusions regarding the relationship between role issues and job characteristics:

1- There is no simple relationship between the role variables and skill or task variety.

2- Autonomy is negatively associated with role ambiguity and is not associated with role conflict.

3- Feedback is negatively associated with ambiguity as is conflict. This makes intuitive sense--i.e. the more feedback the less ambiguity in the situation.

4- Task identity is also negatively associated with role ambiguity and conflict.

Taken together, the above four conclusions would appear to be in agreement with Hackman and Oldham's (1976) original notion of a job's "motivating potential". That is, conflict and ambiguity are negative role issues antecedent to stress and therefore, unlikely to be positively motivating (i.e. leading to effective job performance).

Several individual difference variables have been linked to role issues:

1- Locus of control (External) is positively linked to these role issues. However, as Jackson & Schuler suggest there is little theoretical justification to hypothesize a relationship between these concepts.

Nonetheless, this apparent lack of theoretical justification has not hindered research, and as such is a reflection of the general quality of stress research.

2- Self-esteem Self-esteem, like locus of control, is empirically linked to role issues (weakly) yet, again these findings have not been supported theoretically.

Many other personality variables have been associated with role issues: e.g. need for achievement (Miles, 1976), intelligence (Bagizzi, 1978), and type A behavior (Caplan & Jones, 1975). However, few conclusions can be drawn due to inadequate, little research, and/or conflicting results.

There are several affective and behavioral reactions associated with role issues (Quick & Quick, 1983):

1- Job satisfaction is generally negatively associated with both role ambiguity and conflict. It is not surprising (and it is in agreement with the person-environment fit model) that the more ambiguous and/or conflicting a particular behavioral expectation is, the less satisfied one feels with one's job (Quick & Quick, 1983).

2- Commitment and Involvement, like satisfaction, are negatively correlated with ambiguity and conflict. Again, these relationships appear to make intuitive sense (Quick & Quick, 1983).

3- Turnover is positively correlated with both role strains (Quick & Quick, 1983).

4- Absence is only weakly correlated with role ambiguity and conflict. Jackson & Schuler (1985) suggest "it is too soon to draw conclusions" (p. 42). (Quick & Quick, 1983).

5- Performance's correlation with role ambiguity and conflict is weakly negative. As with absence, only tentative conclusions can be drawn (Quick & Quick, 1983).

In conclusion, research in the area of role stains can be summarized as follows:

1- Much of the research is not guided by explicit, generally agreed upon theory;

2- Firm conclusions are difficult to draw because for many of the variables there are wide variations in the studies' findings.

3- Conclusions are based upon various measures of all of these constructs some of which have questionable psychometric properties (Quick & Quick, 1985).

4- The basic (incorrect) implicit [and sometimes explicit] assumption in this literature is that role issues are stress.

This research seems to merely correlate antecedents [referred to inappropriately or confusingly as "strains"] with outcomes, "skipping" any direct

assessment of stress [or by assuming the antecedents are the stress]. Perhaps this is why the relationships are weak. Therefore, all of the literature described here should be interpreted with caution.

The above conclusions, we will see, hold true for much of the research in the area of organizational stress.

Task Demands

Job Characteristics and Stress

On a global level, the National Institute for Occupational Safety and Health (NIOSH) has studied occupational categories of jobs and classified them as more or less stressful based on the incidence of stress-related illness. Jobs on the high stress list include: office managers, administrators, first-line supervisors and secretaries. Jobs on the low stress list include: personnel employees, craftsmen, and university professors. French, Caplan and Harrison (1982) also found differences in the type of stress experienced in job categories. According to their findings, administrators are subject to stress due to the quantity of work whereas scientists and engineers face challenging and demanding tasks which lead to stress. These findings should be interpreted with some degree of caution. Specifically, an individual with a high tolerance for a stressful job may fit quite nicely into a high stress occupation and might indeed be "stressed" by a low stress

occupation which has fewer demands. This notion of individual differences in reactions to stress and stressful situations is intuitively appealing but has yet to be sufficiently researched or assessed.

Some of the characteristics correlated with job stress are lack of decision latitude (Karasek, 1979), routine jobs (Walker & Guest, 1952), lack of autonomy, feedback, significance and friendship opportunities (Abush & Burkhead, 1984), critical job events (Eden, 1982), and complexity, interdependence, and closeness of supervision (Parasuramon & Alutio, 1981), to name a few. In all these studies job stress was measured as if it were a consequence or antecedent.

Karasek (1979) found that jobs demanding in time requirements are less likely to be interpreted as stressful if the incumbent has decision-making freedom. The author is actually measuring a consequence of stress NOT stress itself. Abush & Burkhead (1984) found "significant relationships between job tension and the following variables...autonomy, feedback, significance and friendship opportunities" (p.36). These variables were measured using the Job Characteristics Inventory (Sims, et.al., 1976). They found that when these variables were combined with a measure of type A personality they accounted for 21% of the variance in job tension, and that type A accounted for 8% of that variance alone. Therefore, one must not discount the role of individual differences in reactions to stress. The sample was 161 female workers employed by a social service agency in Florida.

Eden (1982) defines a critical job event (CJE) as "a time-bounded peak of performance demand made on the individual as an integral part of his job" (p.312). He found CJE to be related to various physiological measures of stress. Eden is actually measuring a consequence os stress NOT stress itself. His sample was 43 nursing students, all women.

All of these studies define stress [incorrectly] as either a consequence or antecedent. Therefore, we do not have confidence in the conclusions made.

Physical Demands

Let us now consider physical stressors in the workplace. Selye (1976) gave a great deal of attention to physical stressors. He believed that all of the following contribute to stress: temperature variations, ultraviolet rays, airblasts, etc. Other environmental concerns are cleanliness, odor, space, lighting, noise, privacy, etc. (Genderson, 1978). Noise is one environmental condition long investigated and linked to stress (Ivancevich & Matteson, 1980; Selye, 1976). (It is beyond the scope of this paper to discuss the noise literature in detail.) It should be noted that in this literature stressors are considered and treated as if they were "stress" itself.

Interpersonal Demands

Selye (1974) indicated that learning to live with other people is one of the most stressful aspects of life. Evans (1969) indicated that both too much or too little social density contribute to stress (as an outcome variable). Levenson (1978) points to dealing with an abrasive personality as an interpersonal stressor. Lewin, Lippitt and White (1939) indicate that interpersonal leadership style contributes to job tension for subordinates. These studies use consequences of stress as if they were equal to stress.

> "Greater understanding of the effects of stress is achieved when researchers not only recognize the separate effects of positive versus negative stress, but also consider the employee in a holistic perspective by taking into account the combined effects of job stress and personal life stress on employee well-being" (Bhagat, McQuaid, Lindholm and Segovisi, 1985, p.202).

The authors first distinguish between positive stress, in which an individual is confronted with an opportunity for doing what is desired, and negative stress, in which an individual is confronted with an excessive and undesirable constraint or demand. They found that "total negative life stress has a more important effect on organization outcomes than either job stress or personal life stress alone" (p. 202). (That is, the combination of either positive or negative job and life stress had more effect on organizational outcomes than either alone.) The organizational outcomes studied were satisfaction with work, commitment, job

strains, alienation, turnover intentions and absenteeism. This study is important because the authors take a more holistic view of the employee than ever before considered. Further, their results indicate that life events should be considered as influential in causing job stress. Their measures of negative life stress were three measures of distress and negative affect. These authors claim that they are measuring stress. However, their conceptualization, as described, relates to consequences to stress and not stress itself.

Maslach & Jackson found that married employees or those with children were less likely to experience job burnout (related to stress). Therefore, here again we see that non-organizational factors affect job stress. Similar results were evidenced by Gore and Mangione (1983). In this study, stress is treated as if it were an outcome / result of a situation. The authors are really measuring the consequences of stress.

Life Events

Individuals studying life events generally support the notion that "adverse life experiences cause psychological distress" (Monroe & Peterman, 1988, p. 31) Here stress is again treated as a consequence. "Virtually any adverse adaptive outcome has been hypothetically linked to life stress" (ibid, p.33). Interest in life events has been affected by Holmes and Rahe's (1967) Life Events Scale also called Schedule of Recent Events (SRE). However, there are several methodological problems associated with this scale in particular and other similar

scales. (These drawbacks are discussed in chapter 5.) There is no doubt that negative and positive life events affect organizational stress and should be included when studying this topic.

In conclusion, we can see that various aspects of organizational stress have been studied. However, much of the research suffers from some methodological (or conceptual) flaws such as inconsistencies regarding the measurement of stress. Some attempts at a comprehensive view have been made (e.g. Baghat, et.al., 1985). However, additional research employing a unifying and consistent definition of stress is badly needed. The notion of stress as a perception embedded in a process of antecedent - stress - consequence is a fruitful area for further investigation.

CHAPTER 4

Consequences of Stress

Again, when examining the literature reviewed in this chapter, one must keep in mind that the authors use varying definitions of stress.

> "On the national level, the cost associated with stress has been estimated to be approximately $75 to $95 billion annually. The U.S. Public Health Service highlighted the extent of this health problem for organizations when it estimated that the approximately 390,000 new cases of occupational diseases appear annually. In addition, as many as 100,000 deaths occur annually as a direct or indirect result of occupational disease" [such as stress, but defined as analogous to stressors] (Hendrix, Ovalle & Troxler, 1985, p. 188).

It is commonly agreed upon that organizational stress results in physiological, behavioral and psychological consequences (Ivancevich & Matteson, 1980; Schuler, 1980).

Physiological Reactions to Stress

One cannot study stress without accepting that it results in physiological reactions. For example, suppose one is being followed in a dark alley late at night. Part of the reaction to this stressful situation will be

physiological-- i.e. the normal fight-or-flight response to an emergency or stressor. Physiologically, the sympathetic nervous system is activated by the release of adrenaline and noradrenaline into the blood stream. This action has an effect on the reticular formation in the brain causing an awake, alert state. This state is, of course, a survival response. The eye pupil size increases, palpitations occur, the bronchi are relaxed causing hyperventilation, there is decreased blood flow and digestive activity in the stomach causing queasiness, glucose is released into the bloodstream causing a hypoglycemic reaction, sweating is increased, blood vessels are constricted causing high blood pressure and hypertension. Any of these reactions over a sustained period of time serve to debilitate the body and can result in long term damage (Quick & Quick, 1984). Specifically, Holmes and Rahe (1967) found that overly negative or positive events are related to illness in individuals. Several studies have found that stress (measured as analogous to stressors) is positively related to cholesterol level (e.g. Freedman, Rosseman & Carrol, 1957). Russek and Zohman (1958) found that prolonged stress (measured as analogous to stressors) can precipitate a heart attack in a coronary prone individual and can worsen rheumatoid or osteoarthritis. Wolff and Wolff (1943) discovered that prolonged conflict can increase harmful gastric secretions linked to ulcers. Selye (1976) linked stress (measured as analogous to stressors) to ulcerative colitis, a condition in which part of the large intestine bleeds. Headaches are linked to stress (Quick & Quick, 1984). The above is a sample of the plethora of physical symptoms thought to be caused by stress. However, these researchers are actually measuring reactions to stress NOT stress itself.

Behavioral Consequences of Stress

The societal cost of stress has been discussed previously. Let us now examine organizational costs in terms of negative employee behaviors. The behavioral consequences of stress can be divided into two areas: work and non-work consequences.

Non-work behavioral consequences of stress

1- Cigarette smoking- Several researchers have found a link between stress and smoking (e.g. Conway, et. al., 1981; Lindenthal, et. al., 1972; Hiller, 1981; Russek, 1965). It appears that, among smokers, the more one perceives a situation as stressful, the more likely he/she is to smoke. When one considers that both stress and smoking are linked to heart attacks and strokes, the impact of the two in combination should not be ignored. It should be noted that in a "vicious cycle" these consequences in turn (eventually) may constitute stressors themselves.

2- Alcohol abuse- Like smoking, alcohol consumption has been found to be positively related to stress (Cosper, 1979). Several researchers have suggested that type of occupation may be the most influential factor determining alcohol problems (e.g. Plant, 1979). It has been suggested that the same type of individual who seeks a stressful occupation is also likely to be alcohol prone (Quick & Quick, 1984).

3- Accidents- Herschfeld and Behan (1963; 1966) found stress to be a significant contributor to industrial accidents. Waarshar (1979) wrote "A person under stress is an accident about to happen" (p. 193).

Work consequences

There has been a superabundance of research on the work consequences of stress. Since the current research is focused on job stress, we will examine these consequences in some depth.

Bhagat et.al. (1985) found that negative job stress (conceived of as analogous to stressors) has a detrimental effect on job satisfaction and commitment and is likely to heighten feelings of alienation. They are among the few researchers who have separated the effects of positive and negative stress.

The study of the relationship between stress and performance on the job can be traced as far back as 1908, to the Yerkes-Dodson model. This model suggests that performance will be low if stress is either too low or too high. This was one of the first conceptualizations to portray job stress as an activator. In other words, a moderate amount of any kind of stress seems to move an individual to action. This notion has received considerable support in the organizational literature (Ivancevich & Matteson, 1989; McLean, 1979; Meglino, 1977; Moss, 1981). They also suggest that this relationship may be person-specific i.e. a different level of arousal is optimal for different people.

An alternate model of the job stress-performance hypothesis is that the two variables are positively correlated. At low levels of stress, the individual does not face a challenge and therefore, performance is likely to be low. At moderate levels of stress, the individual is moderately aroused and therefore, will exhibit moderate performance levels. At high levels of stress, the individual is highly aroused and performance will vary accordingly. There has been less support for this model that than the Yerkes-Dodson model (Jamal, 1984).

Stress has been consistently linked to various forms of organizational participation such as absenteeism, lateness and turnover. Van Sell et.al. (1978) indicated that the higher the stress, (in this case- role issues) the higher absenteeism and turnover. Marvis and Macy (1982) suggest a positive relationship between stress and the consequential absence and tardiness.

In general, we can conclude that stress has mostly negative effects on job behaviors. Performance, the most widely investigated behavior, does not appear to have a simple or clear cut relationship with stress. Furthermore, research into the mediating effect of individual differences would prove inciteful.

Psychological Consequences of Stress

Freud (1959) used the term anxiety to describe the cause of many of his patients' psychological problems. His notion of anxiety is analogous to the current concept of stress. Pykel (1976) indicates that stressful events such as job

promotion or termination have been positively associated with varying degrees of depression and have lead to suicide. Marital discord has been positively associated with job stress. This suggests a "spillover" effect of job stress. That is, job stress affects or spills over to the familial life thereby causing additional stress. At least one researcher (Handy, 1978) however, suggests that the impact of organizational stress on the familial relationship(s) may vary as a function of the type of relationship. That is, supportive relationships may be more immune to the spillover effects of job stress, or as this author suggests, some individuals may be more or less resistant to spillover.

Sleep disturbances or insomnia may be positively associated with stress (Quick & Quick, 1984). "Occupational stress can lead to chronic and sometimes debilitating sleep disturbances" (ibid, p.54).

Burnout can be characterized as a psychological reaction to stress in the form of exhaustion. Burnout is associated with a decline in work performance, physical exhaustion, headaches, gastrointestinal problems, weight loss, insomnia, mood swings, irritability, suspiciousness and a sense of helplessness (Moss, 1981). Moss (1981) also indicates that burnout may occur more often in individuals with a strong work commitment and high expectations.

It is clear from the previous discussion that stress can result in physiological, behavioral and psychological consequences. It is also clear that these effects are debilitating. Research has not yielded firm conclusions regarding

the relationship between stress and its consequences. This is mainly due to the inconsistency in the measurement of stress.

CHAPTER 5

Individual Differences in the Reaction to Stressful Conditions

Again, the literature reviewed in this chapter should be interpreted with the understanding that the authors measure stress inconsistently.

The notion of individual differences in reaction to stress can be traced as far back as the Yerkes-Dodson model which suggests that an optimal level of arousal exists for individuals in which particular levels of stress are facilitating.

Type A Personality

Perhaps the most widely studied individual difference variable in the stress literature is Type A behavior pattern. It should be noted however, that Type A is more often a topic in physiological psychology rather than organizational psychology. Type A pattern may be described as "Competitiveness, a constant struggle against time, an achievement-orientation, and an intense sense of urgency" (Ivancevich, Matteson & Preston, 1982, p. 376). Laboratory studies have resulted in support of a positive link between Type A behavior pattern and a self-report measure of (perceived) stress (Dembroski, MacDougall, Herd &

Shields, 1983). Logically one can intuit that a competitive, achievement-oriented, sometimes hostile individual will be more susceptible to stressful conditions than a more relaxed individual. Rhodewalt, Hays, Chmers & Wysocki (1984) indeed found that sources of work stress interacted with Type A behavior pattern in predicting psychological and physical health. They also found that

> "those events that were perceived as undesirable and only moderately controllable were related to psychological and physical distress in type As...[this] suggests that it is the type As' perception and, perhaps, manner of responding to certain events rather than their simply experiencing those events that contributes to the increased cardiovascular wear and tear" (ibid, p. 156).

These perceptual mediators of stress have not been studied. The authors call for the precise measurement of mediating psychological mechanisms of stress.

Ivancevich, Matteson & Preston (1982) also found that "Type A characteristics were more adversely affected [than non Type A] by quantitative work load" [their measure of 'stress'] (p.382). They write

> "Attempts to identify employees with a Type A predisposition would appear to be a fruitful area for additional and more rigorous...research. Certainly, more validation work in measuring this pattern of behavior is warranted" (ibid, p. 388).

Abush & Burkhead (1984) found that Type A personality significantly contributed to job tension. "Of all of the predictor variables under

investigation in this study, Type A contributed the most singularly to job tension" (ibid, p.40).

So far, we have seen that a personality syndrome, Type A, may predispose an individual to stress sensitivity. We have also discovered that additional research is needed in this area to (1) further substantiate the relevance of this complex personality construct to the concept of stress, (2) more adequately measure this complex construct and (3) examine the effect of "cognitive perception".

Hardiness

In 1979, Kobasa first introduced the concept of "hardiness"—characterized by a sense of control over external events, a feeling of involvement, commitment and purpose, and adaptability to changes in the environment. She discovered that individuals possessing this hardiness factor were less likely to be ill, even if they were in highly stressful situations. In a related study, Kobasa, Maddi & Kahn (1982) suggest that hardiness can be grouped with other "resistance resources" such as social support. They suggest that "personality dispositions can also influence coping processes and that this may be the mechanism whereby personality exercises a buffering effect on stressful events" (ibid, p. 169). They found that hardiness "has its greatest health-preserving effect when stressful life events mount" (p. 175).

In a related study, Howard, Cunningham & Rechnitzer (1986) found that hardiness buffered the relationships between Type A behavior pattern and illness reactions to stressful conditions. These findings would seem to indicate that hardiness might counteract the deleterious effects of Type A. However, this is but one study and additional research is needed in order to form firm conclusions.

Social Support

Several studies have focused on the moderating effects of social support on the stressor-reaction relationship. In general, the results indicate a negative relationship between support and stress. Fisher (1985) conducted a longitudinal study to assess the effects of social support on stress and found social support to have "important main effects in reducing the level of unmet expectations, stress and facilitating positive adjustment outcomes" (p. 39).

Negative Affectivity

In 1984, Watson and Clark used the term "negative affectivity" to define a generalized mood dimension related to negativity. They wrote that

> "A number of apparently diverse personality scales-- variously called trait anxiety, neuroticism, ego strength, general maladjustment, repression-sensitization and social desirability...are shown to be in fact measures of the same stable pervasive trait [negative affectivity]" (p.465).

They indicate that although individuals possessing this trait "react more strongly to stressful situations, in the absence of stress....they tend to be no more anxious than those low in negative affectivity" (p. 466).

They further indicate that individuals high in negative affectivity are more likely to experience distress than individuals low in the construct.

Watson & Clark (1984, 1988) do not discuss when Negative or Positive Affectivity (NA/PA) emerges in an individual. It is not clear whether or not this is a variable learned at an early age or later in adulthood. This is worthy of some investigation. If NA/PA are similar to other dispositional attributes, then perhaps they are learned at an early age.

Watson (1988) developed a 25-item true-false self-report measure of Negative and Positive Affectivity. This measure yields two separate independent measures: Negative affectivity (NA) and Positive affectivity (PA). No data is available regarding this measure. Watson developed this measure based on his knowledge of the constructs. Theoretically, one could use any personality or affectivity measure to tap these constructs (e.g. neuroticism). Watson's scale was chosen in the current research because it was developed specifically to measure NA and PA.

Brief, Burke, George, Robinson & Webster (1988) examined the relationship between negative affectivity and measures of stress and strain (measured as if it were a consequence). They conclude

> "that our stress and strain measures all were correlated significantly with negative affectivity. These correlations are consistent with the suggestions

> by others that negative affectivity may not just be a psychometric nuisance in job stress research but, rather, a theoretical variable with which to be reckoned" (p. 197).

It should be noted that all measures in this study were self-report, obtained at the same time. The authors do not comment on common method variance and how this might have affected their findings.

Few researchers have given attention to the role of perception in stressful reactions. Dispositional variables may indeed affect the antecedent-stress-reaction relationship. This effect may be unconscious. The difference between disposition and perception is exemplified in the study of anxiety.

Anxiety

Spielberger (1966) identified two types of anxiety:

> "Anxiety is perhaps most commonly used in an empirical sense to denote a complex reaction or (emotional) response-- a transitory state or condition of the organism that varies in intensity and fluctuates over time. But the term anxiety is also used to refer to a personality trait-- to individual differences in the extent to which people are characterized by anxiety states and by prominent defenses against such states" (p. 12).

Thus Spielberger (1966) differentiated two different types of anxiety: state anxiety (A-state) and trait anxiety (A-trait) respectively.

He later wrote:

"An anxiety state is at the core of the anxiety process, which may also involve (a) cognitive appraisal of a stressful situation as personally threatening, (b) psychological defenses that are activated in an effort to reduce or alleviate intense and unpleasant anxiety states, and (c) behaviors that are motivated by intense levels of A-state" (ibid, p. 138).

From Spielberger's work we can conceptualize stress/ anxiety according to the model in chapter 1.

The component of cognitive appraisal or perception may affect the severity of a stress reaction. This is an area worthy of study. This author could find only one study that investigated the effect(s) of perception on anxiety reaction(s). We have much to learn regarding stress from the literature on anxiety. It is time these two areas were integrated.

Phillips and Endler (1982) suggest

"Data on subjects' perceptions of situations will provide valuable information regarding the degree to which cognitive appraisals mediate between situations and behavior" (p. 305).

They found that cognitive appraisal of a situation as anxiety-provoking did affect anxiety. The authors recommend additional research. Their measure of state anxiety was a one-item self-report measure of reaction to the situation. Research in this area would benefit from investigation of the effects of perception and/or personality on many aspects of stress such as behavior and physiology. It would be interesting to know if perception influences coping. Additionally, another

research question might be the relative contribution of personality on the perception of stress reactions.

In this chapter, we have seen that personality variables such as Type A behavior and A-trait affect stress reactions. We have also discussed preliminary research suggesting that perception also affects stress reactions.

Test Anxiety

(The following discussion of test anxiety is limited to the employment situation.)

The study of test anxiety began in 1952 at Yale University. Here Sarason and Mandler (1952) developed a Test Anxiety Questionnaire designed to categorize students into high- or low-test-anxious individuals. They later discovered that the low anxious group performed better on IQ test than the high-anxious group (Sarason, Mandler, and Craighill, 1952).

Since 1952, an enormous amount of literature has examined test anxiety. However, like stress, this is a difficult construct to define.

> "Test anxiety has proven difficult for behavioral scientists to define adequately. The difficulty of defining test anxiety arises, in part, because test anxiety has many facets, and no theory has yet been formulated that describes it adequately. A second major source of difficulty arises out of the nature of behavioral science, which is literally a science of behavior and not a science of mind. In contrast, anxiety is an emotion—a phenomenon both of behavior and of mind, and removing the behavioral

manifestations of anxiety does not necessarily remove the anxiety one has in one's mind" (Sieber, 1980, p.15).

Researchers agree that test anxiety is a special type of general anxiety which occurs around testing situations (Sarason, 1980). Sarason and Mandler (1952) suggest that test anxiety is manifested by "feelings of inadequacy, helplessness, heightened somatic reactions, anticipations of punishment or loss of status or esteem, and implicit attempts to leave the testing situation" (p. 166).

Based on the distinction between stress and general anxiety elaborated herein, one can conclude that test anxiety is the emotional reaction to a stressful testing situation. This definition is consistent with Mandler & Sarason's (1952) definition. Test anxiety is discussed in the current context because the behavioral operationalization of stressors in this study is an employment test. Therefore the anxiety reaction experienced by participants is a test anxiety reaction.

The following diagram should serve to clarify:

STRESSOR ----------> STRESS ----------> TEST ANXIETY		
Employment test	perceive results as ambiguous and results are important	feel anxious

In 1988, Hembree conducted a meta analysis of the results of 562 test anxiety studies. The following three conclusions are made:

1- "Test anxiety and performance are significantly [negatively] related...Conditions that seem to enhance the performance of high test anxious students include low stress instructions, provisions for memory support, minimal distraction and background music" p. 73.

2- "Test anxiety can be effectively reduced by a variety of behavioral and cognitive-behavioral treatments delivered in a broad assortment of conditions" p.73.

3- "Improved test performance and Grade Point Average (GPA) consistently accompany test anxiety reduction" p.73.

It is clear from this meta analysis that test anxiety is a concept to be reckoned with in testing situations. In the current study, with its focus on stress rather than on anxiety, consideration of test anxiety is less important. Nevertheless, it is important to keep the distinction between these two concepts in mind. Stress is a perceptual predisposition whereas test anxiety is an emotional reaction by someone predisposed to experience tests as particularly stressful.

Propensity to Perceive Stress

As previously discussed, many authors conceive of stress as a perceptual variable. However, stress has never been both defined and directly

measured as a perceptual variable. Many authors will define stress physiologically, for example, and then measure it via self-report reactions to stressors. Further, no organizational researcher has investigated whether individuals vary in how stress is perceived.

If it is agreed that conceiving of organizational stress as a stable dispositional perceptual variable is useful, then it is important to measure this perception and to examine individual differences in this perception. An individual may perceive a potential stressor, but if that stressor is not relevant/important, and it is not involved in an uncertain outcome, then it may never be perceived as stressful and therefore will not lead to stress. Alternately, some individuals may be predisposed to perceive stressors which lead to stress, more often than others. If so, then are these individuals more prone to physical, psychological and/or behavioral ailments? Are they more resistant to stress reduction strategies? Perhaps we need to work on changing perceptions rather than relaxation. The investigation of individual differences in the propensity to perceive stress is important in advancing our progress in stress research and in helping individuals overcome the adverse effects of stress.

In the current study, subjects will be asked to rate their stress level reaction to a series of 30 ambiguous situations.

CHAPTER 6

Measures of Stress

As may be seen from the discussion in previous chapters, many researchers have studied stress. These authors have used a wide variety of measurement devices to assess stress. While many of these devices are ad hoc, based on the author's need, several standard measures are used often. This chapter will explore these measurement devices.

The various measures of stress can be grouped into psychological, behavioral, physiological instruments and measures purporting to assess dispositional attributes.

Ad Hoc Measures

Since so many established measures of stress exist, most researchers choose to employ an established measure when studying stress. Often it is difficult to determine from the published research reports if the measure used is established due to scanty descriptions of scales. Some physiological measures might be interpreted as ad hoc e.g. serum cholesterol (Ivancevich & Matteson, 1982). Of the twelve studies described on pages 16-21 none employed an ad hoc measure. All selected a measure that had been used previously although not well-known. It should be noted that while most researchers opt for "established"

measures, the instruments chosen often do not tap stress. Rather, they tap role ambiguity, etc. (See pages 16-21 for a more detailed description).

Psychological Measures

All of the psychological measures of stress define stress as either a psychological stressor or as a physiological reaction to a stressor. No measure, however, implies that stress is a stable perceptual predisposition.

The Stress Diagnostic Survey (SDS)

This provides a very comprehensive measure of stress. Developed by Ivancevich and Matteson in 1980, the Stress Diagnostic Survey is designed to help employees identify areas of organizational stress. The authors also developed a non-work version to identify personal stressors. The work version contains 80 statements to which the respondent indicates the frequency of occurrence (never, sometimes or always). (For example: My job duties and work objectives are unclear to me.) Respondents are asked merely if these conditions exist with the assumption that they are stressful. No attempt is made to determine if they are indeed stressful to the individual. Responses are totaled to yield scores for 15 stressor categories. These are then plotted to yield a profile which can be used to easily see the areas in a person's life that are causing stress.

This measure yields 15 "categories" of "stress"-- i.e. stress dimensions such as role ambiguity and conflict. Ivancevich & Matteson (1980) indicated that the 15 categories of "stress" were determined by a factor analysis with data from

2000 executives, nursing personnel, students and medical technicians. Coefficient alphas for the 15 categories range from .58 to .87. Additional validity evidence is not offered. The non-work version of the SDS is "not as well developed psychometrically" (Quick & Quick, 1984, p.115). That is, while it may aid in pinpointing the source of stress (e.g. marital stress), it does little to pinpoint the cause. This is probably due to the global nature of the statements.

Ivancevich & Matteson (1980) point out that "while there are no norms for this [work version] form, the ideal situation would be for all fifteen of the categories to be in the low stress region" (p. 119). Quick & Quick (1984) add that the SDS is most well suited to managerial employees in large organizations.

While the SDS appears to be an adequate measure of stress, the authors are really assessing the number of stressors which exist in a particular situation. They need to go one step further and determine if these stressors are indeed being perceived as stress.

The Life Events Scale (LES)

The LES is used to study long-term effects of stress. This scale was first developed by Hawkins, et.al. in 1957.

Respondents are asked to check any event that has occurred in the past year. The measure taps personal, family, financial, social and work stress.

Quick & Quick (1984) point out

> "The LES may be a useful tool to assess the general level of stress among a group of individuals and to predict the likelihood of future illness. It

does not, however, provide specific diagnostic information to guide organizational or individual interventions" (p.123).

There are several drawbacks to using the LES.

1- "A number of life events include items that really signify stressful processes...or chronic role strains...rather than discrete event occurrences. Combination of these type of items with more discrete events renders interpretation of scores and obtained correlations problematic" (Cohen, 1988, p. 12).

2- Life events are hypothesized to be related to psychological functioning. However, such experiences symptomatic of maladjustment (e.g. neurotic or psychotic symptoms such as eating disorders). are excluded from this measure thereby making the relationship suspect. That is, experiences delineated by this measure are "normal" everyday life occurrences.

3- There is no differentiation between event occurrence and the individual's evaluation of that event. This would seem to indicate that either mere occurrence or evaluation of a stressor is being measured.

4- Desirable and undesirable events should be scored separately because differences exist in how these events relate to functioning.

If the above problems can be dealt with, the LES can provide excellent data regarding stress.

The Hassles and Uplifts Scale

This scale is similar to the LES in that it also is used to assess the general level of stress while providing little in the way of diagnostic information. This scale was developed in 1981 by Kanner et.al. Respondents are presented with 117 items that are identified as possible irritants and 136 items that are identified as sources of good feelings. Each item is rated on a three point severity or frequency scale, respectively. The test-retest reliabilities for this measure average around .65. In a ten month study, Kanner et.al. (1981) found the Hassles and Uplifts scale was a better predictor of psychological symptoms than the LES. The Hassles and Uplifts Scale is actually measuring stressors described as "irritants" rather than stress.

Physiological Measures

One of the major critisms of psychological measures of stress is that they are subjective. Therefore, many researchers believe that more objective measures should be used (Quick & Quick, 1983). Probably the most objective measures available are physiological assessments. There are literally dozens of physiological measures available to measures stress. The following is just a summary: pulse, blood pressure, body weight, respiratory rate, galvanic skin response, electroencephalogram, hormone levels, cholesterol level, blood flow, etc. All of these measures may be inconvenient to measure and some may be uncomfortable for the respondent. They also tend to be very expensive.

Therefore, many researchers avoid using physiological measures. Physiological measures of stress do not involve a perceptual evaluation at all. Rather, physiological measures of "stress" are really measures of covert behavioral consequences of stress.

Behavioral Measures

Behavioral measures of stress vary from one item scales to more complex measures. Some researchers will use archival or self-report measures of lateness and/or absence. Others use more complex self-report measures.

The Pennebaker Inventory of Limbic Languidness (PILL)

This measure taps the frequency of occurrence of a large number of common physical symptoms and sensations (e.g. asthma, chills, indigestion, etc.). Respondents are asked to rate 54 items on a 5-point Likert scale ranging from Have never or almost never experienced the symptom- to -More than once every week. Scores of 3 or above are averaged to form a score.

The internal consistency reliability of the PILL averages around .90. The test-retest reliability averages around .80. These statistics are averaged over samples ranging in size from 124 to 286 subjects. The composition of the samples is not offered (Pennebaker, 1982).

One of the advantages of the PILL is that it allows the researcher to see which specific symptoms are experienced. When linked to perceptual stress data, the PILL can be used to gain a more multi-faceted view of the stress

concept (Pennebaker, 1982). It should be noted that the PILL is actually a measure of consequences of stress rather than stress itself, which the author acknowledges in his recommendation to link this data with the perceptual assessment of stressors. The PILL will be used in the current research.

Measures Purporting To Assess Dispositional Attributes

Several dispositional attribute measures have been used as measures of stress (e.g. Type A, coping, workaholic, and locus of control.) The most widely measured variable is Type A.

Type A

There are several measures of Type A behavior pattern. However, the Jenkins Activity Survey (JAS) has been researched and used most frequently. Sample items include: Frequently hurries speaker to the point; Tends to get irritated easily. Research has indicated that the JAS is a strong predictor of coronary artery disease (Quick & Quick, 1983).

All of the aforementioned self-report psychological measures of stress purport to be direct measures of stress. However, based on the definition of stress expounded here, stress is a perceptual variable. Therefore, these often-used assessment tools are not measures of stress. Or are they? By definition a self-report measure taps a perception. Therefore, those measures which tap

stressors may be in part unintentionally obtaining a measure of stress. This is not clear. No measure taps the propensity or likelihood that a person will perceive stress in an ambiguous situation. A measure of stress will be developed that purports to tap the likelihood of perceiving stress in an ambiguous situation. Further, this is a perception since we are using a self-report format. Such a measure is important because the results have implications for physical illness and treatment of stress. Individuals who tend to see stress in most situations are likely to have more physiological, psychological and behavioral symptoms. This concept will be explored.

It is clear from the literature presented here that stress is an important topic about which we know very little. Lack of knowledge in this area is mainly due to inconsistencies in measurement. The first step in drawing conclusions about a topic is definition of that topic. If we are unsure or inconsistent in the definition of a concept, then how can we make conclusions regarding the relationship of this construct with other variables? We need consistency in the measurement of stress. The definition offered here is developed from the limited amount of literature which gives attention to the definition of this concept. Once a definition is agreed upon, only then can we begin to investigate the correlates of stress.

CHAPTER 7

METHOD

Problem Statement

A great deal of organizational research has been conducted in relation to stress. However, the majority of these studies are problematic. Stress can be conceptualized as being a process composed of antecedents - stress - consequences. Much, if not all, of the literature (especially the empirical research) in this area tends to confuse the notion of stress with its antecedents and/or consequent reactions. Most researchers have actually measured a stressor or a consequence of perceiving a stressor but have interpreted their findings as if they were measuring stress itself (see chapter 2).

After reviewing much of the organizational research, it is proposed here that stress is the perception of a personally relevant situation as ambiguous and furthermore that stress is a stable dispositional variable causally prior to its consequent reactions. It is proposed that in any given situation one individual may perceive stress while another does not.

A new measure of stress was developed to test this concept of stress as a perception. A path analysis was employed to test the notion that stress is causally prior to its consequent reactions (see chapter 2).

Subjects were asked to respond to a series of scenarios depicting what may be interpreted as stressful situations. Their responses to this measure

were correlated with measures considered to be related to stress as explicated in the literature review.

This correlation served to test the proposition that this new measure does indeed reflect stress and that stress is a process linked to antecedents and consequences.

A correlational design was employed. Factor analysis and path analysis were used.

Hypotheses

H1- The Propensity to Perceive Stress (ranging from high to low) is negatively correlated with life satisfaction. Individuals high in the propensity to perceive stress are less likely to be satisfied with their lives than individuals low in their propensity to perceive stress. This hypothesis is based on the literature which links stress with satisfaction (see chapter 3). Inasmuch as stress is considered a dispositional variable and satisfaction is often considered an attitude, it is therefore suggested that stress is causally prior to life satisfaction. Life satisfaction, it is often agreed, may vary depending on the situation.

H2- The Propensity to Perceive Stress is positively correlated with job alienation (or negatively correlated with involvement). Individuals high in the propensity to perceive stress are more likely to be alienated on their job than those low in their propensity to perceive stress (see chapter 2). Inasmuch as

Alienation is an attitude and the Propensity to Perceive Stress is a stable disposition, the Propensity to Perceive Stress is therefore hypothesized to be causally prior to Alienation.

H3- The Propensity to Perceive Stress is positively correlated with reported stress behavioral consequences as measured by the Pennebaker Inventory of Limbic Languidness (PILL). Individuals high in the propensity to perceive stress are more likely to report having experienced stress related behaviors measured by the PILL than those low in their propensity to perceive stress (see chapters 4 & 5).
Since behaviors occur after a disposition, the Propensity to Perceive Stress is hypothesized to be causally prior to the PILL.

H4- The Propensity to Perceive Stress is positively correlated with test anxiety behaviors observed in a potentially anxiety producing pre-employment test situation. These behaviors can be described as "typically nervous behaviors" such as chair swapping, cracking knuckles, stretching, complaining, etc. Individuals high in the propensity to perceive stress are more likely to exhibit "nervous type" behaviors in a potentially anxiety producing condition than those low in their propensity to perceive stress (see chapter 4). As described in Chapter 3, the Propensity to Perceive Stress is hypothesized to be causally prior to test anxiety.

H5- The Propensity to Perceive Stress is positively correlated with negative affectivity. Individuals high in the propensity to perceive stress are more likely to be high in negative affectivity than those low in their propensity to perceive stress. This is based on the consistent link between Negative Affectivity and stress in the literature. Some researchers go so far as to suggest that negative affectivity and stress are the same variable.
The causal priority of these two variables is in question and can be argued in many directions. Several alternate paths will be tested.

H6- The Propensity to Perceive Stress is negatively correlated with positive affectivity. Individuals high in the propensity to perceive stress are less likely to have a positive dispositional affect than those low in their propensity to perceive stress (see chapter 5).

H7- The Propensity to Perceive Stress is positively correlated with self-reported test anxiety. Individuals high in the Propensity to Perceive Stress are more likely to report feelings of test anxiety than those low in their Propensity to Perceive Stress. This hypothesis is based on the literature which links stress with anxiety. As described in Chapter 3, the Propensity to Perceive Stress is causally prior to test anxiety.

H8- The Propensity to Perceive Stress is positively correlated with anxiety errors in typing. These anxiety errors are an additional measure of test anxiety.

H9- A path analysis was used to test the causality of the models 1-4 below. It was predicted that Negative affectivity is causally prior to the Propensity to Perceive Stress and that The Propensity to Perceive Stress is causally prior to Life satisfaction, Alienation-Involvement, the Pennebaker Inventory of Limbic Languidness, observed anxiety behaviors, self-reported test anxiety and anxiety errors.

Several alternative path models were tested:

a- Alienation and the PILL as causally prior to Life Satisfaction. Since life satisfaction may be interpreted as the result of many life situations, it is hypothesized here that alienation and stress behaviors as measured by the PILL may be causally prior to life satisfaction. It should be noted that there is no direct empirical support for this hypothesis.

b- The paths from Positive and Negative affectivity to PPS was tested as bidirectional. This model serves to test the hypothesis that negative and positive affectivity and the propensity to perceive stress mutually affect each other.

c- The paths from negative and positive affectivity to the propensity to perceive stress was eliminated.

d- Paths directly from negative and positive affectivity to the outcome variables were also tested. Since little research exists regarding the

relationship between affectivity and the outcome variables, this alternate model was tested.

Both b and c above reflect alternate theories regarding the relationship between negative and positive affectivity and the Propensity to Perceive Stress. The causality of the relationship between these variables is tested by b above. The relevance of negative and positive affectivity is tested by c above.

These alternate paths constituted four different tested path models.

A pictorial representation of the first path model is presented below in figure 5:

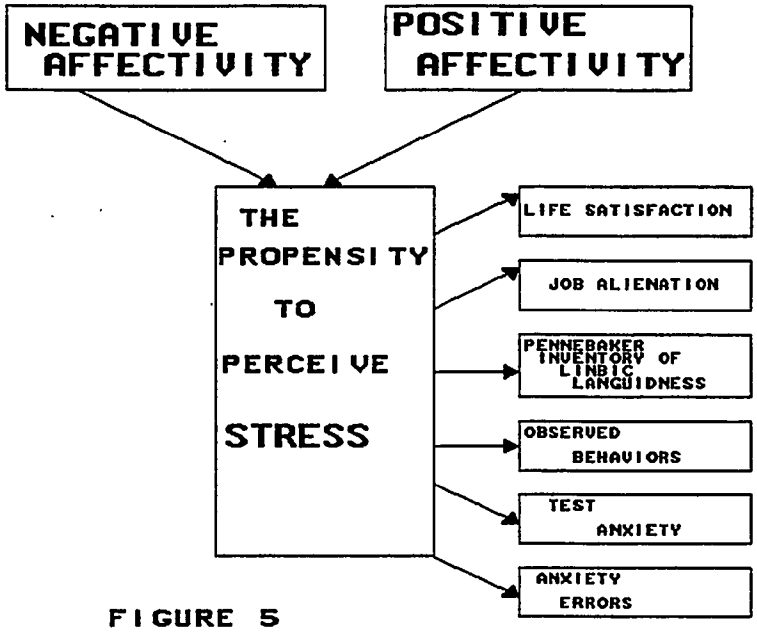

FIGURE 5

Proposed path model of the Propensity to Perceive Stress, its antecedents and consequences.

Procedures

Instrument Development

Prior to the administration of the surveys involved in this study, a measure of the Propensity to Perceive Stress had to be developed. This measure was developed in the following way:

1- Scenarios were developed of ambiguously stressful situations. This was accomplished by interviewing a convenience sample of 30 friends, co-workers and relatives regarding situations of stress in their lives. An attempt was made to include both work and non-work situations and positive and negative situations.

2- The results of these interviews yielded 30 short scenarios.

3- These scenarios were pilot tested on another convenience sample of 11 co-workers. Subjects were asked to rate their perceived stress level for each scenario on a scale of 1-5 (very low to very high). Item analyses were not performed due to the small sample size.

4- Four scenarios were replaced due to lack of variance in responses and because new scenarios which reflect daily hassles were needed. A hassle can be defined as an annoying concern. It is distinct from a major life event such as a family death, marriage, etc in that a hassle is more an annoyance than a life disruption. The stress

literature points to daily hassle stressors as well as major life event stressors.

(See Table 1 below)

TABLE 1

Comparison of four items in the first and second version of the Propensity to Perceive Stress scale.

OLD ITEM	old Range	NEW ITEM
At 35, you, your spouse and family are getting along well. You have moved to a new job and your boss really seems to like you. He is demanding that you work overtime on a regular basis and this eats into your weekends.	2 - 4	When you awoke, it seemed like a good morning. Then you discovered you left your brand new $200.00 pair of glasses on the train and you need them for an early morning meeting.
You have been in a love relationship for two years. You and your mate get along very well. You have decided to get married. You have saved for a year and the wedding is tomorrow afternoon. You are thinking about tomorrow hoping everything goes well.	2 - 4	You had bad dreams all night and awoke tired and crabby. Then when you got to work you realized you left your keys at home.
You have been working in the same job for 4 years. You are happy with this job. Unfortunately, due to budget cuts, you are laid off. You have a family to support and you are concerned about finding another job. Your spouse and two children love you and support whatever you do.	1 - 3	You had a pretty good day at work. However, it was a very rainy day and when you got home you discovered you left the windows open and your apartment was flooded.
You have been working for the same agency for 5 years. You enjoy your work very much. It allows you freedom and offers challenges. One of your clients claims you made a huge error in his calculations. He is threatening to sue your company.	1 - 3	You need new clothes badly. So today you went shopping. Unfortunately you discover that you gained weight and that you no longer fit into your usual size.

Finding a relevant sample

The author was working as an examiner for the City of New York, Department of Personnel. All New York City civil service employees must be

tested by the Department of Personnel prior to being hired by any city agency. Several job titles required that a typing test be included in the battery of tests given to potential clerical employees. It was consistently observed that candidates appeared to be under considerable anxiety when taking the typing test. Inasmuch as test anxiety was evident in this natural setting, this group of potential clerical employees were selected as subjects for this study. With the permission of the Department of Personnel, surveys were administered to every candidate taking a typing test from March 1990 to May 1990 (see below).

Pretesting the Situation

Job applicants in the testing situation were observed by the author (for several years prior to developing and administering the current survey) for "nervous behaviors". It was observed that candidates often asked to change their chair three or more times because it was uncomfortable; exhibited cold hands; asked the same question over and over; complained about the temperature of the room; asked for a typing stand; dropped things; had trouble turning the typewriter on; verbally indicated anxiety; etc. All these behaviors were considered anxiety-related (see appendix 4). Anxiety errors in typing were also recorded. That is, subjects, when under test anxiety, tend to make anxiety errors such large spacing errors by holding the return key too long. Both anxiety behaviors and errors were recorded.

The Pre-Employment Testing Situation

- Subjects arrived to take the typing test and were told to sit anywhere they like in a classroom of 24 seats. The examiner then read instructions regarding the filling out of forms with their social security number and name. All subjects were then fingerprinted for positive identification. (All candidates taking a New York City civil service employment test are fingerprinted and investigated). Subjects were told to make themselves comfortable. Once they were ready to begin they were given a five (5) minute practice test which was much like the actual test. After completion of the practice test, subjects were given the actual test.
- All nervous/anxiety behaviors were observed and recorded throughout the testing period. The examiner observed candidates by circulating about the room. There were approximately 10-15 candidates per session and 4 sessions daily.
- Once testing was complete, all subjects were given a questionnaire to complete regarding their experience of anxiety/nervousness before and during their test situation (see appendix 2). Thus all test anxiety measures were taken at the test site at a time which was close to the anxiety provoking situation.
- Subjects were then asked to take, complete and return, via business reply mail, an at-home questionnaire two days after the test. It was important

that subjects have time to relax and not be influenced by test anxiety when completing this second questionnaire. It was felt that two days after the test was sufficient time for the subject to recover from the test anxiety. This second questionnaire contained measures of life satisfaction, alienation-involvement, the propensity to perceive stress, negative affectivity, positive affectivity, the Pennebaker Inventory of Limbic Languidness and demographic questions. (see appendix 3).

Subjects

Three hundred eighty-seven of the 1000 subjects who received questionnaires returned them and constituted the sample. All individuals who appeared for a typing test were given a survey. It is not possible to determine how representative the 387 subjects were of the 1000 total group since no data exist for this larger sample.

Variables/Measures

1-The Propensity to Perceive Stress (PPS) was the experimental measure developed in this study (see appendix 1). The reliability and validity of this scale was assessed in this current study. This measure was developed to reflect real life; scenarios were obtained from interviews. Many items included a combination of positive and negative aspects in order to reflect real life. Additionally, a sample of work and leisure stress situations was included. Average individual responses represent scoring for this measure.

2-The Pennebaker Inventory of Limbic Languidness (PILL) taps the frequency of occurrence of a large number of physical symptoms. This measure has been discussed in Chapter 6. The PILL is scored by summing all items for which the subject responds C, D, or E. (see appendix 3, page 9). Pennebaker felt that infrequent occurrences of these behaviors constituted chance. Coefficient alpha for this measure has been reported to be .91. Test-retest reliability has been reported at .83.

3-The Satisfaction With Life Scale (SWLS) was developed by Diener, Emmons, Larsen and Griffin in 1985. This scale is scored by summing subject responses to all items. The authors report a test-retest reliability of .82 and coefficient alpha at .87. The SWLS was correlated an average of .57 with other measures of global satisfaction. This measure was negatively correlated with personality measures such as neuroticism and impulsivity (see appendix 3, page 2).

4-The Alienation-Involvement (A-I) scale was developed by Lefkowitz (Lefkowitz, Somers and Weinberg, 1986; Lefkowitz & Iorizzo, 1989). Responses are averaged after some items are reverse scored. The coefficient alpha reliability on this scale has been reported as .89 (see appendix 3, page 3).

5-The Negative-Positive Affectivity scale was developed by Watson. No reliability or validity data are available on this scale. Responses are added to

form positive and negative affectivity scores. That is, separate items are added to form two scales: Negative affectivity and Positive affectivity. There is no overlap of items in each scale (see appendix 3, page 4).

6-The behavior measure was a simple checklist of the frequency of occurrence of "nervous" behaviors (see appendix 4 for a list). All behaviors were visually observed by the examiner except for cold hands which was observed while fingerprinting. The frequency of occurrence of each behavior was recorded by the examiner. A total number of the frequency of all behaviors was used to form the behavior variable used in the analysis.

7- The anxiety error measure was a count of the total number of spacing errors committed by each candidate. This number was calculated and recorded by the examiner when grading the typing tests.

8- Self-reported test anxiety. This ad hoc measure is presented in Appendix 2. Subjects were asked about their degree of "nervousness" before and during the typing test. An ad hoc measure was developed because the City of New York, Department of Personnel would only permit a measure which they participated in developing to be administered to candidates. The reliability of this measure will be investigated.

Data Analysis

The propensity to perceive stress was a newly developed scale, therefore, the reliability and validity was assessed. Factor and item analyses were performed. Coefficient alpha was calculated. As an assessment of convergent validity the propensity to perceive stress was correlated with behavioral observations of anxiety, reported test anxiety, and the PILL. The behavioral observations and anxiety errors were not collected via self-report, therefore any correlation involving these variables can not be due to common method variance.

The remaining variables have often been linked to stress, therefore, they served to support the construct validity of this measure.

The reliabilities of all measures were assessed.

A path analysis was performed based on the paths outlined in the hypotheses and figure 5.

SPSS PC+ was used for all analyses except the path analysis. LISREL VI (Joreskog & Sorbom, 1986) was used for the path analysis. The LISREL VI structural equation program was used to test the fit of the sample data to the path models.

Factor Analysis

Factor analysis is used "to summarize the interrelationship among the variables in a concise but accurate manner as an aid in conceptualization"

(Gorsuch, 1983, p. 2). "The basic assumption of factor analysis is that underlying dimensions, or factors, can be used to explain complex phenomena" (Norsis/SPSS inc., 1988, p. B-42).

There are several factor-extraction techniques available for use in factor analysis. It is beyond the scope of this paper to discuss these methods in detail. However, for clarity, a Table adapted from Gorsuch (1983) is presented here. See Table 2 below.

TABLE 2

Comparison of exploratory factor extraction procedures

Type of Analysis	*Principle of Extraction*	*Definition of Uniqueness*	*Communality Estimates*	*Factor Scores*
Principal Components	Variance accounted for is maximized	none	none needed	Calculated
Principal Axis	Variance accounted for is maximized	Specific Factor, random error	Estimation procedures are numerous	Estimated
Minimum Residual	Off diagonal residuals are maximized	Specific Factor, random error	Iterates to appropriate estimates	Estimated
Maximum-Likelihood	Best estimate of reproduced correlation matrix in the population	Specific Factor, random errors	Iterative	Estimated

Adapted from Gorsuch (1988 p. 122)

Essentially, principal axis factor analysis is an often used approach mainly because the principle of extraction maximizes variance accounted for. However, in a summary of empirical studies offered by Gorsuch (1983), it appears that many methods yield similar results. The maximum-likelihood method is more accurate than other procedures given a large sample size (Gorsuch, 1983). Another advantage of the maximum-likelihood method is that tests of significance have been derived. Due to these considerations, the maximum-likelihood method of factor extraction was used.

The next consideration in using a factor analysis is the selection of a rotation method. "Since one of the goals of factor analysis is to identify factors that are substantively meaningful (in the sense that they summarize sets of closely related variables) the rotation phase of factor analysis attempts to transform the initial matrix into one that is easier to interpret" (Norsis/SPSS inc. 1988, p.B-53). Rotation does not affect the goodness of fit of a factor solution. Rather, rotation simply redistributes the explained variance for the individual factors. There are two basic categories of rotation methods: orthogonal and oblique. Orthogonal rotations assume that the factors are uncorrelated (i.e. that they are orthogonal or perpendicular to each other). Oblique rotations allow some correlation between factors. Because it is assumed that there may be some correlation between factors both orthogonal and oblique solutions were attempted.

Path Analysis

Hypothesis 9 required the examination of several alternate path models. "Causal modeling attempts to resolve questions about possible causes—providing explanations of phenomena (effects) as the result of previous phenomena (causes)" (Asher, 1976). James, Mulaik & Brett (1983) outline the conditions which must exist prior to the use of causal analysis:

"(1) formal statement of theory in terms of a structural model,

(2) theoretical rationale for causal hypotheses,

(3) specification of causal order,

(4) specification of causal direction,

(5) self—contained functional equations,

(6) specification of boundaries and

(7) stability of the structural model" (p. 26).

In other words, a causal model should not be applied in *any* situation to *any* data. Rather, the researcher must have a preconceived idea of a rationale (theory) for the model. The order and causal direction must be specified prior to the application of this statistical technique. The functional equations which form the model must be conceptualized. Lastly, The conditions under which the model will be true must be specified. Causal analysis is <u>not</u> an exploratory data technique. The researcher must have a sound theory grounded in research in order to consider using causal analysis. This is not to say that alternate models cannot be tested. Alternate theoretical perspectives can be tested using causal analysis.

The LISREL VI program used to analyze all path models uses maximum likelihood estimation to yield path coefficients for hypothesized models.

Fit indices

One positive value of using the LISREL program is the provided fit indices. LISREL provides two types of fit indices — those used to evaluate the overall fit of the data to the model and those used to evaluate individual model parameters. These indices should be evaluated together to get an overall view of fit. No index should be considered absolute. A bad fit on any one index should not be cause to eliminate the model.

Overall Fit Indices

Chi-Square (χ^2)

The χ^2 is a measure of the goodness of fit of the overall model. However, Joreskog & Sorbom (1986) caution that "the χ^2 measure is sensitive to sample size and very sensitive to departures from multivariate normality of the observed variables. Large sample sizes and departures from normality tend to increase χ^2 over and above what can be expected due to specification error in the model" (p. I.39). Generally, the smaller the χ^2 and the closer in value it is to the degrees of freedom, the better the fit of the model.

The Normed Fit Index (NFI)

The NFI (Bentler & Bonett, 1980) was developed in response to the problems associated with χ^2. The NFI is derived from the following equation:

$$NFI = (\chi^2_o - \chi^2_i) / \chi^2_o$$

where χ^2_o refers to the null model χ^2 and χ^2_i refers to the hypothesized model χ^2. The NFI ranges from 0 to 1.00. The null model assumes no paths between variables and no consistent correlation between the predictors and criteria. The NFI represents the improvement in fit of a hypothesized model over a model with no hypothesized paths. The NFI is less sensitive to sample size than the χ^2. Generally, a NFI of .90 or better indicates a good fit (Byrne, 1989).

The Goodness of Fit Index (GFI)

LISREL produces a Goodness of Fit Index which corresponds to the relative amount of variance and covariance jointly explained by the specified model (Byrne, 1989). The GFI like the NFI is less sensitive to sample size than the χ^2. The GFI is also reasonably robust against deviation from normality (Joreskog & Sorbom, 1986). Also, like the NFI, the GFI ranges from 0 to 1.00 and values close to .90 or higher suggest a good fit.

Root Mean Square Residual (RMSR)

LISREL also produces the Root Mean Square Residual index of fit. The RMSR is a reflection of the average difference between the observed and

reproduced covariance matrix. The higher the RMSR, reflecting a large difference, the poorer the fit.

Individual Fit Indices

T-Values

T-values are provided for each path estimate in the LISREL output. Significant paths are considered integral to the model. A t-value of +/- 2.00 or greater is considered statistically significant (Byrne, 1989). The interpretation of t-values is dependent on an adequate fit of the overall model.

The LISREL program allows the programmer to use a correlation or covariance matrix. Most often the correlation matrix is selected. In the present study, the correlation matrix is used as the input data for all path models. Listwise deletion of missing data was used in the preparation of the correlation matrix.

CHAPTER 8

RESULTS

Composition of the sample:

The surveys were administered to 1000 subjects. Three hundred eighty—seven (387) subjects responded. Two subjects' responses were eliminated due to insufficient number of responses in each survey. This represents a 38.7% response rate. All missing data was deleted listwise.

Ninety-three percent (93%) or 360 respondents were female. Five percent (5%) or 19 subjects were male. Subject age ranged from 18 - 62 years with a mean at 31.13. Fifty-eight percent (58%) or 225 subjects were black, fifteen percent (15%) or 60 respondents were spanish or of hispanic descent, 11.6% or 45 subjects were white and 8% or 31 respondents were asian. Much of the sample (49%) were single without children (39%). Seventy-six percent (76%) of the sample was either a high school graduate or had some college education. Fifty-eight percent (58%) of the sample was employed full time and fifty-three percent (53%) had job tenure of 1 - 3 years. Tables 3 through 7 contain a complete description of the sample.

TABLE 3

Number and percent breakdown of study sample by sex.

	SEX	
	MALE	FEMALE
%	5%	93%
#	19	360

No answer=8.

TABLE 4

Number and percent breakdown of study sample by ethnicity

	ETHNICITY			
	WHITE	BLACK	SPANISH	OTHER
%	12%	58%	15%	10.8%
#	45	225	60	42

No answer = 15

TABLE 5

Number and percent breakdown of study sample by marital status

MARITAL STATUS			
	SINGLE	MARRIED	DIVORCED
%	49%	30%	16%
#	191	117	60

No answer = 19

TABLE 6

Number and percent breakdown of study sample by educational level

EDUCATIONAL LEVEL				
	Some High School	High School Graduate	Some College	College Graduate or Higher
%	17%	37%	39%	12%
#	39	145	149	45

No answer = 9

TABLE 7

Number and percent breakdown of study sample by employment status

	EMPLOYMENT STATUS		
	UNEMPLOYED	PART-TIME	FULL-TIME
%	25%	14%	58%
#	97	54	226

No answer = 10

Tables 8 through 12 present the means of the major study variables by demographics. Overall, the major study variables do not seem to differ within the demographic categories.

TABLE 8

Mean, standard deviation and variance of study variables by sex

Variable	MALE			FEMALE		
	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
P.I.L.L.	1.487	.476	.226	1.600	.409	.167
P.P.S.	3.115	.766	.587	3.186	0476	.226
Alienation/ Involvement	3.624	.573	.328	3.221	.581	.337
Life Satisfaction	4.178	1.718	2.950	3.997	1.337	1.786
Negative Affectivity	.825	.599	.359	.694	.532	.283
Positive Affectivity	1.289	.471	.222	1.369	.477	.228
Anxiety Behaviors	.053	.092	.009	.049	.091	.008
Anxiety Errors	.105	.187	.035	.148	.388	.151
Test Anxiety	3.171	1.498	2.242	3.697	1.458	2.126

Number male = 19

Number female = 368

TABLE 9

Mean, standard deviation, and variance of study variables by ethnicity

Variable	WHITE			BLACK			SPANISH			OTHER		
	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
P.I.L.L.	1.509	.297	.088	1.633	.431	.186	1.574	.364	.133	1.529	.433	.188
P.P.S.	3.291	.485	.236	3.175	.512	.262	3.161	.396	.157	3.247	.478	.228
Alienation / Involvement	3.074	.603	.363	3.212	.591	.350	3.377	.498	.248	3.361	.624	.389
Life Satisfaction	4.073	1.263	1.593	3.922	1.371	1.879	4.093	1.342	1.801	4.095	1.351	1.825
Negative Affectivity	.756	.605	.366	.708	.523	.274	.660	.552	.304	.659	.494	.244
Positive Affectivity	1.444	.465	.216	1.345	.470	.221	1.302	.539	.290	1.424	.420	.176
Anxiety Behaviors	.048	.105	.011	.054	.096	.009	.036	.056	.003	.050	.086	.007
Anxiety Errors	.131	.279	.078	.119	.222	.049	.138	.258	.067	.286	.892	.796
Test Anxiety	3.971	1.545	2.388	3.713	1.471	2.165	3.604	1.239	1.535	3.244	1.629	2.652

Number white = 45, black = 225, spanish = 60, other = 40

TABLE 10

Mean, standard deviation and variance of study variables by marital status

	SINGLE			MARRIED			DIVORCED		
Variable	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
P.I.L.L.	1.657	.416	.173	1.520	.402	.161	1.571	.422	.178
P.P.S.	3.193	.506	.256	3.192	.504	.254	3.149	.455	.207
Alienation / Involvement	3.234	.559	.312	3.226	.647	.419	3.293	.513	.264
Life Satisfaction	3.972	1.338	1.791	4.368	1.353	1.830	3.428	1.264	1.598
Negative Affectivity	.784	.536	.288	.604	.491	.241	.675	.575	.331
Positive Affectivity	1.356	.448	.200	1.402	.508	.258	1.255	.523	.273
Anxiety Behaviors	.044	.089	.008	.054	.092	.008	.061	.099	.010
Anxiety Errors	.127	.265	.070	.192	.560	.314	.082	.133	.018
Test Anxiety	3.754	1.446	2.091	3.446	1.384	1.915	3.509	1.547	2.393

Number single = 191, married = 117, divorced = 60

TABLE 11

Mean, standard deviation and variance of study variables by education

Variable	Some High School			High School Graduate			College			College Graduate		
	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
P.I.L.L.	1.439	.290	.084	1.617	.408	.167	1.612	.423	.179	1.605	.464	.215
P.P.S.	3.154	.573	.325	30154	.489	.239	3.204	.495	.245	3.249	.438	.192
ALIENATION/INVOLVEMENT	3.452	.518	.268	3.219	.607	.369	3.288	.586	.344	3.138	.521	.271
LIFE SATISFACTION	4.249	1.104	1.219	3.923	1.344	1.806	4.097	1.380	1.905	3.809	1.437	2.065
NEGATIVE AFFECTIVITY	.494	.388	.150	.744	.541	.293	.703	.552	.304	.747	.534	.286
POSITIVE AFFECTIVITY	1.410	.588	.311	1.355	.502	.252	1.364	.443	.196	1.302	.454	.206
ANXIETY BEHAVIORS	.056	.123	.015	.050	.096	.009	.044	.068	.005	.055	.076	.006
ANXIETY ERRORS	.154	.213	.045	.137	.491	.241	.162	.331	.110	.103	.165	.027
TEST ANXIETY	3.776	1.223	1.496	3.601	1.460	2.131	3.722	1.524	2.322	3.545	1.515	2.294

Number Some high school = 39, High school graduate = 145, some college, 149, college graduate = 45

TABLE 12
Mean, standard deviation and variance of study variables by employment status

Variable	UNEMPLOYED			PART-TIME			FULL-TIME		
	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
P.I.L.L.	1.504	.393	.155	1.576	.378	.143	1.632	.418	.175
P.P.S.	3.127	.552	.305	3.194	.515	.265	3.203	.463	.214
ALIENATION/ INVOLVEMENT	3.256	.574	.330	3.323	.509	.259	3.212	.609	.371
LIFE SATISFACTION	3.708	1.458	2.126	4.012	1.270	1.612	4.136	1.311	1.719
NEGATIVE AFFECTIVITY	.596	.524	.275	.604	.505	0255	.767	.540	.291
POSITIVE AFFECTIVITY	1.353	.467	.218	1.426	.485	.236	1.350	.487	.257
ANXIETY BEHAVIORS	.051	.095	.009	.059	.092	.008	.045	.083	.007
ANXIETY ERRORS	.171	.603	.364	.143	.225	.051	.134	.271	.074
TEST ANXIETY	3.972	1.446	2.092	3.971	1.560	2.433	3.446	1.421	2.020

Number unemployed = 97, part-time = 54, full time = 226

Reliabilities of surveys and item statistics:

Coefficient alpha internal consistency reliabilities were conducted for all relevant surveys. The results are presented in Table 13.

TABLE 13

Reliabilities of major study variables

VARIABLE	ALPHA	# ITEMS
ALIENATION-INVOLVEMENT	.81	15
NEGATIVE AFFECTIVITY	.85	14
POSITIVE AFFECTIVITY	.72	9
PPS	.89	30
LIFE SATISFACTION	.85	5
TEST ANXIETY	.75	4
PILL	.95	54

The behavioral observation of test anxiety variable is not included in the above analysis because as an observation, coefficient alpha is not an appropriate statistic for this variable. This same reasoning holds true for the anxiety error variable. The anxiety error variable is simply a count of the number of anxiety errors committed by the subject. An anxiety error is a word or line spacing error.

It is considered an anxiety error because it is committed when the subject is distracted by anxiety.

The corrected item-total correlation and the overall alpha if the item was deleted was examined for the experimental PPS scale. The analysis did not indicate that any of the items should be deleted (see Appendix 5). Therefore, for the purposes of the current analysis, the scale remains at 30 items.

Intercorrelations and supported hypotheses:

Table 14 contains the intercorrelations between all relevant variables.

TABLE 14
Intercorrelations of all study variables

VARIABLES	P.P.S.	P.I.L.L.	Alienation / Involvement	Life Satisfaction	Negative Affectivity	Positive Affectivity	Test Anxiety	Anxiety Behaviors	Anxiety Errors
P.P.S.	1.000								
P.I.L.L.	.258**	1.000							
Alienation / Involvement	-.174**	-.175**	1.000						
Life Satisfaction	-.165**	-.158**	.126*	1.000					
Negative Affectivity	.307**	.452**	-.240**	-.197**	1.000				
Positive Affectivity	-.120*	-.234**	.118*	.337**	-.339**	1.000			
Test Anxiety	.099*	.106*	.122*	-.032	.040	.049	1.000		
Anxiety Behaviors	.059	-.034	.113*	-.064	-.047	.039	.138*	1.000	
Anxiety Errors	.008	.099	-.019	-.060	-.004	.025	.080	-.045	1.000

* p=.05 N= 344
** p= .01

Hypothesis one predicted that PPS and Life satisfaction (LS) were negatively correlated. As illustrated in Table 14, the correlation between these two variables was -.165** ($p = .01$). Thus PPS and LS are significantly negatively correlated. In other words, individuals who are satisfied with their lives are less likely to perceive stress in ambiguous situations than those who are not satisfied with their lives.

Hypothesis two predicted that PPS and A-I are positively correlated. Lefkowitz, et.al. (1986) hypothesized that alienation and involvement were at opposite ends of the same continuum. As such, one could predict either that alienation and PPS are positively correlated - or - that involvement and PPS are negatively correlated. In the present case, items were scored such that involvement is the variable represented by the A-I label. As illustrated in Table 14, the correlation between involvement and PPS was -.174** ($p = .01$). Thus PPS and involvement are significantly negatively correlated as predicted. In other words, individuals who are highly involved in their work (or alternately alienated in their work) are not likely (or are likely, if alienated) to perceive stress in an ambiguous situation.

Hypothesis three predicted that PPS and reported stress behavioral consequences as measured by the Pennebaker Inventory of Limbic Languidness (PILL) are positively correlated. As illustrated in Table 14, the correlation between PPS and the PILL is .258** ($p = .01$). In other words, individuals who

reported a large number of physical symptoms are more likely to perceive stress in an ambiguous situation than those who do not report a large number of physical symptoms. Inasmuch as the PILL has been used as a physiological measure of stress, support of a strong positive relationship between these two variables lends credence to the hypothesis of PPS as a stress measure.

Hypothesis 4 predicted a positive correlation between PPS and observed test anxious behaviors. As illustrated in Table 14, the correlation between PPS and test anxious behaviors is .059. Although this correlation is positive, it is not significant. Lack of significance is most likely due to the small number of individuals who exhibited the targeted behaviors. It should be made clear that the behaviors are observed over a period of about five (5) minutes. This is a relatively short period of time in which subject behavior is observed. Additionally, many individuals may have exhibited targeted behaviors several hours or days prior to the test administration. Such previous behaviors were not within the purview of the current situation. Therefore, it appears hypothesis 4 was not supported.

Hypothesis 5 predicted a positive correlation between PPS and negative affectivity (NA). As illustrated in Table 14, the correlation between PPS and NA is .307** ($p = .01$). Thus PPS and NA are rather moderately positively correlated. That is, individuals high in negative affectivity are more likely to perceive stress in an ambiguous situation than those low in NA. Negative

affectivity has been previously linked to stress (see chapter 5), thereby suggesting PPS is actually measuring stress.

Hypothesis 6 predicted a negative correlation between PPS and positive affectivity (PA). As illustrated in Table 14, the correlation between PPS and PA is -.120* (p = .05). Thus PPS and PA are significantly negatively correlated. That is, individuals with a positive outlook are less likely to perceive stress in an ambiguous situation than those without a positive outlook. PA like life satisfaction is a variable representing positive life outlooks. It is not surprising therefore, that PA and LS are positively correlated (.337**, p = .01).

Hypothesis seven predicted a positive correlation between self-reported test anxiety and the Propensity to Perceive Stress. As illustrated in Table 14, the correlation between PPS and self-reported test anxiety is .099* (p= .05). Thus, PPS and test anxiety are significantly positively correlated. That is, individuals in the propensity to perceive stress are more likely to report feelings of test anxiety than those low in the propensity to perceive stress. It should be noted that this correlation is rather weak. Most likely, this weakness is due to the test anxiety variable which is composed of only four items.

Hypothesis eight predicted a positive correlation between the propensity to perceive stress and anxiety errors in typing. As illustrated in Table 8, the correlation between the propensity to perceive stress and anxiety errors is .008.

Thus PPS and anxiety errors are not significantly correlated. In fact the anxiety error variable is not significantly correlated with any of the study variables. This lack of significance could either indicate that these variables are unrelated -or- that the anxiety error measure is not reflecting what it is intended to reflect.

From the supported hypotheses above it can be tentatively concluded that PPS appears to be measuring something close to stress. However, in order to securely make this statement, more rigorous data analysis must be conducted. Correlational analysis merely indicates association between two variables. This association can be due to common method variance or actual shared variance. In order to determine if the Propensity to Perceive Stress is indeed measuring the same factor as these related variables, additional research is needed, such as factor analysis.

Results of the Factor analyses:

The propensity to perceive stress factor analysis

Prior to examining the interrelationships of the study variables, the factor structure of the experimental propensity to perceive stress measure had to be examined. That is, it was hypothesized that the propensity to perceive stress scale reflects one construct — stress. This hypothesis had to be tested. One means of testing this hypothesis is through the use of factor analysis.

The statistics involved in performing a factor analysis require a large sample size in relation to the number of items. Therefore, the first factor analysis performed used a random clustering of the propensity to perceive stress items to

form ten (10) variables. These ten variables were then factor analyzed using raw data. The results are presented in Appendices 6 and 7. These 10 variables converged on one factor in a maximum likelihood confirmatory factor analysis. The χ^2, percentage of variance accounted for by the model, and percentage of significant residuals are presented in appendix 7. These results are mildly supportive of a single factor model.

When survey items are grouped together, as was done above, to form a smaller number of items, the likelihood of a one factor solution increases. Therefore, using the 30-item raw data scale for the propensity to perceive stress, a confirmatory maximum-likelihood factor analysis was performed. The results are presented in appendices 7 and 8. The χ^2, percentage of variance accounted for and the percentage of significant residuals seem to suggest that the propensity to perceive stress data do not fit a one factor solution very well. This would suggest that perhaps the propensity to perceive stress scale is measuring more than on factor.

Since it appeared that a one factor solution did not fit the data, a maximum-likelihood two-factor confirmatory factor analysis was performed on the 30-item propensity to perceive stress scale. The fit of this data to the 2-factor solution is presented in appendix 7. The oblique rotated factor structure solution is presented in appendix 9. The results of this analysis do not seem to suggest that the 2-factor solution is very much better than the 1-factor solution. That is, only 8% more variance is accounted for in the 2-factor solution than in the 1-factor solution. Additionally, upon examination of the items which compose each

factor, it is very difficult to identify what these factors represent. That is, the items forming factor one do not reflect one factor. Some items reflect job stress, some reflect life stress, others reflect daily hassles while still others reflect a single stress episode. The same holds true for item composing factor two. Therefore, it does not appear that the 2-factor solution makes intuitive sense. One means of judging the fit of data to a factor solution is the ease of interpretation of that solution. In the case of the 2-factor solution, interpretation is difficult.

Overall, the results of the three factor analyses do not allow firm conclusions regarding the propensity to perceive stress scale. The results do seem to suggest that a single factor model does not fit. Perhaps these results are due to a relatively homogenous sample of volunteers. Clearly, more research is needed.

The factor analysis of the major study variables

The first model attempted contained nine (9) variables: PPS, PILL, A-I, LS, NA, PA, TA, Anxiety Behaviors, and Anxiety Errors. Maximum likelihood estimation with an oblique or orthogonal rotation using an input correlation matrix yielded four (4) factors. The chi-square was not significant indicating that the model fits the data. Upon close examination of the variance accounted for in each variable, it was clear that the error variable was not well represented (communality = .024). Additionally, it was difficult to interpret the results yielding four factors (see Appendix 10 for the results of the oblique rotation of this model). Therefore, an alternative model using 8 variables was employed.

The eight variable model yielded three (3) factors. Again, the chi-square indicated a good fit. The orthogonal and oblique solutions yielded essentially the same results. The oblique rotated factor structure matrix is presented in Table 15 below.

TABLE 15

Oblique rotated factor structure matrix

VARIABLES	FACTOR 1	FACTOR 2	FACTOR 3
POSITIVE AFFECTIVITY	.99306	-.30515	.11455
LIFE SATISFACTION	.35441	-.26193	-.03246
NEGATIVE AFFECTIVITY	-.38883	.70689	-.08334
PILL	-.28667	.61335	.03047
PPS	-.16372	.45163	.08151
A-I	.12360	-.33686	.30778
TEST ANXIETY	.00114	.11694	.49732
BEHAVIOR - TA	.01773	-.03400	.31682

N = 344

The shaded areas on Table 15 represent the main factor upon which each variable loads. It can be seen that positive affectivity and life satisfaction load

primarily on Factor 1; negative affectivity, PILL, PPS, and A-I load primarily on Factor 2; test anxiety and behavior load primarily on Factor 3. Based on these results, the factors are labelled as: Factor 1 = positive disposition; Factor 2 = Stress; Factor 3 = test anxiety. Factor 1 is labelled positive disposition because PA is nearly completely accounted for by this factor (.99) and LS also represents a positive disposition. Factor 2 is labelled Stress because PPS and related consequences all load on factor 2. Factor 3 is labelled test anxiety because both self-reported test anxiety and observed test anxious behaviors load on factor 3. (See the Discussion for a more in depth discussion of factor loadings).

An examination of the residual variance between the observed and reproduced correlations indicated that only two were significant at p = .05. The fact that this number is small, indicates the number of extracted factors is appropriate (Gorsuch, 1983) (see Appendix 11).

Table 16 presents the variable communalities and cumulative percentage of variance accounted for by the model. "The communality of a variable is that proportion of its variance that can be accounted for by its common factors" (Gorsuch, 1983, p. 29). For example, for the PA variable, the communality is .99. This indicates that the variance of the variable is nearly accounted for. It can also be seen in this table that for the behavioral observations and for life satisfaction only a small amount of variance is accounted for by the common factors. Thus indicating that variables not included in the current research which may relate to these variables should be included. It should be noted that it is very difficult to include enough variables so that all communalities are high

(especially given the constraints of field research). While inclusion of additional variables might have positive consequences for this factor model, the response rate probably would have decreased significantly while cost would have increased significantly.

TABLE 16

COMMUNALITIES AND VARIANCE ACCOUNTED FOR

VARIABLE	COMMUNALITY	FACTOR	EIGENVALUE	VARIANCE ACCOUNTED FOR BY THE MODEL
P.P.S.	.21265	1	1.31607	16.5
P.I.L.L.	.38137	2	1.06157	29.7
ALIENATION / INVOLVEMENT	.20346	3	.45061	35.4
LIFE SATISFACTION	.14631			
NEGATIVE AFFECTIVITY	.51920			
POSITIVE AFFECTIVITY	.99900			
TEST ANXIETY	.26516			
ANXIETY BEHAVIORS	.10109			

NOTE: SPSS PC+ REPORTS THE EIGENVALUES AND CUMULATIVE VARIANCE ACCOUNTED FOR ONLY FOR THE NUMBER OF FACTORS INCLUDED IN THE MODEL. 35.4 % REPRESENTS THE TOTAL VARIANCE ACCOUNTED FOR BY FACTORS 1, 2 AND 3.

Overall, the chi-square, small residual variance and ease of interpretation of the results of this model suggest a good fit of the data to the 3-factor solution.

Factor analysis of the propensity to perceive stress and negative affectivity

Although 11 years old, the concept of Negative Affectivity is still questioned. Many researchers question whether Negative Affectivity is distinct from stress (or vice versa). While the purpose of this study is NOT the delineation of Negative Affectivity and Stress, the notion that both are really one variable is certainly related to measures of stress. Additionally, inasmuch as Stress and Negative Affectivity load on the same factor, the convergent validity of the stress variable is effected.

Therefore, to demonstrate that Negative Affectivity and Stress are indeed different variables both measures were used in a factor analysis. Item level scales of Negative Affectivity and the Propensity to Perceive Stress were subjected to factor analysis. Because the factor analysis requires a larger sample size than was available in this study for the analysis of many-item scales, the PPS and NA scales were each randomly grouped to form four NA items and five PPS items. These newly formed items were subjected to two maximum-likelihood factor analyses. One analysis predicted a one factor solution while the other analysis predicted a two factor solution. A comparison of the fit of both models to the data should indicate whether negative affectivity and the propensity to perceive stress are reflecting one or two factors. A comparison of the fit of both models is presented in appendix 12. The χ^2 of the two factor solution is much smaller than that of the one factor solution. The total percentage of variance accounted for by the model and the percentage of significant residuals are larger and smaller respectively on the two factor than in the one factor solution. This suggests that

the two factor solution "fits" better than the one factor solution. The results of the oblique rotated two factor solution are presented in Appendix 13. Basically, Negative Affectivity and the Propensity to Perceive Stress yielded two factors--one negative affectivity and one stress. The Negative Affectivity scale loaded completely on only one variable while the Propensity to Perceive Stress loaded on a separate variable. This seems to suggest that while Negative Affectivity and the Propensity to Perceive Stress may share variance, they are not the same variable. The nature of this difference can only be speculative at this point and is beyond the scope of the current research.

Results of the hypothesized path models

1- The first model to be analyzed was the null model which does not contain any hypothesized paths. The results of this analysis are presented in appendix 14.

2- In figure 6 below, negative and positive affectivity are predicted to be causally prior to the Propensity to Perceive Stress. These variables constitute antecedents which affect whether stress is perceived. Alienation, the PILL, behaviors, test anxiety and typing errors are predicted to be consequences of stress. Life satisfaction is predicted to be consequent to alienation and the PILL. No path from the Propensity to Perceive Stress and life satisfaction is predicted.

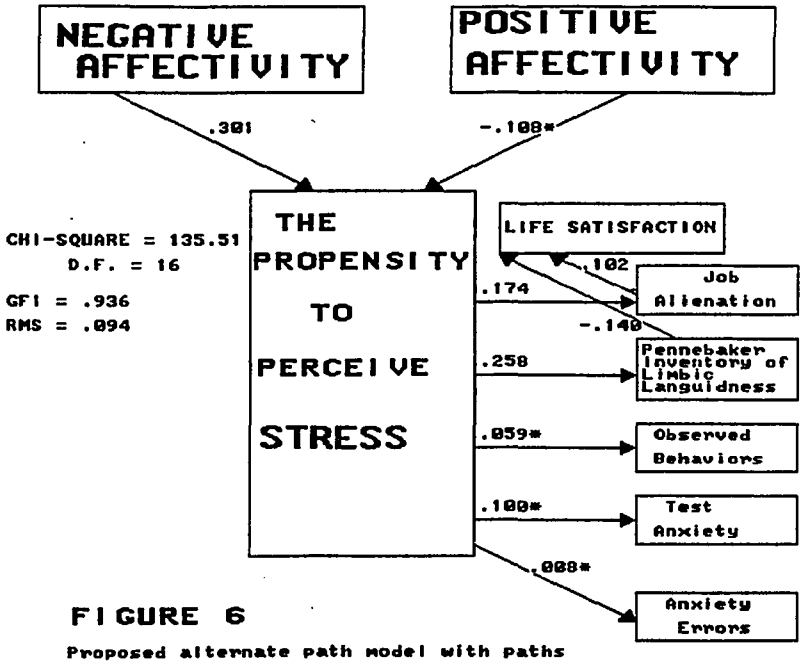

FIGURE 6

Proposed alternate path model with paths from Job alienation and Pennebaker inventory of limbic languidness to Life satisfaction.

Note: * path is not significant

In this model, the χ^2 is large in comparison to the degrees of freedom, thus indicating a bad fit of the data to the model. The GFI is above .90 which indicates adequate fit. However, the RMSR and NFI do not indicate a good fit. Overall, it can be concluded that for this model, the data do not fit the hypothesis.

3- In figure 7 below, negative and positive affectivity are hypothesized to be bicausally related to the Propensity to Perceive Stress. Because little research exists regarding when negative and positive affectivity emerge in an individual, it is hypothesized here that negative and positive affectivity and the Propensity to Perceive Stress emerge at approximately the same time.

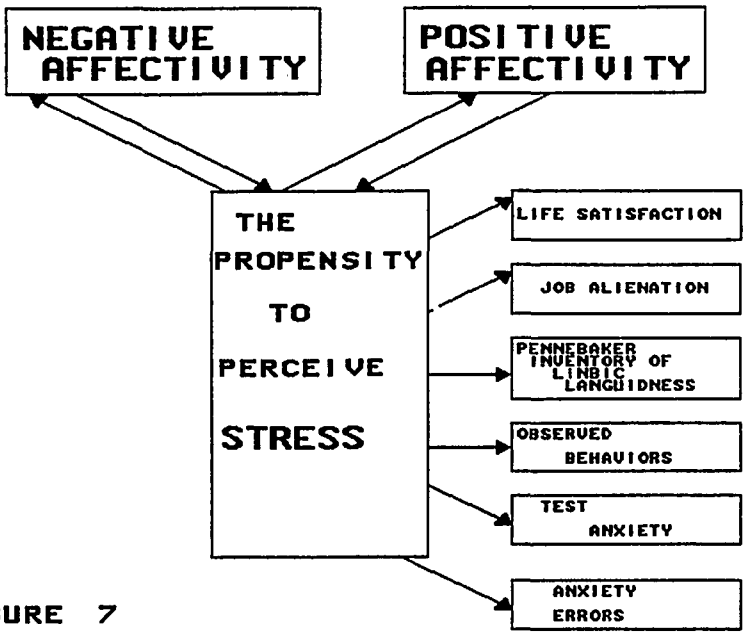

FIGURE 7

Alternate non-recursive path model with bidirectional paths between the propensity to perceive stress, negative affectivity and positive affectivity

In this model, the data would not converge to reach path estimates, thus indicating a bad fit of the data to the hypothesized model.

4- In figure 8 below, it is hypothesized that negative and positive affectivity do not play a role in the stress process.

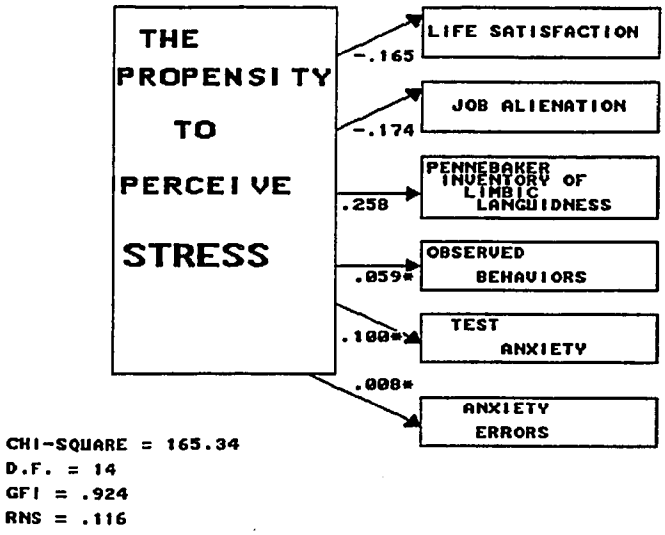

FIGURE 8

Alternate path model without negative and positive affectivity.

Note: * non-significant path

In this model, like that in figure 6, the χ^2, RMSR and NFI all indicate lack of fit while the GFI is adequate. When comparing the results of this model with figure 6 (see appendix 14 for a comparison), it can be concluded that this model does not fit as well as the model in figure 6.

5- Figure 9 below, represents the variables as suggested in the literature. Negative and positive affectivity are antecedent to the Propensity to Perceive Stress and life satisfaction, alienation, the PILL, behaviors, test anxiety and typing errors are consequent to the Propensity to Perceive Stress.

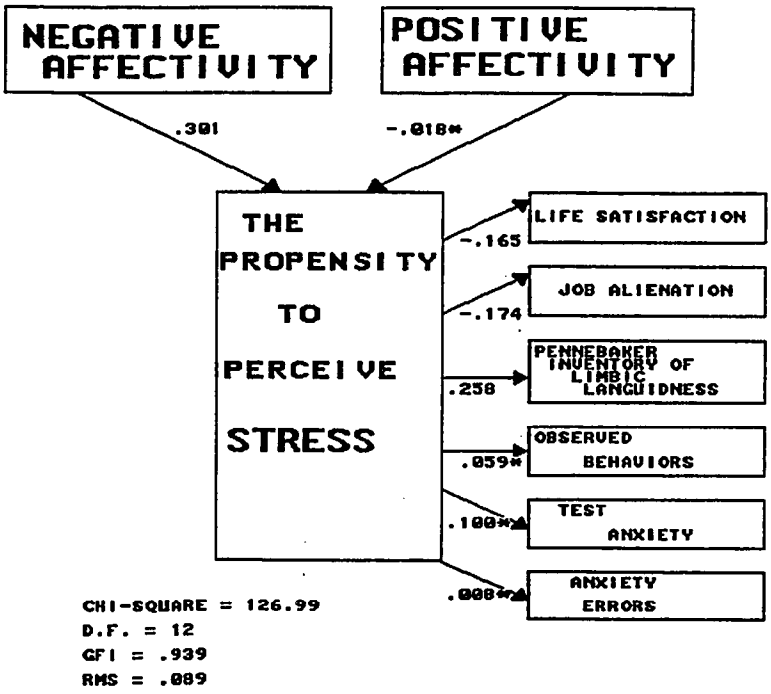

FIGURE 9
Current proposed path model.

Note: * non-significant path

The χ^2 of this model is smaller than that of any other model tested so far (see appendix 14), however, these results still do not suggest an excellent fit. The RMSR and GFI suggest an adequate fit of the data to the model. The NFI does not indicate a good fit. Overall, the results of this model are mixed and suggest an adequate fit of the data to the model.

6- Figure 10, below, expands on figure 9 by including paths from negative and positive affectivity to the final outcome variables. Indeed, the relationships between these variables are still experimental, therefore any model which makes intuitive sense should be attempted. In the present case, the path

from negative affectivity to alienation-involvement, the propensity to perceive stress, and the pennebaker inventory of limbic languidness and the path from positive affectivity to life satisfaction are supported by the results of the factor analysis conducted earlier. Specifically, the factor analysis linked negative affectivity with alienation-involvement, the propensity to perceive stress, and the pennebaker inventory of limbic languidness while positive affectivity was linked to life satisfaction.

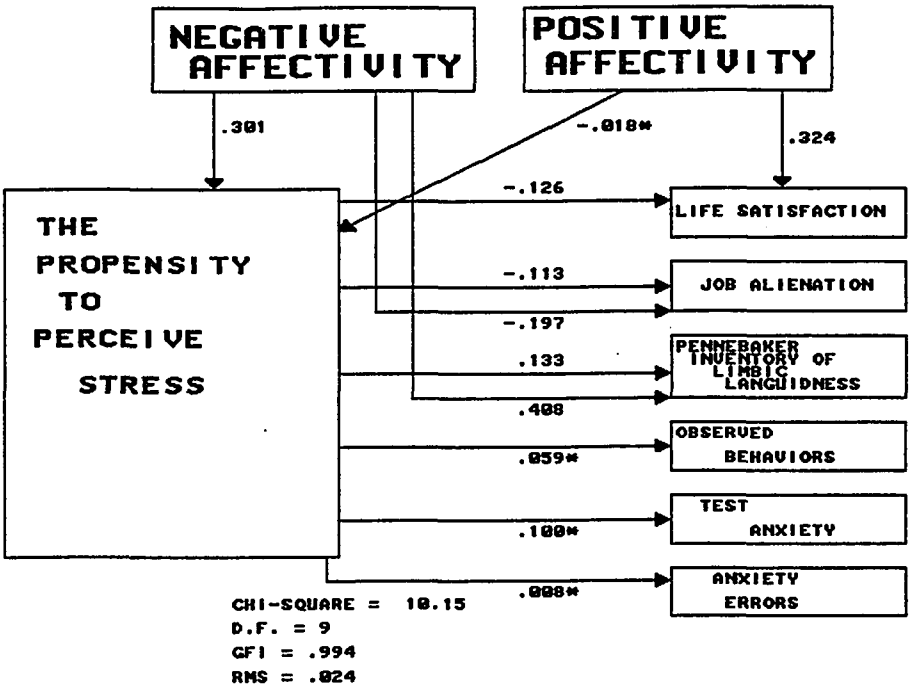

FIGURE 10
Negative and Positive affectivity linked to outcome variables

Note: * non-significant path

All the fit indices associated with this model indicate a good fit of the data to the model. the χ^2 is small relative to the degrees of freedom, the NFI and GFI indicate good fit as does the RMSR. Based on these positive results, this model appears to be the best model tested.

In conclusion, hypotheses four and eight were not supported. The factor analysis of the propensity to perceive stress variables requires additional research. All the remaining hypotheses were supported. Stress does appear to be related to the outcome variables as suggested.

CHAPTER 9

DISCUSSION

Stress is a construct centered around a good deal of confusion. As illustrated in the literature review, researchers seem to gloss over the definition of stress often confusing the notion with its outcomes or antecedents. Researchers who have directly and cogently addressed the definition of stress agree that it is a complex process of antecedents--stress--consequences. It was the purpose of this research to clarify the existing stress research by proposing and testing an alternative definition of stress based on the process of antecedents--stress--consequences. This definition was based on the notion that stress is a stable dispositional perception of a situation. This measure, termed the Propensity to Perceive Stress was developed and tested. Taken together, the results of this study seem to suggest that the Propensity to Perceive Stress appears to be measuring stress. Further, the model of antecedents leading to stress which in turn leads to consequences was tested and confirmed. Overall, the results of this study indicate that the stress process is composed of perceptual stress and consequent reactions.

The composition of the sample was fairly homogenous (i.e. 96% female, 58% black, 49% single, 58% employed and 76% with a high school education or better). For example, 58% of the sample was black. Future research should be

directed toward other groups of subjects. The generalizability of the current study is limited to black women.

The results of the present study indicate that negative and positive affectivity, alienation, the PILL, life satisfaction and test anxiety are all related to the Propensity to Perceive Stress as predicted in the hypotheses and literature review. The hypothesis which predicted a relationship between stress and observed behavior was not supported. Although positively correlated, the correlation did not reach significance. This was probably due to the fact that few individuals exhibited any observable stress behavior. It is possible that subjects actively "calm down" in order for them to perform well on the exam. Perhaps observation should take place prior to being admitted into the test room. These results confirm the hypothesis that the PPS measure is tapping the stress construct.

The results of the factor analysis of the propensity to perceive stress scale yielded mixed results. When items were grouped into 10 variables, the factor analysis results someshat support a one factor solution. Using 30 items, the factor analysis does not appear to support a one factor solution. However, a two factor solution of the 30-item scale is also not well supported. No firm conclusions can be made regarding the results of these factor analyses. Future research should focus on further exploration of this scale. Further construct validation work is needed.

The results of the factor analysis using negative affectivity and the propensity to perceive stress yielded positive results. These results seem to clearly suggest that negative affectivity and the propensity to perceive stress are separate constructs. While negative affectivity and stress are moderately correlated, they do not reflect the same construct.

The results of the factor analysis between the study variables seem to indicate that the Propensity to Perceive Stress scale appears to be measuring stress. It is interesting to note that although many researchers suggest stress can be positive—both Positive Affectivity and life satisfaction loaded on a separate factor than Propensity to Perceive Stress (the PPS scale has 9 positive statements). This would indicate that although these variables are correlated, they are representing two separate components. Perhaps those with a positive attitude and high in LS are more immune to stress than a dissatisfied, negative individual. This is an area for future research.

The factor analysis results also indicate that a total of 35% of the variance is accounted for by these variables. This suggests that additional variables should have been included. Future research should include additional personality measures and stress measures. The only antecedents included in the current research were Positive and Negative Affectivity. Antecedent variables in the stress model may be difficult or cumbersome to collect. Nonetheless, future research should endeavor to include such variables. Additionally, some of the outcome measures such as test anxiety and Behaviors are not well accounted for in this model. Perhaps this is due to the measurement device used. That is, life

satisfaction is composed of only five items and the Behavior scale has a very low observation rate. Additionally, variables other than those included here most likely would be relevant to the study of these variables.

The communality of the PPS scale is rather low indicating variables not measured here would contribute to variance in this variable. We have already discussed the inclusion of additional antecedent variables. In the current situation, a previous failure on the examination, whether or not the subject had a bad day or week or any additional personality disposition variables not measured may affect the results. Future research should be aimed at identifying and measuring such variables.

Even though the communalities are low for some variables, the factor analysis results are positive. One way to judge the results of a factor analysis is via the ease of interpretation. In the current situation, it is very easy to determine what constructs the 3 variables represent. Most variables load primarily on only one factor. This appears to indicate that these variables are relatively homogenous in nature. This is further supported by the results of the reliability analysis. The coefficient alpha would not be very high if the variables were not homogenous in nature.

It is informative to examine the individual factor loadings of each variable. Factor loadings are very telling regarding whether a variable is measuring one or more factors. The higher a single loading, the more security that the variable is measuring one factor. For example, the positive affectivity variable loading for factor one is .99. This is very high indicating that this variable's variance is nearly

completely accounted for by one factor. Most factor loadings for each variable are rather high on one factor. Two variables, however, life satisfaction and alienation, seem to have relatively high loadings on two factors. For life satisfaction, both factor loadings on one and two are relatively high with an absolute value difference of .10. Both loadings make intuitive sense if we consider Factor one to be positive disposition and Factor two to be stress. It is difficult to conclude the impact of such loadings on the interpretation of the "goodness" or "soundness" of the variable, especially based on this limited evidence. Further work on this variable is warranted. The same hold true to alienation. If this scale measures the continuum of alienation to involvement, then the factor loadings may make intuitive sense. That is, involvement is predicted to load negatively on stress while alienation should load positively on test anxiety. Again, future research is warranted.

The results of the path analysis also seem to support the hypotheses. Path analysis is a statistical technique used to confirm causality in a hypothesized set of variables. In the present case, the results confirmed that perceived stress leads to consequences. In other words, negative and positive affectivity lead to stress which in turn leads to the consequences of alienation-involvement, reported stress symptoms as reported by the Pennebaker Inventory of Limbic Languidness, test anxiety (both self-reported and observed), life satisfaction and typing errors. Thus the hypothesis that test anxiety is a result of stress is confirmed. This serves to distinguish stress and test anxiety. Most researchers blur the distinction between stress and anxiety. In the current research, as discussed earlier, anxiety is

conceptualized as the emotional resultant partner to stress. The role of negative and positive affectivity in the stress process was also explicated. According to the results of the path analysis, negative and positive affectivity not only affect stress, but they also directly affect some outcome variables. This seems to suggest that negative and positive affectivity are more contemporaneous than antecedent to stress. Again, this points to the need for inclusion/exploration of additional antecedent variables.

The conceptualization of negative and positive affectivity was also confirmed here. Based on the research on negative and positive affectivity, one can hypothesize that negative and positive affectivity are stable dispositional variables which develop at an early age and color the way life is perceived. As such, negative and positive affectivity affect our perceptions of stressful situations. That is, individuals who generally perceive of their world in a negative light will more likely perceive stress in ambiguous situations than those who perceive their world in a positive light.

The results of the current research confirm the conceptualization of stress proposed here. What does this mean for stress research? Future research should focus on changing the perceptions of individuals who are highly susceptible to stress and who exhibit stress' consequences. By changing perceptions, the individual can be made to see that a situation which they may ordinarily perceive as stressful can also be perceived as not stressful. Additionally, the impact of such perceptions on coping strategies should be investigated. Perhaps coping

strategies should focus on changing perceptions. The coping strategy of biofeedback is used to help the individual become more in touch with their feelings, perhaps it can also be used to aid the individual in changing perceptions. The impact of the current results are far reaching and will lead to fruitful future research.

APPENDIX 1

RESEARCH QUESTIONNAIRE

INTRODUCTION

This questionnaire is being used as research towards a doctoral dissertation. All of your responses will remain **anonymous** and **confidential**. It will be necessary to answer this questionnaire twice to obtain reliability information.

In this questionnaire you will read a series of potential life situations. Please read each scenario carefully and **imagine yourself in that situation**. Then, rate your stress level on the scale provided by **circling the appropriate number**. Generally, you can identify that you are experiencing stress if you feel nervous, uncomfortable and/or anxious. Please do not spend too much time on any one item: **your initial "gut" response** is important.

For each of the following scenarios: **RATE YOUR STRESS LEVEL**

1. At 35, you, your spouse and family are getting along well. You have moved to a new job and your boss really seems to like you. He is demanding that you work overtime on a regular basis and this eats into your weekends.

1	2	3	4	5
very low	low	moderate	high	very high

2. You have been in a love relationship for 2 years. You and your mate get along very well. You have decided to get married. You have saved for a year and the wedding is tomorrow afternoon. You are thinking about tomorrow, hoping everything goes well.

1	2	3	4	5
very low	low	moderate	high	very high

3. You have been married for 7 years. Lately, you and your spouse have been arguing a great deal. Together you decide on a divorce. Your spouse is being very difficult, arguing over every possession. You are not very happy with this situation. On the other hand, you are pleased with your job situation: you are very job secure.

1	2	3	4	5
very low	low	moderate	high	very high

4. Education is important to you, so you decide to go to college even though your family cannot pay for you. You enjoy your classes but they are very demanding. Since you work part-time and you are in school full-time, sometimes you feel pushed to the limit. The only relief is your emotionally supportive family.

1	2	3	4	5
very low	low	moderate	high	very high

5. You have been working in the same job for 4 years. You are happy with this job. Unfortunately, due to budget cuts, you are laid off. You have a family to support and you are concerned about finding another job. Your spouse and children love you and support whatever you do.

1	2	3	4	5
very low	low	moderate	high	very high

6. You have been looking for a new apartment for about 6 months. Nothing seems to be the right place. Today you found the apartment of your dreams. You feel so excited. The only problem is that you must make the move in the next 2 days.

1	2	3	4	5
very low	low	moderate	high	very high

7. You and your uncle have always been very close. You meet for dinner regularly and he has always been like a father to you. He has recently been diagnosed to be terminally ill. Your family understands, however they, too, require attention. You feel torn between two loyalties.

1	2	3	4	5
very low	low	moderate	high	very high

8. As a child you always wanted to have children of your own. Now as an adult, you and your spouse have 3 kids. They are all at the toddler age. You love your children and they demand a great deal of time and energy. This is not easy for a person working full time.

1	2	3	4	5
very low	low	moderate	high	very high

9. You are a hard worker. You have been a candidate for a promotion for 6 months. You proved yourself and got the promotion. You and your spouse are delighted. Now you are concerned: more responsibility means more time demands.

1	2	3	4	5
very low	low	moderate	high	very high

10. This is just not your morning. The alarm did not ring, the shower water was cold, the cat vomited in the bed and the subway was so crowded that you were pushed and shoved the entire ride to work.

1	2	3	4	5
very low	low	moderate	high	very high

11. You have been working for the same 2 people for the last year. Overall, you like your job but, sometimes, it can be pressured. Today, one boss asked you to complete a rather complex report by 5 p.m. Your other boss had already told you to complete his report by 3 p.m.

1	2	3	4	5
very low	low	moderate	high	very high

12. From time to time you attend training sessions at work. You have enjoyed them in the past. At this training session, the instructor is arrogant and confusing.

1	2	3	4	5
very low	low	moderate	high	very high

13. Around the office you and your boss get along well. However, when she gives you a job to do she is usually unclear about what she really wants. In the past you have spoken with her about this problem but it did no good.

1	2	3	4	5
very low	low	moderate	high	very high

14. You have been working for the same agency for 5 years. You enjoy your work very much. It allows you freedom and offers challenges. One of your clients claims you made a huge error in his calculations. He is threatening to sue your company.

1	2	3	4	5
very low	low	moderate	high	very high

15. You are the kind of person that is rarely ill. You never get common colds or the flu. On a visit to the doctor recently, he noticed some minor heart problem. He said he does not know exactly what it means and he scheduled you for more tests.

1	2	3	4	5
very low	low	moderate	high	very high

16. You have been in college for 3 years. You have worked hard and made the dean's honor list. This semester you are taking 3 tough classes. You walk into your psychology class today to discover you are having a test. It was announced last week when you were out sick. You have not studied for this test but you feel comfortable with the subject.

1	2	3	4	5
very low	low	moderate	high	very high

17. People have always described you as a punctual person. You take pride in doing things the right way. Your supportive family and your spouse depend on you. Today, you received a letter from the IRS indicating you owe $12,000 in back taxes.

1	2	3	4	5
very low	low	moderate	high	very high

18. At age 30, you and your spouse are financially successful. You both have secure jobs. Today you discovered you are having a baby.

1	2	3	4	5
very low	low	moderate	high	very high

19. People have always considered you to be very marketable. Specifically, you have never had trouble finding or keeping a job. You have been working for VLG Agency, an advertising firm, for 5 years. You enjoy a personal friendship with your boss. Recently, a new co-worker was hired. She is spreading vicious rumors about you. Your boss is beginning to believe her.

1	2	3	4	5
very low	low	moderate	high	very high

20. You have been working in the same position for 5 years. Your boss and your co-workers respect you. Last week a new co-worker was hired. It seems he has less experience and less education than you but he is getting the same pay. Your boss thinks he is great.

1	2	3	4	5
very low	low	moderate	high	very high

21. You are recently married. You really enjoy your new life. Your mother-in-law calls constantly to say you do everything wrong.

1	2	3	4	5
very low	low	moderate	high	very high

22. You have always been an ambitious person. You have a full time job. You have young children and you are enrolled in night school.

1	2	3	4	5
very low	low	moderate	high	very high

23. Your daughter is about to perform in her first school play. She is 9. Your job requires that you make a business trip out of town that same day. It might mean a $5,000 raise in your pay.

1	2	3	4	5
very low	low	moderate	high	very high

24. You have been in a love relationship for the last 3 years. You are planning to get married. Today you found out that your spouse-to-be has secretly been dating someone else.

1	2	3	4	5
very low	low	moderate	high	very high

25. You are in school full-time, you work full-time and you have two children. Today you found out that your four year-old-child has cancer.

1	2	3	4	5
very low	low	moderate	high	very high

26. You are single. You have not dated much. You have been more interested in your education. A new co-worker is hired at your job who seems interested in dating you. You think this is great.

1	2	3	4	5
very low	low	moderate	high	very high

27. Your boss thinks the world of you. That is why he just gave you the most important client account in the company.

1	2	3	4	5
very low	low	moderate	high	very high

28. You are unemployed. You have been struggling to find a job for over a year. You are concerned about money. Today, your old company called you with a job offer as Vice President.

1	2	3	4	5
very low	low	moderate	high	very high

29. You are a single parent. You have a three-year-old child. Life has not been easy for you over the years. This year you found a steady job and you found child-care for the kid.

1	2	3	4	5
very low	low	moderate	high	very high

30. Your parents did not have much money when you were young. You have been working since age 17. Therefore, you never had an opportunity to go to college. Now your job requires that you go back to school. At age 37 you wonder if you have the time or if you have the money to go back to school. Even more, you wonder if this is what you really want to do.

1	2	3	4	5
very low	low	moderate	high	very high

APPENDIX 2

Seat # _____

THE FOLLOWING QUESTIONNAIRE IS NOT SPONSORED BY THE CITY OF NEW YORK. COMPLETION OF THIS QUESTIONNAIRE WILL NOT AFFECT YOUR TYPING TEST SCORE OR YOUR CHANCE OF GETTING A JOB IN ANY WAY. COMPLETING THIS QUESTIONNAIRE IS VOLUNTARY AND YOUR ANSWERS WILL REMAIN CONFIDENTIAL.

RESEARCH QUESTIONNAIRE

This questionnaire is part of research being conducted for completion of a Ph.D. dissertation at the City University of New York.

Here are just a few questions about the typing test you just finished. Read the questions carefully and **give your honest opinion.**

INSTRUCTIONS

Answer each question by **circling a number between 1 and 7** that best describes **your personal reaction.** Your answers will remain **anonymous.** Please **do not put your name** or **social security number** anywhere on this questionnaire. However, for research purposes, please **write your seat number** in the upper right corner of this questionnaire

1. How much mental pressure, strain or nervousness did you experience **today** during the time you were **actually taking the test**?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

2. How much mental pressure, strain or nervousness did you experience **one-half hour before** taking the typing test?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

3. How much time did you spend **thinking about** this typing test **in the past few weeks**?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

4. How much mental pressure, strain or nervousness did you **experience** when you thought about the typing test **during the past few weeks**?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

5. **How important** to you **is the outcome** of this typing test?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

6. Are you currently employed? ❑ Yes ❑ No

7. If you could predict your test result, **how accurate** do you think you would be?

1	2	3	4	5	6	7
VERY INACCURATE						VERY ACCURATE

8. Do you think you passed this typing test? ❑ Yes ❑ No

9. To what extent will **passing** this test **improve** job opportunities over the next five years?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

10. To what extent will **failing** this test **damage** job opportunities over the next five years?

1	2	3	4	5	6	7
VERY LITTLE						A GREAT DEAL

11. If you should **not** get this job, what will you do?

12. How can this testing be made a **more pleasant** experience for you?

APPENDIX 3

RESEARCH SURVEY

The purpose of this survey is to find out your reactions to a variety of statements about life and work. The last page of this survey contains questions about you -- demographics and personal history items.

This survey is **anonymous** and your replies are **confidential**. The background information will be used for statistical analysis only, so that the possible influences of background variables may be examined. Your social security number will only be used to match your responses to this survey with your responses to the survey given to you after the typing test.

There are no right or wrong answers to this survey. Please read each item carefully and **answer every item**. Do not discuss your responses beforehand with friends or family. If you wish to receive a summary of the overall results of this study, please enclose a self-addressed stamped envelope

DO NOT COMPLETE THIS SURVEY UNTIL AT LEAST TWO (2) DAYS AFTER TAKING THE TYPING TEST!

Date Survey was completed: _____

☞

Listed below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agrement with each item by **circling the appropriate category:**

1	2	3	4	5	6	7
strongly disagree	disagree	slightly disagree	neither agree nor disagree	slightly agree	agree	strongly agree

1. In most ways my life is close to ideal.

1 2 3 4 5 6 7

2. The conditions of my life are excellent.

1 2 3 4 5 6 7

3. I am satisfied with my life.

1 2 3 4 5 6 7

4. So far I have gotten the important things in life.

1 2 3 4 5 6 7

5. If I could live my life over, I would change almost nothing.

1 2 3 4 5 6 7

Listed below are fifteen statements that may or may not describe how you feel about work. Indicate the extent to which you agree or disagree with each statement by **circling the appropriate number** under each statement:

1	2	3	4	5
strongly disagree	disagree	not sure	agree	strongly agree

1. The most important things that happen to me involve work.

1 2 3 4 5

2. I have other activities more important than my work.

1 2 3 4 5

3. Most of my real interests are centered outside of work.

1 2 3 4 5

4. I am very much involved personally with work.

1 2 3 4 5

5. Most things in life are more important than work.

1 2 3 4 5

6. I used to care more about work, but now other things are more important.

1 2 3 4 5

7. I work because I have to, not because I really want to.

1 2 3 4 5

8. I would probably keep working even if I didn't need the money.

1 2 3 4 5

9. Work is one of the most important aspects of my life.

1 2 3 4 5

10. I would be lost without work.

1 2 3 4 5

11. I used to be more concerned with other activities, but now work is more important.

1 2 3 4 5

12. Most of my time and energy is willingly devoted to work.

1 2 3 4 5

13. Work is merely a means to other more important ends.

1 2 3 4 5

14. The best description of who I am would be based on the job I have.

1 2 3 4 5

15. Non-work activities occupy a great deal of my time and energy.

1 2 3 4 5

Listed below are 25 statements a person might use to describe him/herself. **If a statement is true about you**, or more true than not, **put a "T" next to that item.** If a statement is **false**, or at least more false than true, **mark an "F"** next to that item.

Please answer **every statement**, even if you are not completely sure of the answer. Read each statement carefully, but don't spend too much time deciding on the answer.

_____ 1. I often find myself worrying about something.

_____ 2. My feelings are hurt rather easily.

_____ 3. It is easy for me to become enthusiastic about things I am doing.

_____ 4. Often I get irritated at little annoyances.

_____ 5. I often feel happy and satisfied for no particular reason.

_____ 6. I suffer from nervousness.

_____ 7. I live a very interesting life.

_____ 8. My mood often goes up and down.

_____ 9. Every day I do some things that are fun.

_____ 10. I sometimes feel "just miserable" for no good reason.

_____ 11. Occasionally I experience strong emotions -- anxiety, anger -- without really knowing what causes them.

_____ 12. I usually find ways to liven up my day.

_____ 13. I am easily startled by things that happen unexpectedly.

_____ 14. I sometimes get myself into a state of tension and turmoil as I think of the day's events.

_____ 15. Most days I have moments of real fun or joy.

_____ 16. I often feel sort of lucky for no special reason.

_____ 17. I often loose sleep over my worries.

_____ 18. Minor setbacks sometimes irritate me too much.

_____ 19. In my spare time I usually find something interesting to do.

_____ 20. There are days when I'm "on edge" all of the time.

_____ 21. For me life is a great adventure.

_____ 22. I am too sensitive for my own good.

_____ 23. Every day interesting and exciting things happen to me.

_____ 24. I sometimes change from happy to sad, or vice versa, without good reason.

_____ 25. I always seem to have something pleasant to look forward to.

For each of the following scenarios: **RATE YOUR STRESS LEVEL**

1. At 35, you, your spouse and family are getting along well. You have moved to a new job and your boss really seems to like you. He is demanding that you work overtime on a regular basis and this eats into your weekends.

1	2	3	4	5
very low	low	moderate	high	very high

2. You have been married for 7 years. Lately, you and your spouse have been arguing a great deal. Together you decide on a divorce. Your spouse is being very difficult, arguing over every possession. You are not very happy with this situation. On the other hand, you are pleased with your job situation: you are very job secure.

1	2	3	4	5
very low	low	moderate	high	very high

3. Education is important to you, so you decide to go to college even though your family cannot pay for you. You enjoy your classes but they are very demanding. Since you work part-time and you are in school full-time, sometimes you feel pushed to the limit. The only relief is your emotionally supportive family.

1	2	3	4	5
very low	low	moderate	high	very high

4. When you awoke, it seemed like a good morning. Then you discovered you left your brand new $200.00 pair of glasses on the train and you need them for an early morning meeting.

1	2	3	4	5
very low	low	moderate	high	very high

5. You have been looking for a new apartment for about 6 months. Nothing seems to be the right place. Today you found the apartment of your dreams. You feel so excited. The only problem is that you must make the move in the next 2 days.

1	2	3	4	5
very low	low	moderate	high	very high

6. You and your uncle have always been very close. You meet for dinner regularly and he has always been like a father to you. He has recently been diagnosed to be terminally ill. Your family understands, however they, too, require attention. You feel torn between two loyalties.

1	2	3	4	5
very low	low	moderate	high	very high

7. You had bad dreams all night and awoke tired and crabby. Then when you got to work you realized you left your keys at home.

1	2	3	4	5
very low	low	moderate	high	very high

8. As a child you always wanted to have children of your own. Now as an adult you and your spouse have 3 kids. They are all at the toddler age. You love your children and they demand a great deal of time and energy. This is not easy for a person working full time.

1	2	3	4	5
very low	low	moderate	high	very high

9. You are a hard worker. You have been a candidate for a promotion for 6 months. You proved yourself and got the promotion. You and your spouse are delighted. Now you are concerned: more responsibility means more time demands.

1	2	3	4	5
very low	low	moderate	high	very high

10. This is just not your morning. The alarm did not ring, the shower water was cold, the cat vomited in the bed and the subway was so crowded that you were pushed and shoved the entire ride to work.

1	2	3	4	5
very low	low	moderate	high	very high

11. You have been working for the same 2 people for the last year. Overall, you like your job but, sometimes, it can be pressured. Today, one boss asked you to complete a rather complex report by 5 p.m. Your other boss had already told you to complete his report by 3 p.m.

1	2	3	4	5
very low	low	moderate	high	very high

12. From time to time you attend training sessions at work. You have enjoyed them in the past. At this training session, the instructor is arrogant and confusing.

1	2	3	4	5
very low	low	moderate	high	very high

13. Around the office you and your boss get along well. However, when she gives you a job to do she is usually unclear about what she really wants. In the past you have spoken with her about this problem but it did no good.

1	2	3	4	5
very low	low	moderate	high	very high

☞

14. You had a pretty good day at work. However, it was a very rainy day and when you got home you discovered you left the windows open and your apartment was flooded.

1	2	3	4	5
very low	low	moderate	high	very high

15. You need new clothes badly. So, today you went shopping. Unfortunately, you discover that you gained weight and that you no longer fit into your usual size.

1	2	3	4	5
very low	low	moderate	high	very high

16. You are the kind of person that is rarely ill. You never get common colds or the flu. On a visit to the doctor recently, he noticed some minor heart problem. He said he does not know exactly what it means and he scheduled you for more tests.

1	2	3	4	5
very low	low	moderate	high	very high

17. You have been in college for 3 years. You have worked hard and made the dean's honor list. This semester you are taking 3 tough classes. You walk into your psychology class today to discover you are having a test. It was announced last week when you were out sick. You have not studied for this test but you feel comfortable with the subject.

1	2	3	4	5
very low	low	moderate	high	very high

18. People have always described you as a punctual person. You take pride in doing things the right way. Your supportive family and your spouse depend on you. Today, you received a letter from the IRS indicating you owe $12,000 in back taxes.

1	2	3	4	5
very low	low	moderate	high	very high

19. At age 30, you and your spouse are financially successful. You both have secure jobs. Today you discovered you are having a baby.

1	2	3	4	5
very low	low	moderate	high	very high

20. People have always considered you to be very marketable. Specifically, you have never had trouble finding or keeping a job. You have been working for VLG Agency, an advertising firm, for 5 years. You enjoy a personal friendship with your boss. Recently, a new co-worker was hired. She is spreading vicious rumors about you. Your boss is beginning to believe her.

1	2	3	4	5
very low	low	moderate	high	very high

21. Everything seems to have gone wrong at work today. You forgot about a meeting, one of your reports was late and your secretary quit.

1	2	3	4	5
very low	low	moderate	high	very high

22. You are a single parent. You have a three-year-old child. Life has not been easy for you over the years. This year you found a steady job and you found child-care for the kid.

1	2	3	4	5
very low	low	moderate	high	very high

23. You have been working in the same position for 5 years. Your boss and your co-workers respect you. Last week a new co-worker was hired. It seems he has less experience and less education than you but he is getting the same pay. Your boss thinks he is great.

1	2	3	4	5
very low	low	moderate	high	very high

24. You are recently married. You really enjoy your new life. Your mother-in-law calls constantly to say you do everything wrong.

1	2	3	4	5
very low	low	moderate	high	very high

25. You have always been an ambitious person. You have a full time job. You have young children and you are enrolled in night school.

1	2	3	4	5
very low	low	moderate	high	very high

26. Your daughter is about to perform in her first school play. She is 9. Your job requires that you make a business trip out of town that same day. It might mean a $5,000 raise in your pay.

1	2	3	4	5
very low	low	moderate	high	very high

27. You are single. You have not dated much. You have been more interested in your education. A new co-worker is hired at your job who seems interested in dating you. You think this is great.

1	2	3	4	5
very low	low	moderate	high	very high

☞

28. Your boss thinks the world of you. That is why he just gave you the most important client account in the company.

1	2	3	4	5
very low	low	moderate	high	very high

29. You are unemployed. You have been struggling to find a job for over a year. You are concerned about money. Today, your old company called you with a job offer as Vice President.

1	2	3	4	5
very low	low	moderate	high	very high

30. Your parents did not have much money when you were young. You have been working since age 17. Therefore, you never had an opportunity to go to college. Now your job requires that you go back to school. At age 37 you wonder if you have the time or if you have the money to go back to school. Even more, you wonder if this is what you really want to do.

1	2	3	4	5
very low	low	moderate	high	very high

☞

Listed below are several common symptoms or bodily sensations that most people have experienced at one time or the another. **Write the letter that signifies how frequently** you experience that symptom, on the space provided.

A	B	C	D	E
have never or almost never experienced the symptom	less than 3 or 4 times per year	every month or so	every week or so	more than once every week

_____ 1. Eyes water

_____ 2. Itching or painful eyes

_____ 3. Ringing in ears

_____ 4. Temporary deafness or hard of hearing

_____ 5. Lump in throat

_____ 6. Choking sensations

_____ 7. Sneezing spells

_____ 8. Running nose

_____ 9. Congested nose

_____ 10. Bleeding nose

_____ 11. Asthma or wheezing

_____ 12. Coughing

_____ 13. Out of breath

_____ 14. Swollen ankles

_____ 15. Chest pains

_____ 16. Racing heart

_____ 17. Cold hands or feet even in hot weather

_____ 18. Leg cramps

_____ 19. Insomnia

_____ 20. Toothaches

_____ 21. Upset stomach

_____ 22. Indigestion

_____ 23. Heartburn

_____ 24. Severe pains or cramps in stomach

_____ 25. Diarrhea

_____ 26. Constipation

_____ 27. Hemorrhoids

_____ 28. Swollen joints

_____ 29. Stiff muscles

_____ 30. Back pains

_____ 31. Sensitive or tender skin

_____ 32. Face flushes

_____ 33. Severe itching

_____ 34. Skin breaks out in rash

_____ 35. Acne or pimples on face

_____ 36. Acne or pimples other than face

_____ 37. Boils

_____ 38. Sweat even in cold weather

_____ 39. Strong reactions to insect bites

_____ 40. Headaches

_____ 41. Sensation of pressure in head

_____ 42. Hot flashes

_____ 43. Chills

_____ 44. Dizziness

_____ 45. Feel faint

_____ 46. Numbness or tingling in any part of body

_____ 47. Twitching of eyelid

_____ 48. Twitching other than eyelid

_____ 49. Hands tremble or shake

_____ 50. Stiff joints

_____ 51. Sore muscles

_____ 52. Sore throat

_____ 53. Sunburn

_____ 54. Nausea

BACKGROUND INFORMATION

1. Indicate whether you are: ❑ female ❑ male

2. What is your age? _____ years

3. Indicate whether you are:

❑ White
❑ Black
❑ Hispanic
❑ Asian
❑ Native American
❑ Other (please specify) _____

4. What is your present marital status?

❑ Single, never married
❑ Married
❑ Divorced or separated
❑ Widowded

5. For how many children do you currently provide financial support, in whole or part? _____

6. Indicate the highest level of education attained:

❑ Some Grade School
❑ Grade School Graduate
❑ Some High School
❑ High School Graduate
❑ Some College
❑ College Graduate
❑ Some Post-Graduate Training
❑ Graduate Degree

7. Are you currently employed?
❑ no ❑ yes (part time) ❑ yes (full time)

8. What is your current job title? _____

9. About how long have you been in this job? _____ years

10. If you are not currently employed, what was your most recent job title?

_____

11. Your social security number is: _____

ANXIETY BEHAVIORS											
seat	chair swapping	cold hands	fidgets	verbalizes	questions	paper problem	complains	changes typewriter	machine problems	departs	other
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											

Date:_____ Time:_____ Session:_____ N:_____

APPENDIX 5

TABLE 17

ITEM-TOTAL STATISTICS FOR PROPENSITY TO PERCEIVE STRESS

ITEM NUMBER	CORRECTED ITEM-TOTAL	alpha if item deleted
stress1	.3676	.8850
stress2	.2467	.8873
stress3	.3355	.8856
stress4	.4384	.8836
stress5	.4487	.8834
stress6	.4106	.8842
stress7	.5047	.8822
stress8	.4703	.8830
stress9	.3990	.8844
stress10	.5775	.8808
stress11	.5879	.8808
stress12	.4714	.8830
stress13	.4677	.8832
stress14	.5017	.8822
stress15	.4921	.8825
stress16	.4532	.8833
stress17	.4238	.8839
stress18	.5568	.8810
stress19	.2637	.8879
stress20	.4647	.8831
stress21	.5318	.8818
stress22	.1508	.8905
stress23	.4848	.8826
stress24	.5321	.8815
stress25	.3258	.8859
stress26	.4739	.8829
stress27	.4366	.8837
stress28	.3594	.8854
stress29	.3525	.8854
stress30	.4932	.8826

APPENDIX 6

TABLE 18

FACTOR MATRIX FOR PROPENSITY TO PERCEIVE STRESS

VARIABLE	FACTOR 1
PPS4	.754575
PPS6	.75229
PPS3	.73320
PPS1	.73083
PPS2	.72653
PPS5	.69866
PPS7	.67308
PPS9	.64500
PPS8	.64079
PPS10	.60210

TABLE 19

FINAL STATISTICS FOR PROPENSITY TO PERCEIVE STRESS MODEL

VARIABLE	COMMUNALITY	FACTOR	EIGENVALUE	% VARIANCE
PPS1	.53411	1	4.86546	48.7
PPS2	.52784			
PPS3	.53759			
PPS4	.56964			
PPS5	.48813			
PPS6	.56594			
PPS7	.45304			
PPS8	.41061			
PPS9	.41603			
PPS10	.36252			

Table 20

Comparison of the propensity to perceive stress three models factor solutions

MODEL	χ^2	degrees of freedom	% of variance accounted for	% of significant residuals	lowest factor loading
1. 10-items (grouped) *1 factor*	91.7	35	48.7%	20%	.6
2. 30-items *1 factor*	1480.3	405	22.7%	50%	.01
3. 30-items *1 factor*	795.2	376	31.0%	28%	.18

Note: all χ^2 are significant; for model 3, oblique rotation was used

APPENDIX 8

Table 21

The propensity to perceive stress one factor solution factor structure matrix

Variable	Factor loading
PPS18	.67865
PPS10	.67522
PPS21	.67301
PPS11	.61627
PPS24	.59869
PPS7	.59597
PPS14	.58786
PPS20	.57052
PPS23	.55413
PPS16	.54621
PPS4	.54480
PPS26	.50435
PPS30	.49869
PPS15	.49185
PPS12	.49008
PPS13	.48703
PPS6	.47185
PPS8	.47168
PPS5	.44882
PPS17	.39727
PPS1	.38452
PPS27	.34766
PPS9	.31999
PPS29	.31320
PPS3	.29415
PPS28	.24087
PPS25	.23972
PPS2	.22106
PPS19	.14040
PPS22	.01114

Table 22

The propensity to perceive stress one factor model final statistics

Variable	Communality	Factor	Eigenvalue	Cumulative %
PPS1	.14785	1	6.80277	22.7
PPS2	.04887			
PPS3	.08653			
PPS4	.29681			
PPS5	.20144			
PPS6	.22264			
PPS7	.35519			
PPS8	.22249			
PPS9	.10239			
PPS10	.45592			
PPS11	.37979			
PPS12	.24018			
PPS13	.23719			
PPS14	.34558			
PPS15	.24192			
PPS16	.29834			
PPS17	.15782			
PPS18	.46057			
PPS19	.01971			
PPS20	.32549			
PPS21	.45294			
PPS22	.00012			
PPS23	.30706			
PPS24	.35843			
PPS25	.05747			
PPS26	.25437			
PPS27	.12086			
PPS28	.05802			
PPS29	.09810			
PPS30	.24869			

APPENDIX 9

Table 23

The propensity to perceive stress two factor solution - oblique rotated structure matrix

Variable	Factor 1	Factor 2
PPS21	.72999	.02441
PPS18	.71147	.11488
PPS10	.68396	.19150
PPS7	.60987	.12988
PPS14	.59764	.15311
PPS24	.59762	.22173
PPS20	.59388	.10737
PPS11	.59116	.27843
PPS4	.58391	.01565
PPS16	.57002	.10327
PPS23	.55837	.17376
PPS26	.48998	.26910
PPS6	.48177	.10648
PPS30	.46907	.36051
PPS13	.46445	.30074
PPS12	.45930	.34420
PPS15	.45712	.37218
PPS8	.44139	.34095
PPS5	.42217	.30431
PPS1	.36867	.22007
PPS22	-.10567	.68176
PPS28	.15578	.64263
PPS19	.04682	.61714
PPS27	.27901	.59203
PPS9	.24573	.56144
PPS25	.17034	.51513
PPS17	.35302	.43009
PPS29	.27139	.39707
PPS3	.25310	.34266
PPS2	.19449	.22408

Table 24

The propensity to perceive stress two factor solution — final statistics

Variable	Communality	Factor	Eigenvalue	Cumulative % Variance
PPS1	.14861	1	6.86244	22.9
PPS2	.06771	2	2.65953	31.7
PPS3	.14166			
PPS4	.37029			
PPS5	.21206			
PPS6	.23396			
PPS7	.37550			
PPS8	.24158			
PPS9	.32124			
PPS10	.46816			
PPS11	.39251			
PPS12	.25670			
PPS13	.24346			
PPS14	.35815			
PPS15	.26848			
PPS16	.33052			
PPS17	.23905			
PPS18	.51787			
PPS19	.40313			
PPS20	.35880			
PPS21	.57686			
PPS22	.57381			
PPS23	.031178			
PPS24	.35881			
PPS25	.26554			
PPS26	.25574			
PPS27	.36106			
PPS28	.41482			
PPS29	.18244			
PPS30	.27195			

APPENDIX 10

TABLE 25

ROTATED OBLIQUE FACTOR MATRIX

VARIABLE	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
Positive Affectivity	.99950	.00092	-.00009	-.00006
Life Satisfaction	.33712	-.16209	-.04783	.18306
P.I.L.L.	-.23544	.69434	.07213	.21266
Negative Affectivity	-.33999	.55900	-.07897	-.06093
P.P.S.	-.12027	.43245	.04515	-.32806
Anxiety Errors	.02482	.10485	.06251	.09295
Test Anxiety	.04972	.14954	.42460	-.04400
Alienation/Involvement	.11878	-.29864	.38540	.15233
Anxiety Behaviors	.03874	-.02262	.32709	-.20041

TABLE 26

Final Statistics

Variable	Communality	Factor	Eigenvalue	% Variance
P.P.S.	.31114	1	1.31677	14.6
P.I.L.L.	.58794	2	1.13093	27.2
Alienation/Involvement	.27503	3	.45547	32.3
Life Satisfaction	.17571	4	.26401	35.2
Negative Affectivity	.43801			
Positive Affectivity	.99900			
Test Anxiety	.20699			
Anxiety Behaviors	.14915			
Anxiety Errors	.02415			

TABLE 27

RESIDUALS BETWEEN OBSERVED AND REPRODUCED CORRELATION MATRIX

VARIABLES	P.P.S.	P.I.L.L.	ALIENATION / INVOLVEMENT	LIFE SATISFACTION	NEGATIVE AFFECTIVITY	POSITIVE AFFECTIVITY	TEST ANXIETY	ANXIETY BEHAVIORS
P.P.S.		-.02248	-.04911	-.04544	-.00500	.00001	.00036	.04527
P.I.L.L.			.01674	.01944	.01481	-.00000	.01400	-.02834
ALIENATION / INVOLVEMENT				.05464	.01547	-.00001	.01202	.00669
LIFE SATISFACTION					.01951	.00001	.00900	-.05957
NEGATIVE AFFECTIVITY						-.00000	-.00539	-.00380
POSITIVE AFFECTIVITY							-.00000	.00002
TEST ANXIETY								-.01589
ANXIETY BEHAVIORS								

APPENDIX 12

Table 28

Comparison of one and two factor solutions for negative affectivity and the propensity to perceive stress factor analysis

Model	χ^2	degrees of freedom	% variance accounted for	% significant residuals	lowest factor loading
1. 2 factors	48.8	19	58.3%	8%	.72
2. 1 factor	482.9	27	37.7%	50%	.28

Note: the 2 factor model used oblique rotation

APPENDIX 13

TABLE 29		
OBLIQUE ROTATED FACTOR STRUCTURE MATRIX FOR PPS AND NEGATIVE AFFECTIVITY		
VARIABLES	FACTOR 1	FACTOR 2
PPS1	.82157	.2591
PPS2	.79021	.32303
PPS3	.77244	.23466
PPS4	.76655	.26469
PPS5	.70174	.27668
NA1	.26121	.77964
NA2	.30989	.76348
NA3	.28459	.73752
NA4	.20924	.72191

TABLE 30				
FINAL STATISTICS FOR PPS AND NEGATIVE AFFECTIVITY				
VARIABLE	COMMUNALITY	FACTOR	EIGENVALUE	% VARIANCE
NA4	.52331	1	3.60538	40.1
NA3	.54473	2	1.63767	58.3
NA2	.58496			
NA1	.60800			
PPS5	.49353			
PPS4	.62688			
PPS3	.67589			
PPS2	.59811			
PPS1	.58762			

Table 31

The propensity to perceive stress path model fit indices

Model	χ^2	degrees of freedom	NFI	GFI	RMSR
1. NULL	270.22	35	—	.850	.141
2. Figure 6 (A-I & PILL lead to LS)	135.51	16	.498	.936	.094
3. Figure 7 (Bidirectional paths)	----------	DID	NOT	CONVERGE	----------
4. Figure 8 (No na/pa)	165.34	14	.388	.924	.116
5. Figure 9 (Proposed model)	126.99	12	.530	.939	.089
6. Figure 10 (NA/PA to outcomes)	10.51*	9	.962	.994	.024

* χ^2 was not significant
N = 344 for all models

REFERENCES

Abush, R., & Burkhead, E.J. (1984). Job stress in midlife working women: Relationship among personality type, job characteristics and job tension. Journal of Counseling Psychology, 31(1), 36-44.

Bagozzi, R.P. (1978). Salesforce performance and satisfaction as a function of individual differences, interpersonal, and situational factors. Journal of Marketing Research, 15, 517-531.

Baker, G.W., & Chapman, D.W. (Eds.). (1962). Man and society in disaster. New York: Basic Books.

Beehr, T.A., & Franz, T.M. (1987). The current debate about the meaning of job stress. Journal of Organizational Behavior, 8(2), 10-20.

Beehr, T.A., & Newman, J.E. (1978). Job stress, employee health and organizational effectiveness: A facet analysis, model and literature review. Personnel Psychology, 31, 665-699.

Beehr, T.A., Walsh, J.T., & Taber, T.D. (1976). Relationship of stress to individually and organizationally valued states: Higher order needs as a moderator. Journal of Applied Psychology, 61, 41-47.

Bentler, B.M., & Bonett, D.G. (1980). Significance tests and the goodness of fit in the analysis of covariance structures. Psychological Bulletin, 88(3), 588-606.

Berkowitz, A.D., & Perkins, H.W. (1984). Stress among farm women: Work and family as interacting systems. Journal of Marriage and the Family, 161-166.

Bhagat, R.S., McQuaid, S.J., Lindholm, H., & Segovis, J. (1985). Total life stress: A multimethod validation of the construct and its effects on organizationally valued outcomes and withdrawal behaviors. Journal of Applied Psychology, 70(1), 202-214.

Billings, A.G., & Moos, R.H. (1982). Work stress and the stress suffering roles of work and family resources. Journal of Occupational Behavior, 3, 215-232.

Brief, A.P., & Atieh, J.M. (1987). Studying job stress: Are we making mountains out of molehills? Journal of Occupational Behavior, 8(2), 115-126.

Brief, A.P., Burke, M.J., George, J.M., Robinson, B.S., & Webster, J. (1988). Should negative affectivity remain an unmeasured variable in the study of job stress? Journal of Applied Psychology, 73, 529-535.

Brodsky, C.M. (1984). Long term work stress. Psychosomatics, 25(5), 361-368.

Burke, R.J. (1987). The present and future status of stress research. Journal of Organizational Behavior, 8(2) 10-20.

Byrne, B.M. (1989). A primer of LISREL basic applications and programming for confirmatory factor analytic models. New York: Springer-Verlag.

Caplan, R.D., Cobb, S., & French, J.R.P., Jr., (1975). Relationships of cassation of smoking with job stress, personality, and social support. Journal of Applied Psychology, 60, 211-219.

Caplan, R.D., & Jones, K.W. (1975). Effects of workload, role ambiguity and Type A personality on anxiety, depression, and heart rate. Journal of Applied Psychology, 60, 713-719.

Chan, K.B. (1977). Individual differences in reactions to stress and their personality and situational determinants. Social Science and Medicine, 11, 89-103.

Chemers, M.M., Hays, R.B., Rhodewalt, F., & Wysocki, J. (1985). A person-environment analysis of job stress: A contingency model explanation. Journal of Personality and Social Psychology, 49(3), 628-635.

Cohen, L.H. (1988). Life Events and Psychological Functioning. California: Sage Publications.

Conway, T.L., Vickers, R.R. Jr., Ward, H.W., & Rahe, R.H. (1981). Occupational stress and variation in cigarette, coffee and alcohol consumption. Journal of Health and Social Behavior, 22(2), 155-165.

Cooper, C.L., & Payne, R. (1988). Causes, Coping and Consequences of Stress at Work. New York: John Wiley & Sons.

Cooper, C.L.,& Marshall, J. (1976). Occupational sources of stress: A review of the literature relating to coronary heart disease and mental ill health. Journal of Occupational Psychology, 49, 11-28.

Cooper, C.L. & Smith, M.J. (1985). Job Stress and Blue Collar Work. New York: John Wiley & Sons.

Cosper, R. (1979). Drinking as conformity: A critique of sociological literature on occupational differences in drinking. Journal of Studies on Alcohol, 4(9), 868-891.

Cottington, E.M., Matthews, K.A., Talbott, E., & Kuller, L.H. (1986). Occupational stress, suppressed anger and hypertension. Psychosomatic Medicine, 48(3-4), 249-260.

Dearborn, M.J., & Hastings, J.E. (1987). Type A personality as a mediator of stress and strain in employed women. Journal of Human Stress, 13(2), 53-60.

Decker, F. H. (1985). Socialization and interpersonal environment in nurses' affective reactions to work. Social Science and Medicine, 20(5). 499-509.

Dijkhuizen, N.V. (1974). Toward a sequential model of organizational stress. Organizational Stress, 19-34.

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

Durkheim, E. (1893). De la Division do Travail Social. Paris: F. Alcan.

Eden, D. (1982). Critical job events, acute stress and strain—A multiple interrupted time series. Organizational Behavior and Human Performance, 30, 312-329.

Eisner, D.A. (1984). Mental injury in workers compensation: An examination of job stress. American Journal of Forensic Psychology, 2(3), 101-111.

Fineman, S., & Payne, R. (1981). Role stress— methodological trap? Journal of Occupational Behavior, 2, 51-64.

Fisher, C.D. (1985). Social Support and adjustment to work: A longitudinal study. Journal of Management, 11(3), 39-53.

Ford, D.L., & Bagot, D.S. (1978). Correlates of job stress and satisfaction in minority professionals in organizations: An examination of personal and organizational factors. Group and Organizational Studies, 3(1), 30-41.

Ford, D.L. (1985). Facets of work support and employee work outcomes: An exploratory analysis. Journal of Management, 11(3), 5-20.

French, J.R.P., Rogers, W., & Cobb, S.S. (1974). A model of person-environment fit. In G.V. Coelho, D.A. Hamburgh, & J.E. Adams (Eds.). Coping and Adaptation. New York: Basic Books.

Freud, S. (1956). Collected Papers: Volumes I-!V, London: Hogarth Press & The institute of Psychoanalysis.

Gavin, J.F., & Axelrod, W.L. (1977). Managerial stress and strain in a mining organization. Journal of Vocational Behavior, 11, 66-74

Goldberg, R.J. (1983). Stress in the workplace: An integrated approach. New Directions for Mental Health Services, 20(Dec), 65-74.

Gore, S., & Mangione, T. (1983). Social roles, sex roles and psychological distress: Additive and interactive models of sex differences. Journal of Health and Social Behavior, 24, 300-312.

Gorsuch, R.L. (1983). Factor Analysis. New Jersey: Erlbaum.

Graf, F.A. (1986). The relationship between social support and occupational stress among police officers. Journal of Police Science and Administration, 14(3), 178-186.

Gummer, B. (1979). All that stresses does not strain: Job satisfaction, morale, and turnover, 3(4), 489-494.

Hackman, J.B., & Oldham, G.R. (1980). Work Redesign. Reading, Mass: Addision Wesley.

Hamel, K., & Bracken, D. (1986). Factor structure of the job stress questionnaire in three occupational groups. Educational and Psychological Measurement, 46(3), 777-786.

Handy, C. (1978). The family: Help or hindrance? In C.L. Cooper & R. Payne (Eds.). Stress at Work. New York: John Wiley and Sons.

Heine, C.A. (1986). Burnout among nursing home personnel. Journal of Gerontological Nursing, 12(3), 14-18.

Hembree, R. (1988). Correlates, causes, effects and treatment of test anxiety. Review of Educational Research, 58(1), 47-77.

Hendrix, W.H., Ovalle, N. A., & Troxler, R.G. (1985). Behavioral and physiological Consequences of stress and its antecedent factors. Journal of Applied Psychology, 70(1), 188-201.

Hiller, S. (1981). Stress, Strains and smoking. Nursing Mirror, 26-30.

Hoch, P.H., & Zubin, J. (Eds.). (1950). Anxiety. New York: Grune and Stratton.

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

Howard, J.H., Cunningham, D.A., & Rechnitzer, P.A. (1986). Personality (hardiness) as a moderator of job stress and coronary risk in Type A individuals: A longitudinal study. Journal of Behavioral Medicine, 9(3), 229-244.

Howard, J.H., Cunningham, D.A., & Rechnitzer, P.A. (1986). Role Ambiguity, Type A behavior and job satisfaction: Moderating effect on cardiovascular and biochemical responses associated with coronary risk. Journal of Applied Psychology, 71(1), 95-101.

Invancevich, J.M., & Ganster, D.C. (Eds.). (1987). Job Stress: From Theory to Suggestion. New York: The Haworth Press.

Ivancevich, J.M., Matteson, M.T., & Preston, C. (1982). Occupational stress, Type A behavior and physical well being. Academy of Management Journal, 25, 373-391.

Jackson, S., & Schuler, R. (1985). A meta—analysis and conceptual critique of research on role ambiguity and role conflict in work settings. Organizational Behavior and Human Decision Making Processes, 36, 16-78.

Jamal, M. (1984). Job stress and job performance controversy: An empirical assessment. Organizational Behavior and Human Performance, 33(1), 1-21.

Jamal, M. (1985). Relationship of job stress to job performance: A study of managers and blue collar workers. Human Relations, 38(5), 409-424.

Jayaratne, S., & Chess, W.A. (1984). The effects of emotional support on perceived job stress and strain. Journal of Applied Behavioral Science, 20(2), 141-153.

Jick, T.D., & Mitz, L.F. (1985). Sex differences in work stress. Academy of Management Review, 10(3), 408-420.

Kahn, R.L., Wolfe, D.M., Quinn, R.P., Snoek, J.D., & Rosenthal, R.A. (1964). Organizational Stress: Studies in Role Conflict and Ambiguity. New York: John Wiley & Sons.

Kanner, A.D., Coyne, J.C., Schaefer, C., & Lazarus, R.S. (1981). Comparisons of two models of stress measurement: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine, 4, 1-39.

Karasek, R.A. Jr. (1979) Job demands, job decision latitude and mental strain: Implications for job redesign. Administrative Science Quarterly, 24, 285-308.

Kaufman, G.M., & Beehr, T.A. (1986). Interactions between job stressors and social support. Journal of Applied Psychology, 71(3), 522-526.

Kirjonen, J., & Hanninen, V. (1986). Getting a better job: Antecedents and effects. Human Relations, 39(6), 503-516.

Kabasa, S.C. (1979). Stressful life events, personality and health: An inquiry into hardiness. Journal of Personality and Social Psychology, 37, 1-11.

Lawerence, R.A. (1984). Police stress and personality factors: A conceptual model. Journal of Criminal Justice, 12(3), 247-263.

Lazarus, R.S., & Folkman, S. (1984). Stress, Appraisal and Coping. New York: Springer Verlag Publishing Company, Inc.

Lazarus, R.S., Delongis, A., Folkman,S., & Gruen, R. (1985). Stress and adaptational outcomes. The problem of confounded measures. American Psychologist, 40, 770-779.

Lazarus, R.S., & Erikson, C.W. (1952). Effects of failure stress upon skilled performance. Journal of Experimental Psychology, 43, 100-105.

Lefkowitz, J., Somers, M.J., & Weinberg, K. (1984). The role of need level or need salience as moderators of the relationship between need satisfaction and work alientaion-involvement. Journal of Vocational Behavior, 24, 142-158.

Lefkowitz, J., & Iorizzo, L. (1988). Gender differences in job attitudes and personological variables. ERIC/CAPS Resources in Education, Aug, ED291 986.

Levinson, H. (1978). A psychoanalytic view of occupational stress. Occupational Mental Health, 3(2), 2-13.

Lewin, K., Lippett, R., & White, R.K. (1939). Patterns of aggressive behavior in experimentally created social climates. Journal of Social Psychology, 10, 271-299.

Lindenthal, J.J., Myers, J.K., & Pepper, M.P. (1972). Smoking, psychological status and stress. Social Science and Medicine, 6, 583-591.

Lindquist, C.A., & Whitehead, J.T. (1986). Correctional officers as parole officers: An examination of a community supervision sanction. Criminal Justice and Behavior, 13(3), 122-192.

Litt, M.D., & Turk, D.S. (1985). Sources of stress and dissatisfaction in experienced high school teachers. Journal of Education Research, 78(3), 178-185.

McGrath, J.E. (1976). Stress and behavior in organizations. In M.D. Dunnette (Ed.). Handbook of Industrial and Organizational Psychology. Skokie, Ill: Rand McNally.

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

Marino, K.E., & White, S.E. (1985). Departmental structure, locus of control and job stress: The effect of a moderator. Journal of Applied Psychology, 70(4), 782-784.

Martin, T.N. (1984). Role stress and inability to leave as predictors of mental health. Human Relations, 37(11), 969-983.

Maslach, C., & Jackson, S.E. (1985). The role of sex and family variables in burnout. Sex Roles, 12(7-8), 837-851.

Mason, J.W. (1975). A historical view of the stress field. Journal of Human Stress, 1, 22-36.

Matteson, M.T., & Ivancevich, J.M. (1987). Controlling Work Stress. San Francisco: Jossey-Bass.

Mavrogiannis, A., & Jackson, D.N. (1987). Empirical evaluation of a profile measure of Type A behavior. Paper presented at the second annual conference of the Society for Industrial and Organizational Psychology. April.

Mechanic, D. (1978). Medical Sociology. New York: The Free Press.

Miles, R.H. (1976). A comparison of the relative impacts of role perceptions of ambiguity and conflict by roles. Academy of Management Journal, 19, 25-35.

Monroe, S.M., & Peterman, A.M. (1988). Life stress and psychopathology. In L. Cohen (Ed.), Research on Stressful Life Events: Theoretical and Methodological Issues, (31-63). Newbury Park CA: Sage.

Moss, L. M.D. (1981). Management Stress. Reading, Mass: Addison-Wesley.

Mowrer, O.H. (1939). A stimulus—response analysis of anxiety and its role as a reinforcing agent. Psychological Review, 46, 553-565.

Norsus, M.J. (1988). SPSS/PC+ Advanced Statistics. Chicago, Ill: SPSS, Inc.

Olson, D.A., & Telrick, L.E. (1987). A multivariate analysis of a stress—support—satisfaction model. Paper presented at the second annual conferences for the Society for Industrial and Organizational Psychology, April.

O'Neill, C.P. (1985). Working women: A study of relationships between stress, coping and health. Journal of Psychosomatic Obstetrics and Gynecology, 4(2), 105-116.

Parasuraman, S., & Alutto, J.A. (1981). An examination of the organizational antecedents of stressors at work. Academy of Management Journal, 24(1), 48-67.

Parker, D.P., & DeCotiis, T.A. (1983). Organizational determinants of job stress. Organizational Behavior and Human Performance, 32(2), 160-177.

Pendergrass, V.E., & Ostrove, N.M. (1984). A survey of stress in women in policing. Journal of Police Science and Administration, 12(3), 303-309.

Pennebaker, J.W. (1982). The Psychology of Physical Symptoms. New York: Springer-Verlag.

Phillips, J.B., & Endler, N.S. (1982). Academic examinations and anxiety: The interaction model empirically tested. Journal of Research in Personality, 16, 303-318.

Plant, M.A. (1979). Drinking Careers. London: Tavistock.

Quick, J.C., & Quick, J.D. (1984). Organizational Stress and Preventative Management. New York: McGraw Hill.

Rhodewalt, F., Hays, R.B., Chemers, M.M., & Wysocki, J. (1984). Type A behavior, perceived stress, and illness: A person—situation analysis. Personality and Social Psychology Bulletin, 10(1), 149-159.

Romano, J.L. (1984). Stress management and wellness: Reaching beyond the counselor's office. Personnel and Guidance Journal, 62(9), 533-537.

Ruben, D.H. (1986). The management of role ambiguity in organizations. Journal of Employment Counseling, 23(3), 120-130.

Russek, H. (1965). Stress, tobacco and coronary heart disease in North American professional groups. Journal of the American Medical Association, 192, 189-194.

Russek, H.I., & Zohman, B.L. (1958). Relative significance of heredity, diet, and occupational stress in coronary heart disease of young adults. American Journal of Medical Science, 235, 266-275.

Russell, D.W., Altmaier, E., & Van-Velzen, D. (1987). Job related stress, social support, and burnout among classroom teachers. Journal of Applied Psychology, 72(2), 269-274.

Sarason, I. (1980). Introduction to the study of test anxiety. In I.G. Sarason (Ed.), Test Anxiety: Theory, Research, and Applications. Hillsdale, N.J.: Erlbaum.

Sarason, S. & Madler, G. (1952). Some correlates of test anxiety. Journal of Abnormal and Social Psychology, 47, 810-817.

Sarason, S.B., Mandler, G., & Craighill, P.C. (1952). The effect of differential instructions on anxiety and learning. Journal of Abnormal and Social Psychology, 47, 561-565.

Schuler, R.S. (1980). Definition and conceptualization of stress in organizations. Organizational Behavior and Human Performance, 23, 184-215.

Seeman, M. (1959). On the meaning of alienation. American Sociological Review, 24, 783-791.

Seeman, M. (1971). The urban alienation: Some dubious theses from Marx to Marcuse. Journal of Personality and Social Psychology, 19, 135-143.

Seers, A., McGee, G.W., Serey, T.T., & Graen, G.B. (1983). The interaction of job stress and social support: A strong inference investigation. Academy of Management Journal, 26, 773-284.

Selye, H. (1956). The Stress of Life. New York: McGraw—Hill.

Selye, H. (1973). Evolution of the stress concept. American Scientist, 61(6), 692-699.

Selye, H. (1976). The Stress of Life. New York: McGraw—Hill.

Shirom, K. (1986). On the cross-environment generality of the relational view of stress. Journal of Environmental Psychology, 6, 121-134.

Spielberger, C.D. (1973). Anxiety: State-trait-process. Paper presented at the Annual Meetings of the Southeastern Psychological Association. New Orleans, April.

Srivastava, K., & Srivastava, A.K. (1985). Job stress, marital adjustment, social relation and mental health of dual career and traditional couples: A comparative study. Perspectives in Psychological Researchers, 8(1), 28-33.

Srivastave, A.K. (1985). Moderating effect of need for achievement on role stress-job anxiety relationships. Psychological Studies, 30(2), 102-106.

Strube, M.J., & Werner, C. (1985). Relinquishment of control and the Type A behavior pattern. Journal of Personality and Social Psychology, 48(3), 688-701.

Tokar, E., & Feitler, F.C. (1986). A comparative study of teacher stress in American and British middle schools. Journal of Early Adolescence, 6(1), 77-82.

Walker, C.R., & Guest, R.H. (1952). The Man on the Assembly Line. Cambridge, Mass: Harvard University Press.

Warshaw, L.I. (1979). Managing Stress. Reading Mass: Addison-Wesley.

Waston, D. (1958). Intraindividual analyses of positive and negative affect: their relation to health complaints, perceived stress, and daily activities. Journal of Personality and Social Psychology, 55, 128-141.

Watson, D., & Clark, L.A. (1984). Negative affectivity: The disposition to experience aversive emotional states. Psychological Bulletin, 98, 465-490.

Wolff, H.G. (1953). Stress and Disease. Springfield, Ill: Charles C. Thomas.

Wolff, S., & Wolff, H.G. (1943). Gastric Function: An Experimental Study of Man and His Stomach. New York: Oxford University Press.