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## Stress and Physicians: An Inquiry into the Role of Stress Resistance Resources in Mediating the Stress-Strain Relationship during a Pediatric Internship and Residency

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STRESS AND PHYSICIANS:  
AN INQUIRY INTO THE ROLE OF STRESS RESISTANCE RESOURCES  
IN MEDIATING THE STRESS-STRAIN RELATIONSHIP  
DURING A PEDIATRIC INTERNSHIP AND RESIDENCY

by

Robert D. Annett

A Dissertation Submitted to the Faculty of the Graduate  
School of Loyola University of Chicago in Partial  
Fulfillment of the Requirements for the Degree of  
Doctor of Philosophy

June

1985

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A number of others have also contributed substantially to the completion of this dissertation and they deserve special acknowledgement also. To my wife, Renate Savich, whose daily hassles as a pediatric resident provided me with the case study data that ultimately resulted in this study.

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## DEDICATION

This study is dedicated to my wife Renate without whose consistent support this project would have been impossible. Despite the stresses of her residency training she found the time to be understanding of the stresses of a husband writing a dissertation.

This study is also dedicated to the interns and residents who took the time and effort to complete a rather lengthy survey. In so doing they provided much knowledge about stresses during the training of pediatric interns/residents. I am eternally grateful for your efforts.

## VITAE

The author, Robert D. Annett, is the son of Robert W. and Margaret (Quedens) Annett. He was born on May 26, 1954 in New York, New York.

His elementary education was obtained in the public schools of Park Forest, Illinois and Sayerville, New Jersey. Secondary education was completed at Arlington High School in Arlington Heights, Illinois where the author was graduated in 1972.

The author initially attended Western Illinois University and subsequently transferred to and graduated from the University of Iowa in 1976 with a major in Psychology. He went on to complete one semester of graduate coursework at the University of Wyoming and thereafter took a leave of absence to travel the world. In 1978 he returned to Chicago and enrolled in the part-time program in the School of Social Work at Loyola University of Chicago. He was graduated from the Social Work program in 1981. In the fall of 1981 he entered the Ph.D. program in Counseling Psychology in the Department of Counseling Psychology and Higher Education at Loyola University of Chicago. He was fortunate enough to be granted departmental assistantships during the 1981 and 1983 academic years. In 1982 the author was awarded an Internship at the Loyola University Counseling Center. In September 1984 he began a one year, full-time Predoctoral Psychology Internship at Cook County Hospital in Chicago.

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## CHAPTER I

### INTRODUCTION

The impact of stress on biological and social systems has become a major focus for research in the social sciences. Among the issues being investigated by psychologists is the relationship between stress and illness. Numerous books and articles have attempted to describe the nature of this relationship (Antonovsky, 1979; Haan, 1977, 1979; Kobasa, 1979; Kutash, Schlesinger, et al., 1980; Lazarus, 1974; MacDougall, 1983; Moos, 1979; Rabkin and Struening, 1976; and Williams, Ware and Donald, 1981), and much emphasis has been directed at providing empirical support for the relative contributions of "stress resistance resources" (see Kobasa, 1982) in mediating the relationship between stress and illness.

Antonovsky (1979) originally developed the idea of stress resistance resources which then were condensed by Kobasa (1982) into four essential components. The first of these concerns an individual's personality resources. Kobasa particularly emphasizes commitment to work and lifestyle, and ability to exert control in situations as the principal personality resources. Coping resources are another essential aspect of one's stress resistance resources and entail one's appraisal of and response to stressful situations. Kobasa (1982) argues that cop-

ing occurs in a variety of ways, but can be generally categorized as either adaptive (e.g. engaging in activities to reduce the stress one is experiencing) or regressive (e.g. withdrawing physically from a situation). Social support networks are the third stress resistance resource. Kobasa speaks of the social support network as the number of people an individual can talk to about the stress(es) they are encountering. Finally, Kobasa postulates exercise resources (the degree to which people exercise and the type of exercise they employ) as a stress resistance resource. Stress resistance resources are theorized to modify the relationship between environmental stress and illness, and more particularly in the relationship between stress and strain (the symptoms that are viewed by Kobasa as precipitants of illness).

The present study was designed to examine the relationship between stress and strain with close attention directed to the role played by stress resistance resources in mediating the stress-strain relationship. Stress in this context is conceptualized in environmental terms as an event or set of circumstances that require a response (i.e. an adaptive or regressive response) from the individual. Coyne and Holroyd (1983) include among these events such phenomena as tornadoes, earthquakes, fires, imprisonment, military service, crowding, or work overload. Osipow and Spokane (1981) conceptualize work stress in environmental terms. They argue that work stress is the product of the work environment and the roles one's job holds. These roles are described as role overload, role insufficiency, poorly defined role boundaries, role ambiguity, role responsibility, and aspects of the physical environment.

Strain is herein conceptualized as physiological and psychological symptoms of environmental stress. Kobasa (1982) maintains a similar distinction between stress and strain as proposed here. She conceptualizes strain as an immediate reaction to environmental demands (i.e. work stress). Strain is the inevitable consequence of one's stress resistance resources being ineffective or overburdened by environmental stress. The responses which represent strain are not physical illnesses, like coronary heart disease, but instead are simply conceptualized as negative physiological and psychological symptoms (e.g. loss of appetite, nervousness, and crying spells).

High levels of stress and the resultant strains experienced during professional training can have detrimental effects. Among the professionals considered subject to high levels of environmental stress, physicians in training have been characterized as striving in the face of a tremendous degree of stress (Brent, 1981; Gaensbauer and Mizner, 1980; Harwood, 1984; Pfiffering, 1983; Scott, 1983; Shershow and Savodnik, 1976; and Werner, Adler, Robinson, and Korsch, 1979). The physician's internship and residency compose a period of training that occurs after graduation from medical school and before the fledgling physician begins to practice medicine as an independent practitioner. The formal role distinction that previously existed between internship and residency has been altered in recent years. The progression from intern to resident is now marked by a gradual increase in the physician's responsibility for independent decision making and patient care.

Pfiffering (1983) characterizes internship and residency training as a "traumatic emotional transition" between student and professional. He views this period as one in which the intern's and resident's coping resources (i.e. stress resistance resources) are taxed to their fullest. Not only are the interns and residents forced to meet the challenges of their academic training, but they must also cope with the professional identity change that is concomitant with the transition from medical student to intern and resident.

In recent years medical training at all levels has increasingly been the object of closer scrutiny than heretofore. For example, Cousins (1981) takes a negative position in his description of the medical internship as a "human meat grinder" that he equates with fraternity hazing. Specifically what he refers to is the internship's long duty hours (often referred to as the intern being "on call"). This typically entails the physician's caring for patients at the hospital throughout the night, every third or fourth night. Cousins argues that internship training is not conducive to the physician's feeling of compassion for his/her patients, let alone the problems raised by the decision making abilities of a physician who is physically and emotionally exhausted. As such, he raises the question of how to foster the psychological development and maturation of the intern and resident, on the premise that the quality of medical care could be substantially enhanced with a well rested physician.



Psychological models broadly describing the development and maturation of physicians have been forwarded by several authors. Gaensbauer and Mizner (1980) have focused on the developmental stresses of medical school education. Though limited to the medical school environment, their paper appears nonetheless to be representative of views held by many physicians involved in medical education and training from medical school through the residency. Gaensbauer and Mizner essentially view each year of medical school as offering a unique challenge and consequently unique stresses to the developing physician. For example, in the third year of medical school the student begins clinical work and thus begins to encounter life and death situations on a daily basis. Gaensbauer and Mizner present a descriptive analysis of the stresses in medical education, as well as illustrative case examples of students being stressed by the demands of medical school.

The issue of a model for professional development during the physician's internship and residency has rarely been addressed. Brent (1981) points out that most of the literature on resident development has focused on the problems of psychiatry residents at the expense of attempting to understand the common difficulties of residents across other medical specialties. Brent attempts to address this issue by identifying significant developmental tasks of the residency according to an Eriksonian epigenetic model. He views the residency as primarily being devoted to the physician's skill development. However, he notes that residents are also exposed to critical issues such as control, vul-

nerability, boundary maintenance, problem-solving, and professional identity. It may be concluded then that both Brent's (1981) and Gaensbauer and Mizner's (1980) positions are grounded in a theoretical orientation. Yet these authors offer little empirical justification for their models. One of the purposes of the present investigation is to generate some empirically based findings which may shed light on the validity of Brent's (1981) and Gaensbauer and Mizner's (1980) positions relative to internship and residency training.

Literature on the stress experienced during internship and residency provides an overwhelming consensus of opinion that young physicians are stressed (e.g. Nelson and Henry, 1978; Valko and Clayton, 1975). Yet what is consistently unavailable in this literature is a thorough investigation of the stress(es) experienced by interns and residents. Valko and Clayton (1975) used an interview procedure with 53 first year medical residents who had just completed their internship and found 30 percent of them "had a depression in their internship." This result is interpreted by these authors as indicative of the high level of stress experienced during the internship.

Nelson and Henry (1978) employed a rationally developed survey of "problems" with residents in a family practice residency to identify the issues of most significance to these individuals. The major concerns of the respondents included their limited time for leisure and friends, spouse complaints, scarcity of study time, lack of self-confidence, and reservations about their career choice. Nelson and Henry use the

respondent's self reported problems as the basis for their argument that there are many psychological stresses impinging upon physicians in their residency.

An important study of the stress(es) associated with internship and residency is a longitudinal study of a pediatric internship done by Adler, Werner, and Korsch (1980). They identified certain coping behaviors utilized by interns. A major contribution of this study was its attempt to roughly identify potent sources of stress, coping responses, and changes in these factors during the internship. Yet despite the methodological strengths of this longitudinal study, it can be criticized on several grounds. Their use of a rationally derived questionnaire lacked the reliability and validity parameters necessary for psychological instrumentation. Also, the authors used a vague definition of the constructs they were employing. This led to conceptual confusion as in the example of the construct "stress" which was operationalized as both a stimulus and a response, and was also used synonymously with strain.

The studies reported above provide an important first step in attempting to identify the sources and results of stresses associated with the physician's training in internship and residency. Yet the problem with in each of the preceding studies has been their rather naive and simplistic approach to the complex problem of the relationship between stress and strain symptomatology. At best, from an empirical viewpoint, it can be fairly stated that the burden of the evidence

uncovered in this literature is impressionistic, but combines to form a reasonable base for closer experimental analysis. For example, the degree and types of work stress endured by residents, though frequently documented as fact, have not received rigorous empirical attention. Additionally, little is known about the types of strain that are experienced as a consequence of the stressors residents perceive. Even less is known about the various stress resistance resources (i.e. commitment, coping, and social support) that may mediate and lessen or exacerbate the impact of stress occurring during residency. Finally, little has been learned about the individual differences that underlie an intern/resident's ability to handle stress. It is evident from an inspection of the stress research literature (e.g. Dohrenwend and Dohrenwend, 1974) that while some individuals exposed to high levels of stress continue to perform well, others do not and the result may be manifested in the development of psychological and physical symptoms and illnesses.

The overall purpose of the present study is to examine the relationship between stress and strain in pediatric interns and residents. Considering that there is a lack of empirical evidence describing the relationship between stress, strain, and stress resistance resources with physicians in their internship and residency, there is a need for a thoroughly controlled examination of these variables. A more rigorous research design has been employed than in previous stress studies so as to more completely provide a description of the occupational stress associated with the pediatric internship and residency, as well as to

detail the stress resistance resources that may mediate the relationship between stress and strain. In addition, some individual differences related to personality characteristics among the interns and residents will be systematically examined through the utilization of a psychological adjustment inventory.

The usefulness of this study is based on the premise that a more empirically based understanding of the noxious stress experienced by residents, and the stress resistance resources which successfully help them cope, could lead to interventions within the medical education system that would ameliorate the problems of intern/resident stress and strain. Importantly, more thorough knowledge about the factors influencing the development of physicians may lead to some restructuring of the medical education system which could benefit physicians and ultimately the public.

Additionally, firmer grounding on which to base appropriate interventions with this group of individuals will be acquired. The existing literature on interventions for medical students, interns, and residents (see Berg and Garrard, 1980 and 1983; Goldsmith, Ngissah, and Woolsey, 1980; Kantner and Vastyan, 1978; and Siegel and Donnelly, 1978) suggests that the interventions that have been developed have focused primarily on developing social support groups and have been founded on little or nonexistent empirical data bases. Findings from a study such as proposed herein may suggest other key targets for interventions that help an intern and resident deal more successfully with stress.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Overview

A review of the literature is the focus of this chapter. The first section provides a more detailed description of the basic concepts and constructs introduced in the first chapter. The constructs reviewed include: stress, strain, and the stress resistance resources (i.e. commitment, coping, and social support). The second section entails an extended definition and description of internship and residency training in pediatrics. Included is a detailed description of a typical pediatric residency program. The third section presents an examination of the literature pertaining to the stresses of a physician's internship and residency. Specific issues related to the internship and residency such as sleep deprivation and other reported stresses will be addressed. One body of literature on the results for a stressed physician will be examined. Finally, at the end of this chapter the questions under consideration for this study will be presented.

#### Major Constructs

Stress. Stress is a construct that has a long history and multiple meanings associated with it. Hinkle (1977) has traced the construct of stress back to the 17th century where it was used synonymously with

"hardship, straits, adversity, or affliction", in the process of explicating more contemporary views of stress which view it in even broader terms. What is elucidated in this discussion are the three general orientations that investigators have taken to defining stress. Derogatis (1982) has conceptualized these as the stimulus oriented approach, the response oriented approach, and the interactionist approach.

A stimulus orientation to the concept of stress has viewed it as the occurrence of "life events" that are regarded as stressful and precipitate a response from the organism. These life events are conceptualized as stimuli of either a positive or negative valence, that are demanding or disorganizing for the individual. Different approaches have been taken in the measuring of these events. For example, Holmes and Rahe (1967) developed and used the Schedule of Recent Experiences (SRE).

The SRE is a 43-item self-administered questionnaire that people respond to by checking events that have happened to them in the preceding six months to one year. Events included are both desirable and undesirable. This instrument furthermore includes weights for the impact of the various life changes. These weights are described as "life change units". The sum of these life change units is used as the amount of individual social readjustment required during the preceding six months or year. Thus stress is operationalized as the accumulation of life experiences.

Masuda and Holmes (1978) have provided a summary of the work on stressful life events for the sample groups they have studied. Specifically, what they present are mean group annual frequencies for life events. Certain groups such as heroin addicts (n=50) and alcoholics (n=66) had very high annual frequencies of life events (26.3 and 19.7 respectively). On the other hand, groups with low annual frequencies included medical students (n=229, X=5.0), medical residents (n=89, X=5.2), and pregnant mothers (n=50, X=5.2). These results raise several interesting questions in terms of assessing the stress associated with a pediatric internship and residency. These questions will be addressed later. However, other issues that are more germane to the use of life events as a meaningful measure of stress have been raised.

Derogatis (1982) has documented the empirical support for the SRE and reported that many investigators consider it both a sensitive and predictive measure. However, he has also documented the major shortcomings of the SRE and concluded that there are alternative measures of life stress for an investigator to consider (e.g. the Life Experiences Survey; Sarason, Johnson, and Siegal, 1978). He advocates that the purpose of an investigator's research should determine which of the stimulus/events oriented instruments would be most appropriate for use. Derogatis concluded that when there is a need for "precise individual measurement of stress", stimulus (i.e. event) oriented instruments are a poor choice. He reasoned, as have Rabkin and Struening (1976), that the SRE's use of both positive and negative, and expected and unexpected



life events to determine the stress one has experienced is inappropriate. Undesirable events (e.g. sudden death of a family member) have a very different and probably more detrimental effect on the individual than do desirable events (e.g. marriage). Unexpected life events most likely also have a detrimental effect on the individual. In light of this argument, alternatives to the life events orientation to stress have been proposed.

The response oriented approach to stress views it as a reaction of the organism to conditions that, either consciously or unconsciously, are experienced as noxious (Pearlin, Menaghan, Lieberman, and Mullan, 1981). The roots of this orientation can be traced to Selye's (1956) "General Adaptation Syndrome" which characterizes stress as a set of nonspecific physiological reactions to various noxious environmental stimuli. Derogatis (1982) pointed out that the theoretical base to this approach has been linked with the study of psychopathology in that psychological disorders, or aspects of them, are considered responses characterizing stress. In light of this orientation, the results of psychometric instruments assessing characteristics such as mood, psychological adjustment, personality, and self concept have been interpreted as stress responses. This orientation considers the multidimensional aspects of stress as a response.

Coyne and Holroyd (1982) have supplemented the stress response orientation with the physiological research literature. In the laboratory studies reviewed, stress is conceptualized as a hormonal response

to noxious agents such as toxins, bacteria, or physical mutilation. The authors were critical of this line of research because of the isolation of physiological processes from a psychosocial context. Coyne and Holroyd as well as Derogatis raise the important theoretical point that a more useful definition and operationalization of stress will result if more of the dimensions of stress can be identified and elaborated upon.

The interactionist orientation conceptualizes stress as a person-environment interaction in which the demands of the transaction exceed the resources of the individual. Lazarus and his associates (i.e. Cohen and Lazarus, 1979; Coyne and Lazarus, 1980; Holroyd and Lazarus, 1983; and Lazarus, 1981) have been identified as the major proponents of this approach and have consequently criticized both stimulus orientations and response orientations as being overly simplistic. Lazarus and his associates offered what they describe as a dynamic system wherein feedback loops provide for a constant interrelation between the individual and the environment. As such they abandoned the notion of linear causality between stimulus and response that was typical in earlier models for understanding stress. Their orientation has resulted in research that emphasizes the individual's appraisal of events in their environment. They see the outcome of the individual's appraisal as resulting in the presence or absence of a stress reaction.

Derogatis (1982) has criticized the transactional perspective on the grounds that it leads to psychometric difficulties. These difficulties involve the notion that one is measuring a dynamic system. Any

measure of a dynamic system is limited by several factors. The first is that most instruments take only static measurements. Secondly, the current stress instrumentation, for the most part, simply assesses stress along one dimension. Finally, in evaluating a dynamic system the investigation itself elicits some systemic changes. These difficulties basically reflect Lazarus's proposition that a transactional system is always in flux and that attempts to measure the system can grasp only a part of it at the expense of capturing the essence of the phenomena that are producing the stressful reaction.

Coyne and Holroyd (1983) have pointed out another important measurement problem. The traditional linear paradigm including dependent and independent variables have become irrelevant within the framework of stress research. They propose that investigators stop conceptualizing variables in terms of simple temporal sequences. Instead of proposing questions such as "How does Event A cause Condition B", they pose the question as "How is Event A involved in the initiation and persistence of Condition B?" The implication in terms of the traditional paradigmatic language involves a multidimensional assessment of events and conditions that are subsequently examined in terms of their interrelations and pathways of influence.

One of the problems evident in any discussion of stress is that of conceptual clarity. Stress is a construct that can be defined and operationalized in a variety of ways. There are serious methodological problems in using the concept of stress in such different ways. Differ-

ent investigators may study the same phenomenon and yet construe the characteristics associated with it in completely different terms. What is ideally needed, according to Hinkle (1977), is to abandon the psychological construct of stress. There seems to be little chance of this occurring. An alternative is to support the development of a more precise psychological lexicon (i.e. a consistent definition of the variables under study). What has been proposed by a few investigators (e.g. Hinkle, 1977) is the precise definition of the psychological concepts and constructs utilized in each piece of research. In other words, with each study investigators should clearly and specifically define and operationalize their terms.

Therefore, for purposes of this study, the construct of stress will be conceptualized as an event or set of circumstances that require a response and may result in a poor person-environment fit. Such an event or set of circumstances can be defined in a variety of ways and range from such events as natural disasters (e.g. earthquakes) to the set of circumstances herein referred to as occupational stress. Occupational stress is the term used to describe both work-environment demands and role characteristics within one's occupation/job. It should be noted that in this conceptualization of stress an attempt has been made to speak of it as neither a positive or negative event. Haan (1982) writes of stress as not necessarily an event that leads to some type of deterioration in the individual or environment. Stress can be bad for the individual as well as good. In fact some people like stress. One

facet of stress that appears relevant to Haan's conceptualization is occupational stress.

Osipow and Spokane (1983) have operationalized occupational stress as role characteristics common to all jobs. They have delineated six specific role characteristics that constitute the elements of occupational stress. These elements include: role overload, role insufficiency, poorly defined role boundaries, role ambiguity, role responsibility, and the characteristics of the physical environment. Osipow and Spokane proposed that these factors be treated either separately or as a total summative score to describe occupational stress. The usefulness of how they have conceptualized occupational stress is that they have provided descriptive factors which constitute stress in any occupational setting. The result is a reasonable attempt to provide conceptual clarity to the amorphous construct of stress. Rather than describe stress on a singular dimension, as seems to be the case when life events are used as the sources of stress, Osipow and Spokane provide a refined multidimensional description of the concept. In so doing they have provided conceptual clarity as well as increased the descriptive power of the construct, ultimately giving stress and its constituent components more meaning.

Strain. Unlike stress, the construct of strain has received relatively little attention in the scientific literature. Within health psychology, the general and specific effects of stress on a person's physical and psychological health have grown to be a major research

area. The effects of stress have been investigated by a number of investigators (see Cohen, 1979; Goldberger and Breznitz, 1982; and Pearlman, Menaghan, Lieberman, and Mullan, 1981, for reviews) and have typically probed the relationship between recent changes in life events and the onset of illness. In these studies the onset of illness is identified by the appearance of the clinical symptoms of disease. These symptoms manifest themselves anywhere from two months to two years after a stressful life event.

Kobasa (1982) and others (e.g. Bastiaaus, 1982; Cohen and Lazarus, 1979; Dohrenwend, 1979; Farber, 1982; Garcia, 1981; Melick, Logue, and Fredrick, 1982; and Selye, 1982) have noted, however, a more immediate reaction to stressful stimuli. This reaction is known by a variety of terms (e.g. fight or flight, stress response, etc.), but in the interest of conceptual clarity, it will hereafter be referred to as strain. Strain is the negative physiological and/or psychological symptom(s) of environmental stress. It is an immediate reaction to the environmental demands that overburden one's stress resistant resources. The essential distinction between strain and illness is that strain is an immediate response and is characterized in terms of an acute symptom (e.g. headache, and anxiety), rather than an identifiable medical illness (e.g. peptic ulcer, sinus infection, and heart attack).

The common paradigm for investigating the stress-illness relationship has been that of correlating stress(es) with self-reported illness. Despite the accumulating evidence that there is a significant relation-

ship between these variables, investigators such as Rabkin and Struening (1976) and Thoits (1982) have noted that the relationship between stress and illness is moderate at best (.17 to .35) and does not account for much of the variance. That is, these coefficients indicate a relatively small amount of the variance in illness can be attributed to life events. Rabkin and Struening (1976) argue that the instrumentation utilized to measure the variables under consideration need to be improved and refined. What is essentially being called for are instruments that not only possess increased psychometric sensitivity, but also provide more meaningful descriptions of the variables under consideration. Kobasa's (1982) Symptoms of Strain measure appears to be a meaningful attempt to supply an instrument of psychometric integrity and sensitivity.

Kobasa (1982) has found highly significant correlations between strain and life events ( $r=.38$ ,  $p<.005$ ), regressive coping (i.e. denying, minimizing, or escaping from stressful situations) ( $r=.34$ ,  $p<.005$ ), and illness ( $r=.29$ ,  $p<.005$ ). The strength of this instrument appears to lie in its multidimensional assessment of strain, its high reliability as a psychometric instrument, and its significant relationship with other important variables.

Stress Resistance Resources. The stress-strain relationship cannot be studied in isolation. If it were to be, the conclusions derived would not only be confusing, they would represent inadequate knowledge of the complex interplay existing between these resistance resources and

other variables. What remains to be discussed then are the important influences of the variables hypothesized to mediate the stress-strain relationship.

Antonovsky (1979) has developed a global model of stress and the variables mediating the relationship between stress and the subsequent psychological and physiological outcomes. He detailed a variety of mediating variables including: knowledge, material, intelligence, ego identity, coping strategy, social supports, commitment, cultural stability, magic, religion, philosophy, and a preventative health orientation. Together they constitute a construct referred to as stress resistance resources in that they are said to assist the individual in withstanding the potentially negative effects of stress.

Use of the resources, either individually or in conjunction with one another, mediates the relationship between stress and strain/illness. Mediating the stress-strain relationship implies that these variables directly and indirectly affect the individual's response to stress. The effect may be beneficial for the individual in that strain is reduced or removed, or the resource(s) may only temporarily benefit the individual and eventually result in illness. That is, regressive coping resources may subsequently result in illness.

Theoretically, the effective use of stress resistance resources decreases the probability of strain arising whereas the ineffective use of the resources increases the probability of strain arising. The paradigm is complicated by resources that, for example, initially operate



for the benefit of the individual, but because of a high amount of stress may subsequently become taxed and ineffectual. Such might be the case when an individual relies on a particular style of coping (i.e. referred to previously as regressive coping) that may initially moderate the effects of some type of stressor, yet later may lead to further stress and/or the delayed expression of strain symptomatology.

Kobasa (1982) has investigated one aspect of this complex interrelationship. She examined the effect of a regressive coping style on strain symptomatology and illness behaviors within a sample of highly stressed individuals. She found that regressive coping was moderately, though significantly, correlated with strain symptoms.

There appear to be two predominant trends in the literature on stress resistance resources. In one, a specific resource is examined in detail. Moos and his associates (see Billings and Moos, 1982a, 1982b; Holahan and Moos, 1981; and Moos, 1977) and others (see Conway, 1983; Shumaker and Brownell, 1983; Thoits, 1982; and Turner, 1981) have examined the mediating or buffering effects of one's social support system on strain, illness, and well-being. Others, notably Lazarus (see Cohen and Lazarus, 1979; Holroyd and Lazarus, 1982; and Lazarus, 1977) view coping as the particular variable that attenuates the stress-strain relationship. Still others such as Kobasa and associates (see Kobasa, 1979 and 1982; and Kobasa, Maddi, and Courington, 1981) have examined the role played by particular personality variables such as alienation and commitment.

An alternative trend apparent in the literature has been that of examining a combination of the stress resistance resources in mediating the stress-strain relationship. This approach has best been characterized in the recent work of Sekel (1981), Kobasa (1982), and Billings, Cronkite, and Moos (1983). These researchers believe that there are relative contributions to be made by the various mediating variables. These contributions are not simply an effect of the type and extent of the stress experienced, but are also a function of the availability of other stress resistance resources to the individual. In this study three of the more extensively researched stress resistance resources will be investigated for their individual and interactive effects on the stress-strain relationship. These stress resistance resources will include commitment, coping, and social support.

Commitment, as defined by Kobasa (1982), is the ability to believe in the truth, importance, and interest value of what one is doing, and the willingness to exercise control in social situations in which one is involved. Doty and Betz (1981) base their work on a similar definition of commitment, but differ in their narrower, career-oriented operationalization of the term. Earlier work by Kobasa (1979) demonstrated that this resistance resource accounted for the primary difference between the health of two groups of stressed executives. A highly committed group remained healthy (i.e. reported less strain/illness) despite the level of stress encountered. The less committed group was more likely to report stress-related illness(es). These findings were viewed as

partially supporting Antonovsky's (1979) position that commitment is the overriding resistance resource.

Doty and Betz (1981) have taken this position one step further by theorizing that a high level of commitment may have a negative impact on psychological and physical health. They developed the Work Attitudes Questionnaire to distinguish between highly committed individuals who approach their work in a psychologically healthy manner and those who do not. They believe that the latter represent the detrimentally committed individual such as characterized in the Type A behavior pattern. The former represent the positively committed people who place heavy but not exclusive emphasis on their work. Though research utilizing this instrument has been limited, its use has been encouraged by the results of Doty's work (1980).

Another major stress resistance resource is coping. Coping is the construct utilized to describe the behavior(s) that typically protect people from being physically and psychologically harmed by problematic social experiences. Furthermore, coping mediates the positive and negative impact that societies have (Pearlin and Schooler, 1978). Essentially then, coping responses are "things that people do" to deal with the stress(es) they encounter. Pearlin and Schooler view coping strategies as functioning in three distinct ways: they can act to modify a situation; control the meaning of a problem before strain occurs; and assist an individual to control strains that have arisen.

An alternative, though not completely incompatible viewpoint has been offered by Osipow and Spokane (1981). Their four classes of coping behaviors are based on the work of Newman and Beehr (1979) and include: recreational coping, physical coping, social supports, and rational/cognitive coping. Recreation refers to the extent to which an individual makes use of and receives pleasure from recreational activities. It seems to overlap with Pearlin and Schooler's coping behaviors that assist one in controlling strains that have arisen, but also moves beyond this conceptualization and indicates a response that may help control a problem before strain occurs. An example of this is a weekend is used for relaxation purposes. Physical coping refers to the extent one engages in healthy activities to reduce or alleviate chronic stress. Again, Pearlin and Schooler's coping responses that assist a person to control a problem before strain occurs and after strain has arisen is conceptualized in Osipow and Spokane's physical coping concept. They describe social support as the degree emphasis is placed on family and friends in coping with stress. (The quantitative and qualitative aspects of this construct will be separately examined later on. This will allow for a more detailed elaboration on the construct of social support.) Finally, rational/cognitive coping refers to the extent to which cognitive skills are used in the face of work related stress. This type of coping appears to touch on all three of Pearlin and Schooler's functions of coping.

One aspect of coping that has generally been absent from the literature is what Kobasa (1982) calls regressive coping. Regressive coping, as opposed to Osipow and Spokane's primarily adaptive coping responses, is characterized by attempts to avoid or withdraw from stressful environmental events. These coping responses may lead to a temporary reduction in strain, but ultimately prove to be detrimental to the individual. That is, the use of regressive coping techniques is more likely to manifest strain and illness behavior than would be the case with the use of adaptive coping behaviors. As Kobasa's (1982) research has demonstrated, people who avoid regressive coping are spared strain symptomatology and those who use regressive coping are eventually more likely to exhibit strain symptomatology. It may be concluded then that examining regressive coping behaviors may further help account for changes in health status.

The inherent appeal of using Osipow and Spokane's concept of coping in conjunction with Kobasa's is that these constructs, and their operationalized content, provide descriptive information as to what a person does. In contrast to Pearlin and Schooler's functional analysis of coping behaviors, Osipow and Spokane's measure plus Kobasa's instrument appear to provide a meaningful description of coping responses. The increased meaning of these measures can be seen in terms of the investigator learning what the person actually does to cope. The function of what the person does will ultimately be discerned in terms of the statistical outcome when the coping strategies are contrasted with strain symptomatology scores.

Social support is the final stress resistance resource to be reviewed. Thoits (1981) has provided an extensive review of the social support literature and problems with the way it has been studied. One of the foremost of these is the definition of social support. Thoits points out that the conceptual problems that run throughout this body of literature (and which appear to be akin to the conceptual problems of stress) have resulted in poorly conceived operationalizations of social support. Schumaker and Brownell's (1983) review of the social support literature identified over ninety elements that have been used to describe social support. They as well as Thoits acknowledge that many investigators have failed to provide a specific definition of social support before operationalizing the term. The apparent solution to this issue lies in an investigator accurately defining his/her concept of social support prior to its operationalization.

In this investigation social support will be defined as a multidimensional variable that describes the extent to which a person's social needs are gratified through an interaction with others (Thoits, 1981). Thoits describes this interaction with others as entailing four primary dimensions: the amount of support, the type of support (e.g. emotional support and financial support), the sources of support (e.g. family and/or friends), and the structure of the support network (i.e. a description of one's constellation of family, friends, and coworkers). Underlying this conceptualization is the assumption that social support does not necessarily involve a reciprocal relationship, though it does

involve an interpersonal transaction. One may feel supported without necessarily responding in kind.

Two essential characteristics of a social support system, quantity and quality of social support, have been investigated by Moos and his colleagues (e.g. Billings, Cronkite and Moos, 1983; and Moos and Mitchell, 1982). Quantity has three features: number of friends, the frequency of network contacts, and the number of close relationships. The quantitative aspect embodies several of the dimensions of support reviewed by Thoits (e.g. amount, sources, and structure of support). Moos and colleagues operationalize the qualitative aspect of a social support network by referring to three specific support features: the quality of a significant relationship, support from one's family relationships, and support from one's work relationships. This appears to be an important aspect of social support that Thoits has overlooked.

Examining the contributions of both the quantitative and qualitative aspects of a social support network, Billings et al. (1983) found that there was a significant difference between depressed and control subjects in the quantity and quality of their support networks. Control subjects had a significantly greater quantity of network contacts and reported higher quality network relationships. A discriminant analysis revealed that these aspects of a social support network added to the correct classification of individuals into either the depressed or control group.

Limitations in Billings et al.'s conceptualization appears to lie in the narrow operationalization of the support dimensions. The most obvious difference between the Moos et al. and Thoits definitions occurs in the perspective Thoits takes on the type of support received. She views the type of support in terms of emotional support, financial support, or as a combination of these. Moos et al.'s instruments simply examine the emotional support component while neglecting the financial support that an individual may be receiving. Despite this limitation, it does allow an investigator to examine a variety of dimensions of support. In so doing these authors take the position that social support is exclusively tied to interpersonal contacts.

Summary and Conclusions. In this section of the literature review, major constructs and concepts employed in this investigation have been detailed. Several issues are apparent at this point. First and foremost, there has been much confusion in the literature over the meaning of stress, strain, and stress resistance resources (e.g. coping and social support). The problem is further complicated by diverse lines of research that have been defined and measured differently. This study has attempted to define and conceptually identify the relations between the variables without falling subject to the meaningless use of vague terminology.

Another apparent issue is that despite a large volume of literature on stress, strain, and resistance resources, an overall paradigm for study in this field has yet to be developed. In part this has been



a function of an imprecise lexicon. However, also problematic has been an over emphasis on examining single variables rather than the multitude of variables that impinge on responses to the environment. The reason underlying this has not been explicitly stated, but is hypothesized to have developed out of the desire of social scientists to understand the unique empirical contributions of a single variable. Unfortunately, in keeping their empirical vision so narrowly focused, investigators have been unable to accurately or comprehensively grasp the multifaceted codeterminants in the etiology of strain and illness. Strain symptomatology arises out of a number of variables coming together to create the right conditions for the manifestation of symptoms. These variables cover the wide range from environmental variables to intrapsychic variables.

This study will attempt to respond to the problems in previous research by more clearly defining independent variables and dependent variables under study, and identifying and measuring three significant resistance resources. Attention has been directed to choosing both sensitive and concise instrumentation so as to minimally arouse a subject's resistance to responding. Thus a representative sample of individuals would be ensured. Considering the extraordinary time demands of a pediatric internship and residency, this was deemed appropriate.

### Internship and Residency Training

The systematic training of physicians through programmed, hospital-based internship and residency programs dates to the early 1900s. At that time, the American Medical Association (AMA), the representative association for physicians, began to call for the regulation of training for medical school graduates. Prior to that time, post-medical school training had been primarily on an apprenticeship basis. With the growth of the AMA and the increasing complexity of medicine, there developed a growing demand to elevate the competence and respectability of medical professionals. Harwood (1984) reported that with growth of post-graduate hospital-based training, young physicians became exposed to a variety of learning experiences under the supervision of a number of more experienced physicians. Initially this training experience constituted a one year commitment that is now referred to as the "internship". In the internship, a new graduate rotated through a variety of "services" composed of an array of patients and patient care activities. This experience was seen as preparing the physician for the general practice of medicine.

The increasing complexity of medicine and medical care gave rise to a plethora of specialities. The growth in the number of internship programs was accompanied by the practice of specialization in such areas as pediatrics, internal medicine, surgery, and radiology. This specialized training has become known as "residency". The residency was initially a period of one to several years in which the fledgling physician

actually lived in the hospital and received an "honorarium". The term residency training today has evolved to the point where it embodies the term internship as well. In an effort to employ a more definitive lexicon, the first year after medical school is now typically referred to as post graduate year one (PGY-1), the second year PGY-2, and so on. In some programs the lexicon of house officer (i.e. HO-1, HO-2, etc.) is utilized. Further specialization is possible in post-residency training referred to as Fellowships. Harwood (1984) reports that there are currently over 4,500 residency programs in 1,500 hospitals throughout the United States.

A Typical Pediatric Residency Program. The typical internship and residency in pediatrics is a three year full-time program supervised by a variety of full-time and voluntary faculty members. Programs are usually located in a central facility, but interns and residents also spend some time in other hospitals. In a representative program, one-half day per week throughout the internship and residency is devoted to a hospital clinic experience where the physician in training has the opportunity to provide services to local patients and their families. Each year of the internship and residency has unique programmatic elements that emphasize the overall professional development of the pediatrician. Throughout the program a physician's progress is monitored by the Chairman of the Department of Pediatrics, as well as by a faculty advisor.

The first year of the program has as an organizational framework of four to six week rotations through all the major inpatient services

of the hospital. The emphasis of the first year is on the development of basic clinical skills and attitudes for providing competent medical care. This is accomplished through "teaching rounds" where a senior staff member and a small group of medical students, interns, and residents review the treatment course of patients on a particular hospital ward. In these "rounds" various activities such as interviewing, child guidance, and various medical procedures are taught. Besides "rounds" there is the opportunity to attend a variety of teaching conferences held within the hospital. The intern's training experience is augmented by direct patient responsibility under the supervision of senior residents and staff members. Direct patient responsibility entails providing medical care to a number of patients and, every fourth night (or every third night on some services), being "on call".

While the primary emphasis of the internship is on the acquisition of skills, with the second year of the program (where the physician is then called a resident) there develops an additional emphasis on supervisory responsibilities as well as further responsibility for patient care. Together with the increased responsibilities are periodic assignments to the critical care units of the hospital (e.g. the Intensive Care Unit). Here the resident acquires some very specialized skills within the more demanding units of the hospital.

In the third and final year of the pediatrics program, the resident assumes still greater responsibility for coordinating patient care as well as for teaching medical students and interns. Residents con-

tinue to rotate through various hospital services, but at this time there is the opportunity for elective rotations in various specialities (e.g. pediatric radiology). In more rigorous programs the third year residents must also complete a research project on some subject within pediatrics.

The larger pediatric residency programs admit approximately 20 physicians per year. These physicians have applied to a program either from medical school or from other residency programs (if they are changing specialities). A specialty such as pediatrics accounts for approximately seven percent of all resident physicians. The distribution of residents by specialty has been examined in a longitudinal analysis in an article in the Journal of Medical Education (Datagram, 1972). This article provides some descriptive statistics on the distribution of residents among the various medical specialties. Surgery and Internal Medicine residencies account for nearly 40 percent of all residents. The remaining 22 recognized specialties account for between one and ten percent of residents. The article goes on to point out that though there were an additional 10,000 residents in 1970 as compared to 1960, there have been few specialties in which a noticeable change in proportion has occurred. The medical literature, though descriptive of the broad demographic characteristics of internships and residencies and having developed essential criteria for internships and residencies, has paid less attention to studying the professional development of interns and residents.

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Activities of Pediatric Interns and Residents. According to Brent (1981), people who research medical education issues have been slow to address the critical period of transition between new graduate and full fledged physician. Studies in this field rarely date before the early 1970s and typically focus solely on the activities of the developing physician. Gillanders and Heiman's (1971) study is representative of the investigations of this time. These authors used a time study observation of six interns in three different internship programs. Each intern was observed and monitored for five consecutive days. Though there were several differences in activities between the programs, overall these activities took the same number of minutes within each program. Perhaps the most salient finding was the average 99.5 hour work week by the interns and their subsequent reports of feeling fatigued and depressed by the long duty hours.

Gillanders and Heiman offer the medical education literature a more detailed examination of the activities engaged in by medical interns. Their study is of particular interest for two reasons. The first is that the results could be compared to earlier studies at another institution (see Payson, Gaenslen, and Stargardter, 1961). Secondly, the results of this study could be examined for how the activities of interns are categorized.

A similar study by Wallace and Silber (1971) examined one pediatric intern's self-reported experiences over the course of one year. Alpert, Youngerman, Breslow, and Kosa's (1973) investigation of two

pediatric interns at two institutions addressed the learning experiences of pediatric interns. Meyers, Margolis, Sheehan, Aita, and Risser (1974), studied ten residents (all PGY-2s) and classified their activities during a pediatric residency into eleven categories.

In all of these studies an attempt is made to identify the activities of pediatric interns and residents. They are also notable for their information on the learning and patient care activities of pediatric interns and residents. In focusing on learning activities these investigators have made a good first step in supplying descriptive information that is beneficial when attempting to comprehend the diverse array of tasks the new pediatrician must master. The sheer number of activities is, however, not in itself sufficient for assessing the occupational stresses and strain symptomatology that may become evident in these young doctors. One must take into account the other unique features of internship and residency that are or may be stressful, such as having to deal with problem patients and other issues within the medical environment; particularly the issues of suffering, fear, sexuality, death, and uncertainty McCue (1982).

Summary and Conclusions. In the preceding section a brief description of the evolution research on the and content of internship and residency training was offered. Special attention has been directed to the general characteristics of a pediatrics program. Tracing the historical development of internship and residency programs, it is possible to view how developments in medical technology and the growth in

patient care services has lead to an increasingly complex medical system. Within this system no one physician can be expected to master all its aspects. Therefore specialized training programs (i.e. residencies) have developed. A typical pediatrics program was briefly described as characterizing one of the specialty programs within medicine. During this program a physician acquires greater and greater responsibility for patient care, education of others, and administrative duties. It is apparent from previous research that house officers have many duties to perform and that the sheer volume of activities engaged in may be stressful and fatiguing. The fact that physicians face life and death situations, and do so while on duty for long hours, appears to heighten the impact of stressors that are part of their training.

#### Stress During Internship and Residency

In the following pages the literature relevant to the examination of stress during internship and residency will be reviewed. This research, still in its infancy, comprises a diverse body of literature in terms of the individuals and constructs studied. It should also be noted that researchers in this literature have sometimes taken a stance different than the social science literature has in its operationalization of constructs such as stress and strain. For example, stress has often been operationalized as a unique aspect of the physician's training as opposed to the typical social science literature's definition in terms of life events.



The following review of literature begins by examining the issue of professional development and its inherent stresses. Then the effect of sleep loss on a physician's performance will be examined. The issue of sleep loss has often been addressed as a major source of stress for the physician during the internship and residency. This review then turns to an examination of the empirical literature on stresses associated with the medical training environment.

Professional Development. The professional development of physicians during the course of their residency training has rarely been addressed (Brent, 1981). One reason for this may be that the training of physicians has itself been growing and changing along with the technological advances that have changed the scope and practice of the entire field of medicine. That is, more attention has been devoted to the acquisition of technical skills than to professional development of the physician. Also, as pointed out previously, there are now less distinct boundaries between internship and residency. Thus professional training is more appropriately viewed along a continuum instead of one composed of separate steps. Brent (1981) has attempted to provide a grounding in medical education theory by proposing a framework for the developmental tasks of residency (which he defines as including internship).

Brent's developmental tasks are spelled out in an Eriksonian epigenetic framework. The first of these stages is titled vulnerability versus invulnerability. Essentially it is the physician's ability to

accept feelings of vulnerability. Brent sees the second task as activity versus passivity. This is the physician's desire to cure and control versus care and nurture. The third task to be mastered is titled "helplessness versus problem solving". In other words, the physician learns to work with the medical system rather than against it. Boundary maintenance is the fourth developmental task. It involves obtaining an appropriate balance between closeness and separateness with one's patients. Finally, there is the task of developing one's professional identity. This grows out of the merger between a physician's ideal standards and more realistic self-assessments. Brent's identification of these tasks appears to be useful as it has spurred the further research and thought on the broader issue of physician development during the movement from internship to residency.

Recent interest has developed with respect to the stresses experienced by physicians. This change is reflected in burgeoning research efforts. Whereas a few years ago the most severe consequence of stress (i.e. the "impaired physician") was rarely publicly addressed, today there is a rapidly growing body of literature that addresses the problems experienced by physicians. In attempting to grasp the issues associated with high amounts of stress, models have been proposed that attempt to describe the levels of stress experienced by physicians. Howell and Schroeder (1984) have proposed one such model. They view physicians in general as individuals who, through a process of indoctrination, learn to welcome some types of stress. Physicians tend to be

"survivors" who find ways to cope with stress (Nadelson, Notman, and Preven, 1983). Stress as such is perceived as a motivator for adaptation. Howell and Schroeder delineate four levels of physician stress that form a continuum from healthy stress to stress that results in impairment.

Healthy stress occurs when environmental demands result in a physician exerting physical and emotional energy without creating an internal disequilibrium (i.e. strain). Following healthy stress is what the authors call "stress to the limit". The outstanding feature of this level of stress is that it challenges an individual's "stress tolerance" and demands coping mechanisms be utilized. Distress is the third level of stress identified. This is characterized by environmental circumstances such as role ambiguity, life changes, and large responsibility increments. The final level of stress is termed impairment. This level is operationalized in terms of the complete inability to cope with stress and resultant symptoms such as chemical dependency and emotional disability.

Howell and Schroeder report that physicians who are subject to impairment have several distinct personality characteristics. The foremost of these is their devotion to their occupation (i.e. they are highly committed). The physicians at risk for impairment devote extraordinarily long hours to their job, attempt to accomplish too much in too little time, are unable to relax, and are urgent and impatient with themselves and others. Their psychological characteristics are

thought to include their high expectations of themselves, high need for approval from their peers, and an obsessive overachieving style. These characteristics and others have been described as the "overwork syndrome" (Spears, 1981) and the Type A behavior pattern. Howell and Schroeder comment that there is a need for these signs and symptoms of stress to be recognized early so that interventions can be made either with the individual or their environment to alter these problematic characteristics. One possible means for recognizing a physician's high level of commitment with and without the accompanying Type A behavior pattern is Doty and Betz's (1981) Work Attitudes Questionnaire. This questionnaire differentiates between highly committed individuals and highly committed Type A individuals.

The preceding models of professional development and levels of stress in physicians are useful in that they help to organize the thinking of researchers and medical education administrators involved with these issues. Brent's model is most useful in that it provides broad, clearly descriptive characteristics for a physician's professional development. Howell and Schroeder's (1984) model, despite its intuitive appeal, suffers from the conceptual problems of previous stress theorizing. The foremost of these is the authors' subtle but varied definition of stress. They appear to shift their view of stress from environmental circumstances and events to that of responses and symptoms as they change levels within the model. This leads to the lexical confounding that has been present throughout much of the stress literature.

Howell and Schroeder's attempt to develop a categorization for physicians at risk for impairment appears to be intuitively useful. Yet it suffers from being based on little empirical research. The literature on physician impairment is for the most part descriptive. To date, no predictive models for impairment have been developed. More useful have been the proposals for identifying the intrinsic stresses of the medical training environment (e.g. McCue, 1982). A promising approach to examine these intrinsic stresses is provided by instrumentation such as Osipow and Spokane's (1983) Occupational Environment Scales. Such scales, in addition to assessing the unique environmental stresses such as a physician's being "on call", can provide a meaningful evaluation of the inherent stresses of the occupational environment. Being "on call" and the long duty hours associated with call have been addressed as one of the most salient sources of occupational stress for young physicians (Ashen and Rahan, 1983).

Physicians and Sleep Loss. One of the greater sources of stress for interns and residents are the long hours they are on duty. The lengthy duty hours of physicians, particularly in internship and residency, are well known (see Gillanders and Heiman, 1971). Being "on call" at the hospital every third or fourth night typically entails the physician's being in charge of patient care throughout the night. The next morning the physician must begin normal daily duties. The consequences of sleep deprivation have been cited as one of the most stressful aspects of an intern's and resident's training (Friedman, Bigger,

and Kornfield, 1971; Friedman, Kornfield, and Bigger, 1973; Wilkinson, Tyler, and Varey, 1975; Chamberlain, 1980; and Asken and Rahan, 1983).

Asken and Rahan (1983) have reviewed the literature on the performance of the sleep deprived physician. Noted were how previous studies of nonphysicians have pointed out a variety of performance changes associated with sleep deprivation (e.g. impaired concentration). Most surprising is Asken and Rahan's report that they were only able to find six studies specifically pertaining to sleep deprivation with physicians. These studies used very different methodologies to address the performance problems of a sleep-deprived physician. In light of the sparse data, they concluded that "it appears that the performance of sleep-deprived physicians is likely to show deficits" (p. 387).

However, what these deficits may be for an intern or resident can only be inferred in a general way from the sleep deprivation literature. Though one can infer that the fatigue developing from being sleep-deprived is a source of stress for interns and residents, the specific tasks in which a sleep-deprived physician experiences difficulty are not clearly discernable. Considering the potential life-saving duties a hospital-based physician is regularly involved with, it appears that there is a gap in the scientific literature pertaining to the effects and degree of strain resulting from an intern or resident being sleep-deprived. Within the following study an attempt has been made to delineate specific reactions to call. This was accomplished by including a number of Likert-scaled items that reflect commonly cited problems associated with a physician being "on call".

Stresses in Medical Training. Attempts to more directly measure the stresses of internship and residency have, for the most part, focused on the internship experience because it is considered to be the period of greatest stress for physicians in training. Valko and Clayton (1975) used an interview technique to identify the consequences of a one year internship in a variety of specialities. Their finding that thirty percent of their sample was depressed during the internship was used in support of the conclusion that internship is stressful. Unfortunately, they used very general criteria for defining depression and primarily attend to the length and characteristics of depression. To a lesser degree they examine the environmental characteristics of an internship and the individual personality variables that may contribute to depression.

Scott (1983) has more explicitly examined the sources and levels of stress experienced by family practice physicians while attempting to examine the contributions of personality traits. She interviewed sixty family practice physicians and an unspecified number of family practice residents. In addition to the interview she asked them to complete a questionnaire composed of standardized psychometric instruments (e.g. a "Burnout" inventory and a measure of personality characteristics). Her results indicated that personality variables were a particularly potent source for predicting strain in female physicians. No clear pattern of personal or professional stresses could be identified for the practicing physicians, though Scott believes her findings support the idea that the

perceptions of stresses are sex-linked. For example, women experienced their work as more stressful than men.

Despite the fact that she studied physicians already in professional practice, the conceptual framework she employed makes the study useful in considering the stresses of training. Contributing to the importance of this study was the attention paid to of the complexity of the issues involved in stress research. This complexity arises out of the intricate interplay between stress, the consequences of stress (i.e. strain and illness), and the plethora of mediating variables that have been postulated. Another strength in Scott's study was that it attempted to examine the mediating effects of personality variables and several demographic variables on the stresses reported by family practice physicians. For instance, there were differences in what men and women physicians perceived as stresses. The most significant source of stress was emotional exhaustion, the product of a great amount of patient contact. The physicians' perceived control over their work situation appeared to be the most significant coping mechanism. Though her operationalization of control as a coping mechanism is clearly within the framework of the following study, what Scott labels emotional exhaustion is more accurately labeled a strain symptom with the specific stress being the great amount of patient contact. Overall, Scott saw her results as supporting Kobasa's (1979) construct of "hardiness". That is, physicians who (1) had a more favorable assessment of themselves, (2) felt a sense of accomplishment, (3) were committed to their



occupation, and (4) rated fewer events as having a negative impact on them, reported fewer strain symptoms.

Another study focusing on the personality characteristics and coping styles of physicians is Donnelly's (1979) study of interns. She examined the effect of the intern's stage of ego development and coping style (using Lazarus's taxonomy of palliative and non-palliative coping) on ratings of clinical performance. Donnelly concluded that the subjects perception of the environment, their coping behaviors, and their general reactions to internship were a function of ego development. She also indicated that the net result of one's level of ego development and other mediating variables could be seen in symptoms such as exhaustion, depression, loss of outside interests, and chronic tension.

Donnelly identified several stress areas in internships through interviews with internal medicine, family medicine, and pediatric interns. The salient sources of stress included: long duty hours; being "on call"; sleep loss; role responsibility; and lack of time for self, family, and friends. She concluded that all interns regard the internship as stressful. The perceived stress was a product of both the training experience and the loss of personal and family time. This conclusion, though extremely noteworthy, was drawn solely from interviews with the physicians. It would be helpful to empirically assess the relative contributions of each of these sources of stress. For example, does work overload and a poor social support system result in a greater number of strain symptoms than either does alone? Problems such as this

formed the basis of this dissertation and furthermore influenced the selection of instrumentation that measure environmental stress characteristics like role responsibility (i.e. Osipow and Spokane's (1981) Occupational Environment Scales).

The attention paid to the stressfulness of the internship has perhaps been most thoroughly examined in two major studies of pediatric interns (Werner, Adler, Robinson, and Korsch, 1979; and Adler, Werner, and Korsch, 1980). These studies examined factors such as attitudes and interpersonal skills related to a pediatric internship. Their studies are particularly noteworthy for the large sample size (N=94) and the authors' examination of several cohorts of interns. Adler et al's primary interest was to assess changes in attitudes, self-confidence, coping, and sources of stress that occur between the beginning and end of internship.

The unique contributions of these studies were 1)their repeated measures and cross-sectional design; 2)the fact that the authors identified potential sources of stress; and 3)that they examined changes that occur over time. It is unfortunate that there was no evidence presented for the psychometric integrity of their rationally developed questionnaire, as this would have made the results more powerful. However, as these studies stand they present further impetus for examining the internship and residency period in terms of occupational stress, strain, and stress resistance resources. It was also unfortunate that the authors looked only at the simple effect of time on these variables rather than the complex interplay between these variables over time.

An attempt to look strictly at affective changes during the internship has been made by Uliana, Hubbell, Wyle, and Gordon (1984). Concluding that previous investigations of the affective changes associated with internship have lacked psychometric integrity, the authors used standard psychometric instruments (i.e. the Profile of Mood States and the Self-Rating of Depression Scale) taken at four month intervals to identify the mood changes associated with internship. In contrast to other studies (e.g. Valko and Clayton, 1975), only the level of anger-hostility changed significantly over the course of the internship. Depression and fatigue factors did not increase or decrease during the year. Uliana et al conclude by calling for the increased use of standardized psychological instruments with proven validity and reliability in research on physician training.

Throughout the course of reviewing the preceding studies it has become apparent that the internship experience has received more attention than the entire residency period. While this has lead to greater knowledge about internship and has prompted the call for increased scientific rigor in the study of a physician's internship, the focus solely on internship does not provide a complete picture of the developing physician. Brent's (1981) epigenetic framework has prompted further research by its conceptualization of the five developmental tasks of residency.

Gerber (1983) has been one of the first to take Brent's broader perspective on the professional development of physicians. His book

provides detailed interviews with medical students, interns, and residents. In fact, he followed some of them through the entire course of their professional training to gather the interview data. The interview material was presented with available research literature that was used to support the interview findings. Gerber's interviews have provided a basis for the further empirical investigation of the professional development of physicians.

Alexander (1983) and Alexander, Jonas, and Monk (1984) have taken this step in their examination of a very large sample (N=155) of family practice residents and faculty. Alexander et al chose three relatively new psychometric instruments (i.e. Osipow and Spokane's (1981) Occupational Environment, Personal Strain, and Personal Resources Questionnaires) to assess the stresses, strain, and resistance resources of their subjects. Despite the relatively recent development of these instruments, Osipow and Spokane (1981) have provided promising reliability and validity data for their use. These studies replicated Osipow and Spokane's reliability and validity data and additionally, provided confirmatory evidence for 12 of the 14 hypothesized subscales. They used these instruments as the dependent variables and chose occupational level (i.e. first, second, or third year of residency), age, gender, minority status, marital status, total patient load, and total hours worked as his independent variables.

Both investigations found no significant differences between resident year groups (i.e. PGY-1, PGY-2, and PGY-3) and faculty on full

scale measures of stress or strain. Yet subscale differences between first year residents and faculty were detected on four of the twelve subscales. They also report that demographic factors such as sex and marital status differentiated between the sources of stress and strain. For example, single physicians reported greater levels of occupational stress and strain than did married physicians.

These studies stand out for their use of standardized psychometric instrumentation in the examination of the stresses associated with physician training. Alexander et al take the unique position that the stress of a physician's training can best be viewed as demands on six interrelated occupational roles, as opposed to the predominant view in the health psychology literature of stressors being measured in terms of "life events". Though life events have been a useful means of characterizing stress in general, Masuda and Holmes (1978) finding that medical residents were among the groups with the lowest annual frequencies of life events casts some doubt on the life events scale as a useful measure, particularly with interns and residents. A more specific operationalization of stress as a feature of the occupational environment makes intuitive sense and provides a more meaningful measure of stresses. This is not to say that the use of life events are irrelevant. While they provide a measure of stress from the larger psychosocial environment, occupational stress provides a more intimate look at one important part of a person's psychosocial environment.

Another strength in Alexander et al.'s studies can be seen in that their analyses of the data collected began to take into account the complex interrelationship that health psychologists have postulated to exist between stress, strain, and the numerous intervening stress resistance variables. Furthermore their results can be examined in light of the impressionistic conclusions of previous authors that first year residents perceive more stress than any other residents. Such impressions were not apparent in Alexander et al.'s results. The reports of occupational stress did not differ across years of residency. Instead, what was discovered was that coping resources are less apparent in the first year resident than at any other year. Their analyses demonstrated that coping resources increase through the course of a physician's training and one's coping resources contributed to differences between occupational levels more so than did the level of stress experienced.

Results such as these suggest further detailed investigation into the stress-strain relationship in physicians. In particular one might more carefully explore the contributions of individual differences to the coping responses and/or strain experienced by resident staff physicians. In such analyses it would be expected, based on the work of Donnelly (1979) and Fleishman (1984), that personality traits may also contribute to the strain symptoms manifested and the coping patterns that developing physicians endure.

Summary and Conclusions. In the preceding section the literature on stress(es) associated with internship and residency training was

reviewed. Overall, it appears that this literature is just beginning to utilize the knowledge base from the social sciences in the study of stress and its consequences. Much of the literature up to this point has relied on descriptive data from very small samples in attempting to understand the impact of occupational stress on the professional growth of physicians. Taken with the very simple methods of data collection, the results are little more than impressionistic. However, these results do provide an impetus for further study. Clues as to the complex interplay of a number of variables has begun to be addressed by Alexander (1984) and Ulina et al. (1984). What appears to be needed at this time are methodologically and conceptually stronger studies that can begin to examine the issues raised by these previous studies. Such an investigation would examine the occupational stresses in a physician's training, the resulting strains, and the resistance resources such as coping style and social support system, as well as other sources of individual differences (e.g. psychological adjustment) that are in evidence during a physician's post-graduate training. The present investigation attempted to take into account the previous findings from studies in medical education while at the same time using a more sophisticated approach to analyzing the problem of stress in a physician's training.

### Specific Research Questions

In light of previous research findings in the medical education and psychological literature, the following research questions formed the basis of the present investigation:

1. Which of Osipow and Spokane's occupational stress factors (i.e. Role Overload, Role Insufficiency, poorly defined Role Boundaries, Role Ambiguity, Role Responsibility, and aspects of the Physical Environment) best describes a pediatric physician's internship and residency?
2. What is the relationship between occupational stress and occupational strain in the pediatric internship/residency?
3. What are the relative contributions of stress resistance resources (i.e. commitment, coping, and social support), demographic variables, and psychological adjustment in mediating the relationship between occupational stress and strain?
4. What are the best predictors of occupational stress, strain symptomatology, and regressive coping style during a physician's training?



## CHAPTER III

### METHOD

The following sections provide a detailed description of the subjects, procedures, instrumentation, hypotheses, and analyses employed in this research.

#### Subjects

Fifty-six interns and residents in Pediatrics at a large children's hospital served as the subjects in this investigation. The pediatrics program is of three years duration, the first year of which is called the "internship" and the subsequent two years are known as the "residency". The sample was composed of 30 males and 26 females who ranged in age from 23 to 30. There were approximately an equal number of subjects in each year of the program. That is, there were 19 interns, 19 second year residents, and 18 third year residents in the sample. The subjects have all graduated from a number of medical schools throughout the United States. As detailed below, all subjects who participated in this survey did so voluntarily.

#### Procedure

The study was run in two phases. Phase I consisted of piloting the questionnaire packet with a group (N=8) of interns and residents who

were training in a variety of specialities at four other hospitals. They were asked to indicate the total amount of time it took to complete the questionnaire. They were also asked to provide the investigator with feedback regarding the questionnaire and cover letter (e.g. clarity of directions and readability of the instruments). Pilot study data were not used in subsequent analyses. Prior to running the pilot subjects, a research proposal was submitted to the Graduate School of Loyola University and to the Institutional Review Board of Loyola for approval. Additionally, approval for this project was sought from the the Institutional Review Board of the hospital.

Phase II of the study involved the solicitation of the targeted group of interns and residents. Subjects were contacted through the hospital mail system. Each intern/resident has a mailbox through which he/she received the questionnaire packet. Each questionnaire packet contained a personalized cover letter (see Appendix A) and an informed consent form (see Appendix B), along with seven research instruments. The cover letter was used to convey the importance and the goals of the project, and the approximate time required to complete the assessment instruments. The subjects' cooperation was encouraged and confidentiality was assured. In the cover letter subjects were asked to complete the research questionnaires and place them in an envelope to be returned through the hospital mail system to a mailbox assigned to this project. Subjects were informed that the completed questionnaires and informed consent form would only be handled by the investigator. No other person

would have access to the raw data. Furthermore, nowhere in the data reduction process would their names appear. Finally, the cover letter explained the provisions for debriefing regarding the results. Subjects were informed that a debriefing letter from the investigator would be mailed after the results of the study had been analyzed.

A followup procedure was employed to maximize the return rate of the questionnaires. This procedure was a variation of the Total Design Method developed by Dillman (1978). One week after the initial mailing of the research packets, a followup letter was sent through the hospital mail system to all subjects thanking them for their cooperation and requesting those subjects who had not completed the questionnaire to do so and to return it. Approximately two weeks later, a second questionnaire packet was sent to the 29 subjects who had not responded. A different cover letter was utilized. It informed nonrespondents that their questionnaire had not been received, and appealed to the subjects to take the time to respond to the enclosed questionnaire. Three weeks later a final questionnaire packet was sent to the 16 subjects who had not responded. This contained another personalized cover letter soliciting the subjects' cooperation.

Each of the research packets contained a code number that was randomly assigned to an intern's or resident's name on a master list. The master list containing this information was only handled by the principal investigator; thus, the subjects could be assured that no one would connect their identification number with their name. Only a subject's

code number was attached to the data when it was transferred to Loyola's computing system.

The questionnaire packet contained an informed consent form in accordance with the Institutional Review Board procedures of Loyola University. In order to participate in this study interns and residents were required to sign the consent form (see Appendix B). The informed consent forms were separated from the returned questionnaires and kept apart from the questionnaires.

The order of presentation of the instruments was counterbalanced to control for test sensitization.

Debriefing. Once the data had been analyzed by the principal investigator, a debriefing letter to the subject's was composed. The letter included a detailed explanation of the hypotheses of the study and the degree to which the results supported them. The possible meaning of the results was then explored. Finally, individual debriefing for subjects was offered.

#### Instrumentation

There were seven instruments in addition to the research questionnaire included in each research packet. These included: Osipow and Spokane's (1983) Occupational Environment Scales; Kobasa's (1982) Symptoms of Strain Questionnaire; Doty and Betz's (1981) Work Attitudes Questionnaire; Osipow and Spokane's (1983) Personal Resources Questionnaire; Kobasa's (1982) Regressive Coping Checklist; a Social Support System questionnaire developed by Billings, Cronkite, and Moos (1983); and Lanyon's (1970) Psychological Screening Inventory.

Research Questionnaire. The research questionnaire was developed by the investigator (see Appendix C). It solicited demographic information as well as raised questions about the length of the subject's work week, nights per week "on call", and Likert scale items related to the subject's experiences with being "on call". These questions attempted to solicit the self-reported responses to the intern and resident's call schedule. The questions were based on the work of Ashen and Rahan (1983), Brent (1981), Friedman, Kornfeld, and Bigger (1973), and Wilkinson, Tyler, and Varey (1975), which have attempted to identify the unique stresses associated with an intern's and resident's "on call" schedule. The items developed for this study were based on refinements of the questions posed by the aforementioned authors.

Occupational Environment Scales. Osipow and Spokane's (1983) Occupational Environment Scales (see Appendix D) assess aspects of stress in the work environment. The instrument consists of 60 items (e.g. "I feel competent in what I do") and provides indexes on six aspects of occupational stress which the authors believe are common to all occupational fields. Subjects responded to each of the scale items on a five point Likert scale (1 for Rarely or Never, 2 for Occasionally, 3 for Often, 4 for Usually, and 5 for Most of the Time).

The six aspects of occupational stress identified in the Occupational Environment Scales (OES) are labeled Role Ambiguity, Role Overload, Role Insufficiency, Role Boundaries, Role Responsibility, and characteristics of the Physical Environment. Table 1 presents the six subscales and a summary of their respective contents.

Table 1

Occupational Environment Scales


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Subscale	Content
Role Overload	Measures the extent to which job demands exceed resources (personal and institutional), and the extent to which one is able to accomplish the expected workload.
Role Insufficiency	Measures the extent to which one's training and education, skills, and experience are appropriate to the work being done.
Role Ambiguity	Measures the extent to which the priorities, expectations, and evaluation criteria are clear to the employee.
Role Boundary	Measures the extent to which one is experiencing conflicting role demands and loyalties at work.
Role Responsibility	Measures the extent to which one has, or feels a great deal of responsibility for the performance and welfare of others on the job.
Physical Environment	Measures the extent to which one is exposed to high levels of environmental toxins or extreme physical conditions.

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From: Osipow and Spokane, 1983.

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A subject's score in each of the six subscales of the OES is determined by summing the ten items which compose the subscale (with appropriate attention to the reverse keyed items). A total occupational stress score is calculated by the summation of the six subscale scores. The maximum range of scores for each subscale is 10 to 50, and the total OES score ranges from 60 to 350.

The measure of internal consistency reported by Osipow and Spokane (Chronbach's  $\alpha=.88$ ) is based on a sample of 549 subjects. The authors have concluded that the OES full scale score is internally consistent for research purposes. Two week test-retest reliability was .90 with reliabilities of the subscales ranging from .74 to .91. Osipow and Spokane (1983) have developed normative data for the OES based on the 549 subjects from diverse occupational fields. Baldwin (1981) provided some evidence for construct validity for the OES. He found a strong inverse relationship between occupational stress, as measured by the OES, and occupational satisfaction. Alexander (1983) used the OES with interns, residents, and their faculty supervisors. His results suggested that the OES was useful in a medical context with medical personnel.

Symptoms of Strain. The instrument used to assess the strain experienced by interns and residents was Kobasa's (1982) Symptoms of Strain measure (see Appendix E). This instrument consists of a list of sixteen physical and mental symptoms commonly associated with stress. A subject indicates on a five point Likert scale the degree to which he/

she experienced each of the sixteen symptoms during the previous month (1 for Not at All; 2 for A Little - Once per Month; 3 for Sometimes - 2 or 3 Times per Month; 4 for Quite a Bit - 4 to 6 Times per Month; and 5 for Very Often - 7+ Times per Month).

Subject's strain scores are determined by the sum of all of his/her ratings on the instrument. Kobasa (1982) reported that the psychometric properties of this instrument were based on the responses of 75 adult male professionals. The internal consistency of the Symptoms of Strain measure has been reported to yield a coefficient alpha of .85. Two week test-retest reliability was .80. The strain questionnaire has been significantly (but moderately) correlated with reports of physical illness ( $r=.35$ ;  $p<.05$ ).

Work Attitudes Questionnaire. Three separate instruments were used to assess the stress resistance resources of interns and residents. The first of these instruments was Doty and Betz's (1981) Work Attitudes Questionnaire (see Appendix F) which was used to measure the degree of intern's and resident's career commitment. This instrument is composed of 45 items which form two subscales the authors label as the "Commitment" and "Health". The 23-item Commitment subscale was designed to measure high and low degrees of career commitment. The 22-item Health subscale was designed to distinguish between two types of highly committed individuals (i.e. the "workaholic" or Type A individual, and the Type B individual who is highly committed yet who manages to lead a "balanced, psychologically healthy life"). Each item of the subscales



is responded to on a five point Likert scale (1 for Strongly Disagree; 2 for Disagree; 3 for Uncertain; 4 for Agree; and 5 for Strongly Agree).

Calculating totals for the Commitment and Health subscales involves the summation of the subject's responses with appropriate attention to the reverse keyed items. Scores on the Commitment subscale range from 23 to 115 and on the Health subscale range from 22 to 110. Total Work Attitude Questionnaire (WAQ) scores range from 45 to 225.

Internal consistency is reported by Doty and Betz (1981) to be .80 for the Commitment subscale, .85 for the Health subscale, and .90 for the total WAQ. There are no reports for test-retest reliability. The authors reported WAQ and subscale concurrent validity correlations with other measures of occupational commitment ranging from .29 to .62. For example, total WAQ score was strongly correlated with hours of work per week and with Greenhaus' (1971) Career Salience scale. Construct validity has been supported by the work of Doty (1980)(see Doty and Betz, 1981).

Doty and Betz suggest that a score above 69 on the Commitment subscale be used to identify highly committed individuals. Subjects who score above 69 on the Commitment subscale and who score higher than 66 on the Health subscale are viewed as Type As (i.e. a "workaholic"). Those who score above 69 on the Commitment subscale and who score equal to or less than 66 on the Health subscale are described as highly committed and leading psychologically healthy lifestyles.

Personal Resources Questionnaire and Regressive Coping. Coping was assessed via Osipow and Spokane's (1983) Personal Resources Questionnaire (PRQ) and Kobasa's (1982) Regressive Coping checklist. Osipow and Spokane's instrument (see Appendix G) was used to measure the degree of positive coping by the subject. Coping behaviors that are thought to constructively facilitate a reduction in stress have been used to develop the four subscales of the PRQ. These four subscales are titled Recreation, Self-Care, Social Support and Rational/Cognitive Coping. Table 2 presents the four subscales and a summary of their respective contents.

Subjects responded to each of the 40 items on a five point Likert scale (1 for Strongly Disagree; 2 for Disagree; 3 for Uncertain; 4 for Agree; and 5 for Strongly Agree). A subject's score in each of the four subscales of the PRQ was determined by summing the ten items which compose the subscale, with appropriate attention to the reverse keyed items. A total coping score could then be calculated by the summation of the three subscale scores. The possible range of scores for each subscale is 10 to 50 and the total PRQ score can range from 40 to 200.

The measure of internal consistency reported by Osipow and Spokane was based on the same 549 subjects as studied with the Occupational Environments Scales. The PRQ yielded an internal consistency coefficient of .83 leading the authors to conclude that the PRQ full scale score "is sufficiently consistent for research purposes" (Osipow and Spokane, 1983). Two week test-retest reliability was .88 with reliabilities of

Table 2

Personal Resources Questionnaire

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Subscale	Content
Recreation	Measures the extent to which one makes use of or derives pleasure and relaxation from regular recreational activities.
Self-care	Measures the extent to which one regularly engages in personal activities that may result in the reduction or alleviation of chronic stress.
Social Supports	Measures the extent to which one feels support and help from those around him/her.
Rational-Cognitive Coping	Measures the extent to which one possesses and uses cognitive skills in the face of work related stress.

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From: Osipow and Spokane, 1983.

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the subscales ranging from .78 to .89. Osipow and Spokane have developed normative data for the PRQ. They have furthermore provided some evidence for construct validity for the PRQ. Alexander (1983) used the PRQ with interns, residents, and their faculty supervisors. His results suggest that the PRQ was useful in this context.

Kobasa's (1982) Regressive Coping instrument is a 14 item checklist which attempts to assess what she titles "regressive coping" in a respondent (see Appendix H). Regressive coping is "an attempt to deny, minimize, or get away from a stressful situation" (Kobasa, 1982, p.712). Kobasa reported that the items in this checklist were derived from Maddi's (1967) personality theory and, more broadly, from existential theory. The internal consistency alpha for the regressive coping items was reported to be .74. Kobasa reported that this instrument was significantly correlated with strain symptomatology ( $r=.34$ ,  $p<.005$ ), a measure of alienation ( $r=.20$ ,  $p<.01$ ), and stressful life events ( $r=.30$ ,  $p<.005$ ).

In Kobasa's research, the subjects were simply required to check off which items (identified as "Coping Strategies") they used when encountering stress. For the purposes of this study, the subjects were required to respond to how often they rely on each coping strategy using a 5-point Likert scale (1 for Not at All; 2 for A Little; 3 for Sometimes; 4 for Quite a Bit; and 5 for Frequently). It was concluded that this change in the response strategy would provide interval data for analysis.

Quantity and Quality of Social Support. To assess the quantity of the subject's social support system an instrument developed by Billings, Cronkite, and Moos (1983) was utilized (see Appendix I). The quantitative aspect of a subject's social relationships was assessed by asking a subject about the number of friends they had (1 item), their network contacts (determined by the sum of 5 items), and the number of close relationships they had (determined by the sum of 2 items). Each question required a simple numeric response from the subject. Billings et al (1983) reported that each of these factors differentiated a group of clinically depressed from normal subjects: friends ( $\underline{t}=7.06$ ,  $\underline{p}<.01$ ), network contacts ( $\underline{t}=4.68$ ,  $\underline{p}<.01$ ), and close relationships ( $\underline{t}=7.32$ ,  $\underline{p}<.01$ ).

The qualitative aspects of the subject's social networks were assessed by three scales: the Quality of a Significant Relationship scale (from the Health and Daily Living Form; Moos et al, 1984), the Family Support scale (from the Family Environment Scales), and the Work Support scale (from the Work Environment Scales). The quality of significant relationships subscale is composed of 6 items which Billings et al adapted from Spanier (1976) (see Appendix J). Subjects respond on a 5-point Likert scale to the items which were designed to describe aspects of a current relationship. Internal consistency data is reported to yield a coefficient alpha of .72. A subject's total score is determined by the sum of the 6 items. Billings et al reported that their measure significantly differentiated a group of clinically depressed from normal subjects ( $\underline{t}=9.36$ ,  $\underline{p}<.01$ ).

The Family Support subscale (see Appendix K) was adapted from the Family Environment Scale (Moos and Moos, 1981). Specifically three subscales are utilized: Cohesion (the degree to which family members are helpful and supportive of each other); Expressiveness (the extent to which family members are encouraged to express their feelings openly and directly); and Conflict (the extent to which anger, aggression, and conflict are openly expressed in the family). These subscales totaled 27 true-false items. The subscales are calculated by the addition of keyed responses as presented in Moos and Moos (1981) except for the Conflict subscale which is scored in reverse. And the total support score is the sum of the three subscales (i.e. Cohesion, Expressiveness, and Conflict).

Internal consistency data were reported (see Holahan and Moos, 1981) to yield a coefficient alpha of .89. Two month test-retest reliabilities were reported as .86 (Cohesion), .73 (Expressiveness), and .85 (Conflict). Moos and Moos (1981) report 12-month profile stability (i.e. the mean subscale reliability coefficient) as .71.

Work Support was assessed from three subscales of the Work Relationships Index (Moos, 1981) (see Appendix L). These three subscales totaled 27 true-false items. The three subscales are titled Involvement (the extent to which subjects are committed to their job), Peer Cohesion (how friendly and supportive the subjects perceive the others at work), and Supervisor Support (the extent to which management is perceived to be supportive and encourages employees to be mutually supportive).

Internal consistency is in the moderate to high range ( $\alpha = .78$ ) (see Holahan and Moos, 1981). One month test-retest reliabilities are reported as .83 (Involvement), .71 (Peer Cohesion), and .82 (Supervisor Support).

Holahan and Moos have reported that the Work Support index has been significantly correlated with clinical signs of depression in employed men and women (partial  $r = -.15$ ,  $p < .05$ ; and partial  $r = -.27$ , respectively) and with psychosomatic symptoms in employed men (partial  $r = -.18$ ,  $p < .05$ ). Billings et al (1983) found the index to differentiate between heterogeneous groups of depressed and nondepressed individuals ( $t = 3.70$ ,  $p < .01$ ). The subscales were calculated by the addition of keyed responses as presented in Moos and Moos (1981). And the total support score was the sum of the three subscales (ie. Involvement, Peer Cohesion, and Supervisor Support).

Psychological Screening Inventory. Finally, to control for individual differences among the subjects, Lanyon's (1970) measure of psychological adjustment, the Psychological Screening Inventory (PSI), was completed by the subjects (see Appendix M). Investigators such as Gots (1982) and Alpert (1983) have found the PSI to be a valid instrument for assessing individual differences in samples of normal individuals. Fleishman (1984) has noted that knowledge of personality characteristics is essential to an understanding of the coping patterns of individuals.

The original five subscales of the PSI were developed by internal consistency methods. A later factor analysis of the PSI using 150 col-

lege students, by Johnson and Overall (1973), produced three subscales labeled: Introversion, Social Maladjustment, and Emotional Maladjustment. Table 3 presents the three subscales and a summary of their respective contents.

The PSI consists of 130 true-false items. Internal consistency coefficients of the subscales are reported by Lanyon (1970) as ranging from .51 to .85. One month test-retest reliabilities range from .66 to .93. Totals for each subscale were calculated according to the scoring criteria of Lanyon (1970).

Conclusion. These instruments (with the exception of the research questionnaire) were selected on the grounds that they: 1) supply factors that are meaningfully related to the constructs under consideration; 2) have adequate reliability and validity as psychometric instruments; and 3) can be completed in a brief period of time. The last of these criteria was considered essential in light of the extraordinary time demands created by a physician's internship and residency.



Table 3

Psychological Screening Inventory

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Subscale	Content
Introversion	Measures verbal expressiveness and orientation to interpersonal relationships.
Social Maladjustment	Measures feelings of anger and frustration and social nonconformity.
Emotional Maladjustment	Measures lack of self-confidence, feelings of isolation, somatic complaints, and neurotic discomfort.

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From: Johnson and Overall, 1973.

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### Hypotheses and Statistical Analyses

The study proposed here was conceptualized by Campbell and Stanley (1963) as an exploratory, one group case study. That is, one group of pediatric interns and residents within the population of all interns and residents was sampled. Several descriptive and analytical hypotheses will be tested. The following section presents both these descriptive and analytical hypotheses and the proposed statistical procedures for examining them.

#### Descriptive hypotheses:

1. On the premise that interns and residents are exposed to higher than normal levels of stress, the obtained OES subscale scores (i.e. role overload, role insufficiency, role boundary, role ambiguity, role responsibility, and the physical environment) and total OES score will be significantly higher than the norm group's scale means and overall mean reported by Osipow and Spokane (1983). This hypothesis was tested by first statistically describing the results from the sample (i.e. the measures of central tendency); comparing the mean index and full scale OES scores from the sample with those from the normative group via a two-tailed t-test; and then contrasting the subscale intercorrelations of the sample with the normative group.
  - a) There will be significant differences in OES subscale scores between the different training levels (i.e. PGY-1, PGY-2, and PGY-3). Interns will score highest on all

OES subscales.

- b) There will be a significant correlation between the Reactions to Call index and the OES subscales and OES total score. The Reactions to Call index will be most significantly correlated with the role overload and role insufficiency subscales of the OES.
2. There will be a significant relationship between the overall measure of work stress and strain symptomatology. This relationship was tested by the use of the Pearson product moment correlation ( $r$ ).
3. There will be no significant difference between the numbers of Type A and non-Type A individuals within the sample. This hypothesis was tested by utilizing Doty and Betz's (1981) method of classifying Type A and non-Type A individuals (based on a subject's score on the subscales of the WAQ) and then employing a Chi-square goodness of fit test).

Analytical hypotheses:

4. Strain symptomatology was tested by three hypotheses:
  - a) Differences in strain symptomatology will be a function of the significant interaction of coping scores (i.e. high and low PRQ full scale scores) with the stress scores (high and low OES full scale scores). This hypothesis was tested by a 2X2 Analysis of Covariance (ANCOVA) procedure. Covariates will include the Psychological Screening Inventory factors plus the measure of regressive coping.

- b) Differences in strain symptomatology will be a function of the significant interaction of commitment style (i.e. Type A or Type B) with the stress scores (high and low OES full scale scores). This hypothesis was tested by a 2X2 ANCOVA procedure using the same covariates as above.
- c) Differences in strain symptomatology will be a function of the significant interaction of the quantity and quality of the social support network (i.e. total high quantity and quality index versus remaining quantity and quality index) with the stress scores (high and low OES full scale scores). This hypothesis was tested by a 2X2 ANCOVA procedure using the same covariates as above.
5. The most powerful predictors of high amounts of occupational stress will be determined by use of a multiple regression procedure. It was predicted that the most powerful predictors of occupational stress would be Role Overload (from the OES), the Reactions to Call index, commitment (from the WAQ), regressive coping, Social Maladjustment (from the PSI), and the number of hours worked in the preceeding week (from the research questionnaire).
6. The most powerful predictors of high amounts of strain symptomatology will be determined by use of a multiple regression procedure. It was predicted that foremost among these would be regressive coping, commitment (from the WAQ), individual subscale and total Occupational Environment Scale measures, and

(  
the number of hours worked in the preceeding week (from the research questionnaire).

7. The most powerful predictors of high amounts of regressive coping will be determined by use of a multiple regression procedure. It was predicted that foremost among these will be commitment (from the WAQ), PRQ subscale scores, the quantity and quality of social support (from the social support questionnaire), and the OES subscale scores.
8. The dependent variable psychological adjustment was explored from three viewpoints by the use of an Analysis of Variance (ANOVA):
  - a) Differences in strain symptomatology will be a function of the significant interaction of adjustment variables (subscale scores from the PSI). It is predicted, for example, that the Introversion and Emotional Maladjustment subscales would significantly interact to account for differences in strain symptomatology.
  - b) Differences in the Regressive Coping index will be a function of the significant interaction of the Introversion and Emotional Maladjustment subscales.
  - c) Differences in the Reactions to Call index will be a function of the significant interaction of the Introversion and Emotional Maladjustment subscales.

## CHAPTER IV

### RESULTS

#### Overview

The results of this study are organized in five sections. The first section describes the procedures used for the treatment of missing data. The second section presents the demographic characteristics of the sample. The third section contains the tests of the eight hypotheses that formed the basis of this investigation. Supplementary (a posteriori) analyses comprise the fourth section of this chapter. The fifth section summarizes the findings of the investigation. Tables will be provided where appropriate in all sections.

#### Treatment of Missing Data

In order to accurately analyze the results from this investigation, a priori criteria were developed to treat missing data. For the Occupational Environment Scales (OES) and the Personal Resources Questionnaire (PRQ), when greater than one item per scale was missing, the scale was coded as missing. Where one item was missing, the missing value was calculated as the subject's average subscale score (decimals were rounded off). These criteria were developed on the basis of Alexander's (1983) use of these instruments with family practice residents. For the Work Attitudes Questionnaire (WAQ), greater than two missing

responses resulted in a missing value for the scale. Less than two missing values were handled by calculating an average subscale score and using that value in the missing item. For the Reactions to Call (RTC) scale, the Quality of a Significant Relationship scale, the Regressive Coping scale, and the Strain Symptoms scale, more than one missing value resulted in a missing value for the particular scale. One missing item was calculated as an average of the other item responses. For the Work Support, Family Support, and Psychological Screening Inventory (where the response format was true-false) a subscale score was calculated as missing if more than two items for a subscale were missing.

#### Sample Demographic Characteristics

The demographic information questionnaire (see Appendix C) provided important data on the 47 respondents (84 percent of the population). There were 22 female and 25 male respondents in the sample. Their ages ranged from 23 to 30 ( $\bar{X}$ =26.91; S.D.=1.40). Approximately half of the pediatric interns/residents (51 percent;  $N=24$ ) reported their marital status as single. The remaining subjects (49 percent;  $N=23$ ) were married.

A number of self-reported characteristics of the resident were solicited via the demographic questionnaire. The mean number of hours worked by interns and residents was 81.17 (SD=16.635; range 44 to 112). A one-way Analysis of Variance (ANOVA) of total hours worked by the residents at each post-graduate year revealed a significant ( $p<.05$ ) difference between the post-graduate training years ( $F=3.77$ ; D.F.=2,44;

p=.03). A priori T-tests between the mean hours per week at each year revealed a significant difference in hours worked between first year ( $\bar{X}=89.71$ ,  $SD=16.76$ ) and third year ( $\bar{X}=74.17$ ,  $SD=17.08$ ) residents, though there is an apparent decrease in hours worked for the second year residents also ( $\bar{X}=81.64$ ,  $SD=12.18$ ).

The number of hours of sleep while "on call" and when sleeping at home was examined. Residents reported a mean of 2.5 hours ( $SD=.84$ ) of sleep while "on call" (range: 0.5 to 4.0). A One Way Analysis of Variance of the hours of sleep "on call" by post-graduate year indicated that the hours of sleep are significantly different between each year of the residency program ( $PGY1=1.97$ ,  $PGY2=2.46$ ,  $PGY3=3.06$ ;  $F=9.40$ ;  $D.F.=2,44$ ;  $p=.0004$ ). Self-reported hours of sleep at home averaged 7.1 ( $SD=.81$ ) and ranged from 5.5 to 9.0. An Analysis of Variance of the hours of sleep at home for each year in the residency program indicated no significant difference between each year of the program ( $F=0.19$ ;  $D.F.=2,39$ ;  $p=.83$ ).

Interns and residents were questioned about the extent to which they "moonlight". Less than half of the sample (41.3 percent) reported that they moonlight. Of these respondents, the mean number of times that they moonlight in a two month period is 3 ( $\bar{X}=3.056$ ,  $SD=2.29$ ), yet the range ran from zero to nine times in the preceding two month period.



### Tests of Hypotheses

Hypothesis 1: The first hypothesis tested to determine if there were significantly higher OES subscale and total scores for the sample than had been found with the normative sample (N=549) described by Osipow and Spokane (1983). Furthermore, this hypothesis predicted OES subscale differences between each year of the residency program and a significant positive correlation between the Reactions to Call index and the OES subscales, particularly Role Overload and Role Insufficiency.

Table 4 presents the means and standard deviations for the pediatric interns/residents and the Osipow and Spokane (1983) normative sample of employed adults from 103 diverse occupations. Two tailed T-tests were calculated to determine if the pediatric physician sample differs significantly from the normative sample on the six subscales and the full scale scores. The results of these T-tests are also presented in Table 4. It was assumed in making this comparison that both samples came from populations with common variances.

The T-test results indicate four of the six subscales differ significantly from the normative group. For pediatric residents, Role Overload, Role Responsibility, the Physical Environment and the total OES score are significantly higher than the normative group's scores. Pediatric residents reported significantly less Role Insufficiency than the normative group ( $t = -10.7535$ ;  $p < .001$ ). These findings partially confirm the hypothesis that all subscale scores would be higher for the sample.

Table 4

Occupational Environment Full Scale and Subscale Means and  
Standard Deviations for Pediatric Physicians and the Normative  
Sample with Follow-up T-tests

Subscale	PEDIATRIC RESIDENTS (N=47)		T-Value	EMPLOYED ADULT NORM GROUP (N=549)	
	Mean	SD		Mean	SD
Role Overload	31.53	6.51	6.2636*	25.49	7.79
Role Insufficiency	18.31	5.50	-10.7535*	27.03	10.08
Role Ambiguity	20.87	4.53	0.8834	20.28	6.67
Role Boundary	21.52	5.09	-1.5323	22.67	8.15
Role Responsibility	29.32	5.28	4.5344*	25.79	7.38
Physical Environment	22.11	6.45	3.9012*	17.40	7.45
Total OES Score	143.61	22.20	1.8239**	137.64	25.59

\*p < .005  
\*\*p < .05

An additional aspect of Hypothesis 1 concerned a comparison of the sample and normative group's OES subscale intercorrelations. The intercorrelations of the OES subscales are presented in Table 5. For this sample, the correlations appear to vary somewhat from those from the normative group. There does not appear to be a consistent pattern to the between sample variation in correlation coefficients.

Table 6 presents the means and standard deviations for each OES subscale at each post-graduate year (PGY) in the residency training program. One-way ANOVAs of each subscale by PGY were subsequently performed to test for differences between post-graduate years on each subscale. There are significant differences in Role Insufficiency ( $F=3.33$ ;  $D.F.=2,44$ ;  $p=.045$ ), Role Ambiguity ( $F=3.60$ ;  $D.F.=2,43$ ;  $p=.036$ ), and Role Responsibility ( $F=3.46$ ;  $D.F.=2,44$ ;  $p=.04$ ) across PGYs. A priori contrasts indicated that interns (PGY 1s) reported greater amounts of Role Insufficiency ( $p<.05$ ) and Role Ambiguity ( $p<.05$ ) than did the second and third year residents. Interns reported significantly less Role Responsibility than second and third year residents. Furthermore, it is important to note that the Role Boundary ( $F=2.09$ ;  $D.F.=2,43$ ;  $p=.13$ ) subscale approaches a statistically significant difference across post-graduate years. Finding that the Role Insufficiency and Role Ambiguity subscale scores are highest for interns provides partial support for part of Hypothesis 1. However, the finding of Role Responsibility being significantly less for interns than for second and third year residents is contrary to what was predicted.

Table 5

Correlation Matrix for OES Subscales: Pediatric Physicians  
vs. Normative Group (In parentheses)

Scale: RO	RI	RA	RB	RR	
RI	.188 (-.047)				
RA	.139 (.260)	.563 (.21)			
RB	.332 (.186)	.643 (.548)	.654 (.452)		
RR	.459 (.502)	.231 (.146)	.096 (.112)	.243 (.232)	
PE	.264 (.346)	.156 (.279)	.321 (.248)	.195 (.353)	.468 (.388)

Note: RO: Role Overload; RI: Role Insufficiency; RA: Role Ambiguity;  
 RB: Role Boundary; RR: Role Responsibility; PE: Physical  
 Environment.

Table 6

Occupational Environment Subscale Scores by PGY

Subscale:	PGY1s (N=15) Mean (S.D.)	PGY2s (N=14) Mean (S.D.)	PGY3s (N=18) Mean (S.D.)
Role Overload	33.73 (5.57)	30.07 (7.46)	30.83 (6.33)
Role Insufficiency	20.33 (5.19)	15.43 (3.20)	18.89 (6.42)
Role Ambiguity	23.43 (3.84)	19.57 (4.72)	19.89 (4.28)
Role Boundary	23.79 (6.62)	20.50 (4.01)	20.56 (4.08)
Role Responsibility	27.07 (4.80)	28.79 (6.25)	31.61 (4.06)
Physical Environment	20.73 (5.31)	24.00 (7.74)	21.79 (6.22)

The "Reactions to Call" index developed for this study correlated significantly with several of the OES subscale scores. An examination of Table 7 reveals moderate correlations with Role Overload, Role Ambiguity, and Role Responsibility. The hypothesis that the "Reactions to Call" index would be significantly correlated with role overload and role insufficiency was only partially supported.

In summary, three OES subscales and the OES total score were significantly greater than the normative group's scores. One OES subscale was below that for the norm group. There also appeared to be no consistent pattern to the OES sample and norm group subscale intercorrelations. Additionally, differences across PGY training years on the OES subscales were noted as were correlations between the RTC and OES subscales. Overall, there was only partial support offered for the hypothesis that pediatric interns/residents are more stressed than the normative group.

Hypothesis 2: This hypothesis tested for a significant correlational relationship between the overall measure of work stress (full scale OES score) and strain symptomatology. The results of a Pearson product-moment correlation revealed a significant correlation between stress and strain symptoms ( $r=.3912$ ,  $\underline{p}=.004$ ). This relationship was subsequently examined in terms of each of the OES subscales and the "Reactions to Call" index. These results are presented in Table 8. An inspection of this table indicates that two OES subscales (Role Overload and Role Ambiguity) have a high probability ( $\underline{p}<.05$ ) of being related to

Table 7

Correlation of Reactions to Call Index with OES Subscales

Subscale:	RO	RI	RA	RB	RR	PE	OES Total
RTC	.356	.173	.376	.194	.360	.228	.420
P-Value	.007	.122	.005	.098	.007	.062	.002

Note: RTC: Reactions to Call Index; RO: Role Overload; RI: Role Insufficiency; RA: Role Ambiguity; RB: Role Boundary; RR: Role Responsibility; PE: Physical Environment.

Table 8

Correlation of OES Scales and RTC with Strain

Subscale:	RTC	RO	RI	RA	RB	RR	PE
Strain	.408	.466	.121	.302	.189	.193	.240
P-Value	.002	.001	.209	.021	.105	.096	.052

Note: RTC: Reactions to Call Index; RO: Role Overload; RI: Role Insufficiency; RA: Role Ambiguity; RB: Role Boundary; RR: Role Responsibility; PE: Physical Environment.

strain symptomatology. Additionally, the Reactions to Call" index is significantly correlated with strain. The hypothesis of a significant relationship between stress and strain appears to be supported by the data.

Hypothesis 3: The hypothesis that there would be no difference in the number of Type A and non-Type A individuals in the sample was tested. The hypothesis was tested using Doty and Betz's (1981) Work Attitudes Questionnaire as the means of classifying individuals. Subjects were grouped into a 2X2 matrix based on the level of commitment to their job (high and low) and the extent to which they use psychologically healthy responses to their work (high and low). This classification system is hypothesized to identify the Type A behavior pattern (Doty and Betz, 1981). For the purposes of this hypothesis, the number of Type A individuals ( $N=20$ ) were compared to the subjects classified into the remaining three cells ( $N=27$ ). The results of a Chi-square goodness of fit test indicated that there was no significant difference between these observed and the expected frequencies ( $\chi^2 = .782$ ,  $p < .05$ ). This result supports the hypothesis.

Hypothesis 4: This hypothesis tested strain symptomatology from three points of view. The first analysis was performed to determine if differences in strain symptomatology would be an interaction of the Personal Resources Questionnaire (PRQ) full scale score and the OES full scale score. Findings supporting a relationship between the PRQ score (the measure of coping behaviors) and the OES score (the measure of occupational stress) are presented in Table 9.

Table 9

ANCOVA of Strain by OES and PRQ Total Scores (N=47)

Source	df	MS	F	P
Main Effects:				
PRQ Total	1	0.02	0.	.98
OES Total	1	907.13	17.03	.0001
Covariates:				
Regressive Coping	1	70.51	1.32	.26
Introversion	1	23.64	0.44	.51
Social Maladjustment	1	22.84	0.43	.52
Emotional Maladjustment	1	596.14	11.19	.002
Interaction				
OES by PRQ	1	63.29	0.006	.94
Explained	7	333.18	6.25	.0001
Error	39	53.86		
Total	46	95.86		



OES and PRQ groups were determined by use of a median split. Based on the literature that personality characteristics are related to stress (e.g. Fleishman, 1984), an Analysis of Covariance (ANCOVA) was employed to test this hypothesis. The covariates chosen were Introversion, Social Maladjustment, and Emotional Maladjustment, from Lanyon's (1970) Psychological Screening Inventory (PSI). These variables were developed from a factor analysis of 150 college students' responses to the PSI (Johnson and Overall, 1973). The factors developed in this study were selected as covariates because of their presumed similarity to the sample for this study and because these factors were found to be highly correlated with strain (Introversion:  $r=.39$ ,  $p=.004$ ; Social Maladjustment:  $r=.33$ ,  $p=.014$ ; Emotional Maladjustment:  $r=.68$ ,  $p=.0001$ ). The other covariate chosen was Regressive Coping. Regressive Coping was also found to be highly correlated ( $r=.46$ ,  $p=.001$ ) with strain symptomatology and was subsequently added as a covariate in an effort to reduce extraneous variance in strain symptomatology.

The results indicate that variance in strain symptomatology was significantly related to occupational stresses but not to the coping behaviors reported by the subjects. It appears that a significant amount of the variance in strain could not be accounted for by the interaction of coping with stress. These results do not support the first part of Hypothesis 4. In fact, the results indicate that variance in stress and strain is to a large extent related to the amount of Emotional Maladjustment. Further analysis indicated that this variable is independent of the total OES score.

The second analysis of strain was performed to determine if differences in strain symptomatology would be most significantly attributed to an interaction of commitment style with the OES total score (i.e. total stress score). OES groups were again determined by a median split. Commitment style was operationalized with Doty and Betz's (1981) Work Attitudes Questionnaire. The results of Hypothesis 3 were used to develop two groups (the Type A and non-Type A subjects) for the analysis. This ANCOVA utilized the same covariates as in the preceding analysis.

Table 10 presents the results of this analysis and indicates that variance in strain symptomatology was significantly related to occupational stresses but not to commitment style of the subjects'. Further, there was no interaction between commitment style and occupational stress. These results do not support the second part of Hypothesis 4. This supports Osipow and Spokane's conclusion that the main effect of occupational stress accounts for most of the variance in strain. The results further indicate that variance in stress and commitment style is to a large extent related to the amount of Emotional Maladjustment. This variance is independent of the total OES score.

The third analysis of strain was performed to determine if differences in strain symptomatology would be significantly attributable to an interaction between occupational stress (as measured by the OES total score) and the quantity and quality of the social support network. OES groups were again determined by the use of a median split. The quantity

Table 10

ANCOVA of Strain by OES and WAQ Total Scores (N=47)

Source	df	MS	F	P
Main Effects:				
WAQ Total	1	109.83	1.99	.16
OES Total	1	708.76	12.87	.001
Covariates:				
Regressive Coping	1	52.06	0.95	.34
Introversion	1	7.04	0.13	.72
Social Maladjustment	1	28.75	0.52	.47
Emotional Maladjustment	1	517.01	9.39	.004
Interaction				
OES by PRQ	1	10.85	0.19	.66
Explained	7	323.10	5.87	.0001
Error	39	55.08		
Total	46	95.86		

and quality of social support was determined by the items developed by Billings et al (1983) and employing a median split on the total score. The quality of social support was determined by a median split of the total score of the three qualitative indices (i.e. A Significant Relationship, Family Support, and Work Support). A 2X2 (quantity by quality) matrix was then developed where the subjects with high quantity and quality ( $N=10$ ) and low quantity and quality ( $N=16$ ) were utilized in the following ANCOVA. There were 16 subjects (34 percent of the sample) that fit neither of these criteria and were therefore excluded from the analyses.

The analysis of stress and the quantity/quality of social support by strain is presented in Table 11. The results indicate that variance in strain symptomatology was significantly related to occupational stress. The quantity and quality of the social support network did not prove to be significant. Also, there is no interaction between the variables. These results do not support the third part of Hypothesis 4. It appears that only the main effect of the Occupational Environment Scales total accounts for the variance in strain. The results indicate that the variance in stress and quantity/quality of social support is to a large extent related to the amount of Emotional Maladjustment. This variance is independent of the total OES score.

Overall, these results appear to indicate a strong main effect exists between stress (as measured by the OES total score) and strain symptomatology. Variables such as coping behaviors, commitment style,

Table 11

ANCOVA of Strain by OES Total and Quantity/Quality of a  
Social Support Network (N=47)

Source	df	MS	F	P
Main Effects:				
Quant/quality	1	174.53	2.74	.11
OES Total	1	873.68	13.73	.001
Covariates:				
Regressive Coping	1	0.95	0.02	.90
Introversion	1	8.34	0.13	.72
Social Maladjustment	1	0.07	0.001	.97
Emotional Maladjustment	1	425.10	6.68	.02
Interaction				
OES by PRQ	1	63.26	0.99	.33
Explained	7	295.74	4.65	.002
Error	232	63.62		
Total	30	117.78		

Note: 16 cases missing.

and social support appear to be unable to account for a significant amount of the variance in strain. Yet, it is important to note that throughout these analyses there was a significant covariate effect for Emotional Maladjustment. In summary, the three features of Hypothesis 4 were not supported by the results.

Hypothesis 5: This hypothesis tested an analysis of the predictors of high occupational stress (in the form of the total OES score) using a forward multiple regression procedure. High occupational stress was determined by selecting subjects whose OES total score was one standard deviation above the mean ( $N=11$ ). The rationale for using a one standard deviation criterion was based on the presumed need to make a prediction based on a sufficiently representative number of subjects from a small sample.

Predictor variables included the six OES subscales; the Reactions to Call index; the commitment and health subscales (from the WAQ); Introversion, Social Maladjustment and Emotional Maladjustment (from the PSI); regressive coping; and demographic variables including age, sex, and the number of hours worked during the preceeding week. Table 12 presents the results for the prediction of high occupational stress. These results do not support hypothesis five since none of the hypothesized predictors appeared in the derived equation.

Another multiple regression analysis of high occupational stress (i.e. high OES total) was run utilizing all of the above predictor variables except the six OES subscales. The six OES subscales were dropped

Table 12

Regression Analysis of High Occupational Stress


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Dependent Variable (Criterion) - High Occupational Environment Scale Total

Predictor Variable	R Square	B	Beta	F
OES 4 - Role Boundary	.68	1.44	.52	15.15
OES 5 - Role Responsibility	.88	1.84	.55	29.70
OES 3 - Role Ambiguity	.95	0.94	.24	46.65
OES 6 - Physical Environment (Constant)	.98	0.52 34.50	.21	68.00
Overall $\underline{F}$ = 68.00*		D.F. = 4,41		$\underline{*p}$ < .0001

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Table 13

Regression Analysis of High Occupational Stress


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Dependent Variable (Criterion) - High Occupational Environment Scale Total

Predictor Variable	R Square	B	Beta	F
Social Maladjustment (Constant)	.42	2.53 144.95	.65	6.58
Overall $\underline{F}$ = 6.58*		D.F. = 1,45		$\underline{*p}$ = .03

---

from the array of predictors because of their high correlation with the OES total score. High occupational stress was again determined by selecting OES total scores one standard deviation above the mean. The results of this second analysis are presented in Table 13. This finding provides only partial support the initial hypothesis in that it indicates Social Maladjustment as an important predictor of high amounts of occupational stress, but none of the other independent variables appear to contribute to explaining variance in occupational stress.

A supplementary regression analysis was run in an attempt to predict low amounts of occupational stress. OES total scores one standard deviation below the mean were selected as the criterion measure in this analysis ( $N=9$ ). Predictor variables remained the same as in the preceding equation. That is, no OES subscales were included as potential predictors. The results of this supplementary analysis are presented in Table 14. These findings indicate that the one variable Introversion (from the PSI) best predicts a low OES total score.

The preceding regression equations evaluated the predictors of occupational stress. In the equations a significant amount of variance was explained by the predictor variables. In the first equation, four of the possible six OES subscales were entered to enhance the prediction of high amounts of occupational stress. In the second equation (to predict high OES totals), one moderately strong predictor variable was selected (Social Maladjustment). In a supplementary analysis another psychological adjustment variable (Introversion) was found to be the



Table 14

Regression Analysis of Low Occupational Stress


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Dependent Variable (Criterion) - Low Occupational Environment Scale  
Total

Predictor Variable	R Square	R	Beta	F
Introversion (Constant)	.60	1.99 97.47	.78	10.57
Overall $F - 10.47^*$	D.F. = 1,45		$*p = .017$	

---

best predictor of low OES totals. These analyses do not clearly support hypothesis five.

Hypothesis 6: This hypothesis tested possible predictors of high amounts of strain symptomatology by a forward multiple regression procedure. The high strain criterion variable was developed by selecting scores greater than one standard deviation from the mean for the Symptoms of Strain questionnaire ( $N=10$ ).

Predictor variables included the commitment and health subscales (from the WAQ); the Recreation, Physical Coping, Social Support, and Rational-Cognitive Coping subscales (from the PRQ); occupational stress and its component subscales (from the OES); Introversion, Social Maladjustment and Emotional Maladjustment (from the PSI); and demographic variables such as hours worked during the preceding week.

The initial analyses indicated that no variables were predictors of high strain. Subsequently, the high strain criterion was changed so as to select the upper 25 percent of scores ( $N=13$ ). The rationale for this change was based on the need to select independent variables that could make a prediction. Table 15 presents the results for the prediction of high amounts of strain symptomatology. The obtained result only partially supports the hypothesis. In this regression equation one OES subscale (Role Boundary) provided an accurate prediction of high amounts of strain symptomatology, with a psychological adjustment variable (Introversion) functioning as a suppressor variable in the equation. A suppressor variable has no correlation with the criterion vari-

Table 15

Regression Analysis of High Strain


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Dependent Variable (Criterion) - High Strain Symptomatology

Predictor Variable	R Square	B	Beta	F
Role Boundary (OES 4)	.37	1.71	.85	6.49
Introversion	.60	-1.48	-.54	7.47
(Constant)		22.55		
Overall $\underline{F} = 7.47^*$		D.F. = 2,44		$\underline{*p} = .01$

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Table 16

Regression Analysis of Low Strain


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Dependent Variable (Criterion) - Low Strain Symptomatology

Predictor Variable	R Square	B	Beta	F
Social Maladjustment	.44	0.23	.67	7.16
(Constant)		18.50		
Overall $\underline{F} = 7.16^*$		D.F. = 1,45		$\underline{*p} = .025$

---

able, but is correlated with the predictor variable. It increases the power of the predictor by controlling for extraneous variance in the predictor variable.

A supplementary forward regression analysis was run in an attempt to predict low reports of strain symptomatology. Variables in the equation included all of the variables from the preceding equation plus the Recreation, Physical Coping, Social Supports, and Rational-Cognitive Coping subscales (from the PRQ); the quality of work and family support systems; and the quantity of social supports.

An initial attempt to compute this equation using scores one standard deviation below the mean ( $N=9$ ) failed to enter any predictor variables. A second attempt utilizing the lower 25 percent of scores ( $N=11$ ) identified a predictor. Results from this analysis are presented in Table 16. The overall finding indicates that a moderate amount of the variance in low strain can be explained by the psychological adjustment variable Social Maladjustment.

The preceding regression equations were performed to determine the best predictors of high and low amounts of strain symptomatology. In each equation a single independent variable appears to account for a significant proportion of the variance. Only partial support for the hypothesis was achieved by the finding that Role Boundary was a predictor of strain symptomatology. A supplementary analysis demonstrated that Social Maladjustment was a significant predictor of low amounts of strain symptoms.

Hypothesis 7: This hypothesis attempted to test for possible predictors of high regressive coping by a forward multiple regression analysis. The high regressive coping criterion was developed by selecting scores greater than one standard deviation from the mean for the Regressive Coping questionnaire (N=14). The rationale for using the one standard deviation criterion was the same as in the preceding analyses. Predictor variables included all of the proposed predictors from the preceding analysis of high strain.

Table 17 presents the results for the prediction of high amounts of regressive coping. The results partially support the stated hypothesis in finding the reported amount of Role Ambiguity (an Occupational Environments subscale) as a variable enhancing the prediction of high amounts of regressive coping. Rational-cognitive coping functions as a suppressor variable in the equation. That is, it had no correlation with the criterion variable, but was correlated with Role Ambiguity (RA) and functioned to improve RA's predictive power by controlling for extraneous variance in RA.

A supplementary forward regression analysis was run in an attempt to predict low amounts of regressive coping. Variables in the equation included all of the variables from the prediction of high regressive coping plus the quality of work and family support systems, and the quantity of social supports. These variables were included based on the theory that coping variables and social support would be employed by subjects as healthy techniques they could use to deal with stress.

Table 17

Regression Analysis of High Regressive Coping


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Dependent Variable (Criterion) - High Regressive Coping

Predictor Variable	R Square	B	Beta	F
Role Ambiguity (OES 3)	.59	0.70	.91	17.38
Rational-Cognitive Coping	.78	-0.30	-.45	19.68
(Constant)		27.30		
Overall $\underline{F} = 19.68^*$		D.F. = 2,44		$\underline{*p} = .0001$

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Table 18

Regression Analysis of Low Regressive Coping


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Dependent Variable (Criterion) - Low Regressive Coping

Predictor Variable	R Square	B	Beta	F
Social Maladjustment	.34	0.51	.94	5.75
Quantity of Relationships	.62	-0.03	-.63	8.09
(Constant)		18.15		
Overall $\underline{F} = 8.09^*$		D.F. = 2,44		$\underline{*p} = .008$

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The low regressive coping criterion was developed by selecting the scores from one standard deviation below the mean of the Regressive Coping questionnaire ( $N=9$ ). However, in this analysis no predictor variables were identified. Subsequently the lower 25 and 30 percent ( $N=11$  and  $N=13$ , respectively) of Regressive Coping scores were utilized in an attempt to establish predictors. Predictors could only be found for the lower 30 percent of Regressive Coping scores. Results from this supplementary analysis are presented in Table 18. These results indicate that a significant proportion of the variance in low regressive coping can be explained by the PSI variable Social Maladjustment. Quantity of social relationships acts as a suppressor variable in the equation. That is, it had no correlation with the criterion variable, but was correlated with Social Maladjustment (SM) and functioned to improve SM's predictive power by controlling for extraneous variance in SM.

The preceding regression equations evaluated the predictors of high and low amounts of regressive coping. In each equation a single independent variable appears to account for a significant proportion of the variance. Partial support for the initial hypothesis was achieved by the finding of Role Ambiguity (an OES subscale) as a predictor of regressive coping. A supplementary analysis demonstrated that Social Maladjustment was a predictor of low amounts of regressive coping.

Hypothesis 8: This hypothesis tested the exploratory analysis of the relationship among the three psychological adjustment variables on strain symptomatology, regressive coping, and the Reactions to Call

responses. Psychological adjustment as an independent variable was operationalized as the PSI factors Introversion, Social Maladjustment, and Emotional Maladjustment. These factors were developed by Johnson and Overall (1973) and appear to be the PSI factors most appropriate to this sample. The first analysis tested the effect of the three independent adjustment variables on strain symptomatology. Tables 19, 20, and 21 present the results of two-by-two ANOVAs analyzing strain symptomatology by pairs of adjustment variables.

The results of these ANOVAs indicate that Emotional Maladjustment is the single variable that consistently accounts for variance in strain symptomatology. However, the effect of Introversion and Social Maladjustment interacting also accounts for a significant amount of variance in strain. Findings such as this suggest that there is some interplay between personality factors (as represented by psychological adjustment) and strain. That is, personality characteristics have a significant input into a pediatric resident's reports of strain. This finding appears to support the exploratory hypothesis regarding strain symptoms.

Tables 22, 23, and 24 present the results of the 2X2 ANOVAs analyzing regressive coping by pairs of adjustment variables. The results of these ANOVAs indicate main effects for Introversion and Emotional Maladjustment, as well as a main effect for Social Maladjustment in one instance. However, there were no interaction effects present and thus the second exploratory hypothesis was not supported. These results seem



Table 19

ANOVA of Strain by Psychological Adjustment Variables:Introversion and Social Maladjustment

Source	df	MS	F	P
Main Effects:				
Introversion	1	379.37	4.83	.03
Social Maladjustment	1	249.50	3.18	.08
Interaction	1	440.36	5.62	.02
Explained	3	346.08	4.41	.009
Error	43	78.40		
Total	46	95.86		

Table 20

ANOVA of Strain by Psychological Adjustment Variables:Introversion and Emotional Maladjustment

Source	df	MS	F	P
Main Effects:				
Introversion	1	35.93	0.47	.50
Emotional Maladjustment	1	750.34	9.75	.003
Interaction	1	0.07	0.001	.98
Explained	3	366.26	4.76	.006
Error	43	76.99		
Total	46	95.86		

Table 21

ANOVA of Strain by Psychological Adjustment Variables:Social Maladjustment and Emotional Maladjustment

Source	df	MS	F	P
Main Effects:				
Social Maladjustment	1	73.84	1.05	.31
Emotional Maladjustment	1	918.12	13.11	.001
Interaction	1	261.61	3.74	.06
Explained	3	466.08	6.65	.001
Error	43	70.03		
Total	46	95.86		

Table 22

ANOVA of Regressive Coping by Adjustment Variables:Introversion and Social Maladjustment

Source	df	MS	F	P
Main Effects:				
Introversion	1	230.98	15.70	.0001
Social Maladjustment	1	97.31	6.62	.01
Interaction	1	8.68	0.59	.45
Explained	3	107.31	7.29	.0001
Error	43	14.71		
Total	46	20.79		

Table 23

ANOVA of Regressive Coping by Adjustment Variables:Introversion and Emotional Maladjustment

Source	df	MS	F	P
Main Effects:				
Introversion	1	108.99	6.89	.01
Emotional Maladjustment	1	55.04	3.48	.07
Interaction	1	2.74	0.17	.68
Explained	3	91.24	5.76	.002
Error	43	15.83		
Total	46	20.75		

Table 24

ANOVA of Regressive Coping by Adjustment Variables:Social Maladjustment and Emotional Maladjustment

Source	df	MS	F	P
Main Effects:				
Social Maladjustment	1	45.14	2.64	.11
Emotional Maladjustment	1	124.85	7.29	.01
Interaction	1	10.65	0.62	.44
Explained	3	72.59	4.24	.01
Error	43	17.13		
Total	46	20.75		

Table 25

ANOVA of "Reactions to Call" by Adjustment Variables:Introversion and Social Maladjustment

Source	df	MS	F	P
Main Effects:				
Introversion	1	19.98	0.41	.52
Social Maladjustment	1	135.03	2.79	.10
Interaction	1	1.36	0.03	.87
Explained	3	50.42	1.04	.38
Error	43	48.31		
Total	46	48.45		

Table 26

ANOVA of "Reactions to Call" by Adjustment Variables:Introversion and Emotional Maladjustment

Source	df	MS	F	P
<b>Main Effects:</b>				
Introversion	1	1.03	0.02	.89
Emotional Maladjustment	1	38.64	0.78	.38
Interaction	1	52.05	1.05	.31
Explained	3	35.19	0.71	.55
Error	43	49.37		
Total	46	48.45		

Table 27

ANOVA of "Reactions to Call" by Adjustment Variables:Social Maladjustment and Emotional Maladjustment

Source	df	MS	F	P
<b>Main Effects:</b>				
Social Maladjustment	1	103.67	2.15	.15
Emotional Maladjustment	1	26.23	0.55	.46
Interaction	1	3.19	0.07	.80
Explained	3	53.12	1.10	.36
Error	43	48.12		
Total	46	48.45		

to suggest that each psychological adjustment variable shares a significant proportion of the variance with regressive coping without significantly interacting with the other adjustment variables. That is, each psychological adjustment variable appears to have a significant input into a pediatric residents' report of regressive coping.

Tables 25, 26, and 27 present the results of the 2X2 ANOVAs analyzing the total score of the Reactions to Call index by pairs of adjustment variables. The results of these ANOVAs indicate no main or interaction effects for the three psychological adjustment variables. Thus the exploratory hypothesis was not supported. Overall, the pediatric resident's Reactions to Call appear to be independent of the personality factors utilized in this study.

#### Supplementary Analyses

In reviewing the results of the regression analyses for predicting strain symptomatology, a pragmatic attempt to discriminate between subjects reporting high and low amounts of strain symptoms was required in order to more fully understand the results of this study. Consequently, a discriminant analysis procedure was employed to statistically distinguish between the groups of subjects reporting high and low amounts of strain symptomatology and high and low amounts of regressive coping. A stepwise method (Wilks' lambda) was utilized for deriving the discriminating variables.

Potential discriminating (independent) variables included all the OES subscales; the Recreation, Self-Care, Social Support, and Rational-

Cognitive Coping subscales (from the PRQ); the quantitative and qualitative measures of social support; and Introversion, Social Maladjustment, and Emotional Maladjustment (from the PSI). The dependent variable in the first analysis was the measure of strain symptomatology. This was divided into high and low by a median split of the strain score. The median split was chosen on rational grounds.

Table 28 presents the results of the discriminant analysis including, Eigenvalue, Chi-square analysis, and Canonical correlation. The final Wilks lambda of .32 suggests that the variables entered on the derived function are able to distinguish between subjects who scored high and low on the strain measure. The Chi-square test of this discriminant function is significant and as such, indicates that the function accounts for a significant proportion of the variance. The squared value of the Canonical correlation (.689) indicates that the function accounted for approximately 69 percent of the variance in high and low strain scores.

The standardized discriminant function coefficients indicate that six of the seven variables are related to high amounts of strain. The positive coefficients Role Overload and Role Boundary have a moderate relationship to high amounts of strain. Self-Care, Introversion, Emotional Maladjustment, and Commitment are more strongly related to high amounts of strain and thus appear to be important discriminating variables. Quantity of social supports appears to be moderately related to low amounts of strain.

Based on the standardized coefficients, subjects reporting high

Table 28

Discriminant Analysis of High/Low Strain

Variable	Wilks' Lambda	Standardized Discriminant Function Coefficient	Sig.
Emotional Maladjustment	.64	.79	.001
Commitment (WAQ1)	.53	.82	.001
Introversion	.42	.71	.001
Self-Care (PRQ2)	.39	.65	.001
Role Overload (OES1)	.35	.33	.001
Quantity Social Supports	.33	-.37	.001
Role Boundary (OES4)	.32	.32	.001
Chi-square = 46.49	D.F. = 7	<u>p</u> = 0.0001	
Eigenvalue = 2.15	Canonical correlation = .83		

Table 29

Classification Analysis of Low/High Strain

Actual Group:	Number Cases	Predicted Group Membership:	
		Low Strain	High Strain
Low Strain	21	19 (90.5%)	2 (9.5%)
High Strain	25	4 (16.0%)	21 (84.0%)



amounts of strain are best described by their reports of Emotional Maladjustment, Commitment, Introversion, and Self-Care activities. They are to a lesser degree described by their reports of Role Overload and Role Boundary. Subjects reporting low amounts of strain are described by their reports of the number of social supports. The eigenvalue of this function and the large coefficients indicate a strong relationship between the discriminating variables and the criterion.

To check the degree to which the discriminant function correctly classified subjects into high and low strain groups the original data were reanalyzed using the Discriminant program (SPSS). Table 29 presents the classification analysis. The results indicate that 86.96 percent of the subjects were accurately classified using the discriminating variables. This suggests that the sample of pediatric interns/residents can be accurately classified based on the selected discriminating variables. Only six of the 46 subjects whose data were entered into the discriminant analysis were misclassified.

In summary, the results of the first discriminant analysis would support a hypothesis that a subject's self-report of high amounts of strain symptoms are strongly related to the level of emotional adjustment, a high level of commitment to work, the degree to which they are introverted, and the number of activities they do to take care of themselves.

A second discriminant analysis procedure was performed to determine the characteristics of subjects who reported utilizing low versus

high levels of regressive coping. This variable was divided into low and high amounts by a median split of the regressive coping distribution. Potential discriminating (independent) variables included all of those from the preceding analysis with the addition of the measure of strain symptomatology.

Table 30 presents the results of the discriminant analysis including, Eigenvalue, Chi-square analysis, and Canonical correlation. The final Wilks lambda of .54 suggests that the variables entered on the derived function are able to distinguish between subjects who scored high and low on the regressive coping measure. The Chi-square test of this discriminant function is significant and as such, indicates that the function accounts for a significant proportion of the variance. The squared value of the Canonical correlation (.462) indicates that the function accounts for approximately 46 percent of the variance in high and low regressive coping.

The standardized discriminant function coefficients indicate that six of the nine variables are related to low amounts of regressive coping. All of the positive coefficients (Family Support, Role Overload, Social Support, Recreation, Role Responsibility, and quality of a relationship) have a moderate relationship to low amounts of regressive coping. Strain, Introversion, and Rational-Cognitive Coping appear to be moderately related to high amounts of regressive coping.

Based on the standardized coefficients, subjects reporting high amounts of regressive coping are best described by their reports of

Table 30

Discriminant Analysis of Low/High Regressive Coping

Variable	Wilks' Lambda	Standardized Discriminant Function Coefficient	Sig.
Quality of a Relationship	.80	.55	.002
Strain Symptomatology	.67	-.39	.001
Social Support (PRQ3)	.64	.46	.001
Recreation (PRQ1)	.62	.52	.002
Role Responsibility (OES5)	.60	.53	.002
Rational-Cog. Cope. (PRQ4)	.58	-.59	.003
Introversion	.56	-.44	.003
Role Overload (OES1)	.55	.36	.003
Quality of Family Support	.54	.34	.004
Chi-square = 24.69	D.F. = 9	<u>p</u> = .003	
Eigenvalue = 0.868	Cannonical correlation = .68		

Table 31

Classification Analysis of Low/High Regressive Coping

Actual Group:	Number Cases	Predicted Group Membership:	
		Low Reg. Cope	High Reg. Cope
Low Reg. Cope	23	19 (82.6%)	4 (17.4%)
High Reg. Cope	24	7 (29.2%)	17 (70.8%)

Rational-Cognitive Coping. They are to a lesser degree described by their reports of Introversion and Strain. Subjects reporting low amounts of regressive coping are best described by their reports of the quality of a significant relationship, Role Responsibility, and Recreation. They are to a lesser degree described by their reports of Social Support, Role Overload, and the Quality of Family Support. The small eigenvalue and moderate coefficients indicate a moderate relationship between the discriminating variables and the criterion.

To check the degree to which the discriminant function correctly classified subjects into high and low regressive coping groups the original data were then reanalyzed using the Discriminant program (SPSS). Table 31 presents the results from this classification. The results indicate that 76.60 percent of the subjects were accurately classified using the discriminating variables. This suggests that the sample of pediatric interns/residents can be accurately classified based on the selected discriminating variables. Eleven of the 46 subjects whose data were entered into the discriminant analysis were misclassified.

In summary, the result of the second discriminant analysis support a hypothesis that an interns/residents self-report of high amounts of regressive coping behaviors are related to the number of strain symptoms they report, the extent to which they are introverted, and their use of rational-cognitive coping techniques. Low amounts of regressive coping appear to be related to the three types of social support, utilization of recreational coping strategies, and two occupational stress factors.

### Summary

The preceding sections of this chapter have presented analyses of the data collected. Only partial support was found for the first descriptive hypothesis. That is, three of the OES subscale scores and OES total score were found to be greater than the normative group scores. Additionally, differences in OES subscale scores across PGY training years were observed. The second descriptive hypothesis was supported by the significant correlation found between the full scale OES score and the measure of strain symptomatology. The final descriptive hypothesis was supported by the finding of no difference between the number of Type A and non-Type A individuals in the sample.

The hypothesized interaction effect on the dependent variable strain symptomatology (the first analytical hypothesis) was not supported. Instead, a strong main effect for occupational stress (i.e. total OES score) accounted for a significant proportion of the variance in strain. Subsequent analytical hypotheses reflected the attempt to predict high amounts of occupational stress, strain symptomatology, and regressive coping. The obtained predictors of high amounts of occupational stress did not support the hypothesis. The obtained predictors of strain (i.e. Role Boundary) only partially supported the hypothesis, and the obtained predictor of regressive coping (i.e. Role Ambiguity) only partially supported the hypothesis.

The final hypothesis called for the analysis of psychological adjustment variables in predicting strain, regressive coping, and the

"Reactions to Call". Main effects for each of the adjustment variables were observed. However, none of the hypothesized interaction effects were obtained. Emotional maladjustment was the variable that consistently accounted for variance in strain symptomatology. Each of the adjustment variables accounted for variance in regressive coping. None of the adjustment variables accounted for variance in a subject's reactions to call.

Finally, supplementary discriminant analyses were developed to distinguish between groups of subjects reporting high and low amounts of strain and high and low amounts of regressive coping. The results for describing subjects reporting low and high amounts of strain resulted in highly accurate classification of the subjects into the two groups. Results for the classification of the subjects into low and high regressive coping groups were also very accurate, though less so than in the preceding discriminant function. The results of these analyses were utilized to develop hypotheses for future study.

## CHAPTER V

### DISCUSSION

#### Overview

This chapter is organized into four sections. In the first, a systematic discussion of the results from the preceeding chapter is presented. The results are evaluated in terms of the specific research questions that were asked in this study. In the second section, the theoretical and programmatic implications of the study are discussed. This is followed by a commentary on the study's limitations. Finally, some directions for future research are offered.

#### Evaluation of Results

The initial question guiding this research project pertained to the occupational factors that best describe a pediatric internship and residency. Utilizing Osipow and Spokane's (1983) normative data as a reference group, it was found that four occupational stress factors (Role Overload, Role Insufficiency, Role Responsibility, and the Physical Environment) differentiate the pediatric sample from the reference group. Additionally, the summation of the six OES factors significantly differentiated the sample from the reference group.

Results such as these suggest that four occupational stress factors and the total OES score are sensitive to differentiating a pedia-

tric physician's occupational environment from the multiple environments represented in the norm group. Given the conclusion that residency is a stressful experience (e.g. Small, 1981), it appears that four OES factors and the total OES score may be the best descriptors of a pediatric physicians perceived stressors within the hospital environment. What appears to be of additional importance is that not only are the occupational stressors of the pediatrician's training identified, but also discerned are the features that are not likely stressors (e.g. Role Insufficiency). This result appears to be genuinely important in clarifying the stress producing features of the hospital environment for pediatric interns and residents.

Alexander's (1984) results with military and civilian family practice resident physicians supported the findings from this study with respect to the OES factors Role Overload and Role Insufficiency. However, he found no differences between Role Responsibility and the Physical Environment with his sample. Furthermore, his results indicated a significantly lower full scale OES score than that of the normative group. These latter findings provoke a number of questions for the results with the pediatric interns/residents. These questions include: How are pediatric interns/residents different from family practice residents? Are there features of their training programs that account for the observed OES differences? Are these observed group differences true group differences? An attempt to answer these questions necessitates a closer inspection of the data from these studies.



Alexander's results identified Role Overload as a likely source of stress for residents and Role Insufficiency as an unlikely source of stress for the residents. The differences in the other subscale findings may simply be a function of group, specialty, and/or programmatic differences. A partial answer to the question of these differences may be found in the difference between the reported hours worked each week in each sample. In Alexander's (1984) study, residents reported working 67 hours per week ( $\bar{X}=66.75$ , S.D.=19.07), whereas in this study an average of 81 hours per week were reported ( $\bar{X}=81.17$ , S.D.=16.64). This apparent difference may be a unique aspect of the different training programs and/or may be indicative of increased clinical workload and responsibilities in the pediatric program. Other differences between the samples exist as well (e.g. age). Unfortunately, such simple explanations are unlikely. More probable is that multiple group characteristics and instrument sensitivity account for the different findings. That is, other characteristics of the group (e.g. familial and educational background) and the problems associated with self report questionnaires may account for these differences.

The question as to whether the OES subscales can detect subtle differences between cohorts of interns/residents is an important one. The differences between PGY groups detected in this study tentatively suggests that the OES is a sensitive paper and pencil inventory for measuring occupational stress. Unfortunately, Alexander's study of family practice interns/residents failed to confirm these findings. It

seems plausible that a source of confounding in these findings is that unique programatic and specialtiy differences must be controlled for in this type of research. What the OES appears to be measuring are unique occupational environments and such environments may vary across different medical specialities. A more thorough understanding of this problem will likely come from the longitudinal study of pediatric interns/residents and from attempting validation studies at different institutions.

Another question guiding this research pertained to the relationship between occupational stress and self reported strain symptomatology. Kobasa (1982) noted a correlation coefficient of .38 between stressful life events and strain with a sample of lawyers. The finding with pediatric interns/residents that there is a .39 correlation between occupational stress and strain can be viewed as further support for a moderate, but consistent relationship between these constructs. Most notable is that the obtained relationship is slightly larger than the relationship typically seen in the health psychology literature. This finding seems to indicate that for some groups of individuals there is a strong, more direct relationship between stress and strain than for more general populations. The remaining variance in the correlation may be attributable to factors such as a subject's resilience to strain.

The obtained correlation coefficient is noteworthy for two other reasons. First, the conceptualization of occupational stress utilized in this study was quite different from Kobasa's (1982) use of stress associated with life events. Occupational stress was herein operation-

alized in terms of six relatively specific factors as opposed to the multiplicity of factors represented by life events. Secondly, the change in reporting of strain from a checklist to a Likert scale format did not interfere with the moderate correlation initially reported by Kobasa. This change to interval-level data appears to be a useful one in that it allows the researcher to appropriately use more sophisticated statistical procedures. It also provides greater clarity for the potential analyses of individual protocols.

The question of the possible artifactual nature of this correlational finding must certainly be raised. A reasonable way to rule out the competing explanations of this finding would be to follow the pediatric cohorts over time and evaluate stresses outside of the residency that may also impact on these individuals. Yet this moderate correlation does appear to be reasonable given the hypothesized effect of high amounts of stress on a person's physical and psychological well-being.

The third question guiding this research project entailed identifying the relative contributions of the stress resistance resources (i.e. commitment, coping, and social support) in mediating the stress-strain relationship. The results of the ANCOVA analyses indicated no apparent interaction effects between occupational stress and the resistance resources on the dependent measure strain. Instead, a main effect for occupational stress appeared to be the one consistent finding. In addition, the covariate Emotional Maladjustment (i.e. one's lack of self confidence, feelings of isolation and reports of somatic problems) consistently accounted for a significant proportion of the variance.

The obtained main effect for occupational stress features appears to heighten the importance of the previous correlational finding regarding the relationship between stress and strain. That is, for the pediatric interns/residents there appears to be a moderately strong relationship between stress and strain. Only one other variable appeared to account for a significant proportion of the remaining variance (i.e. social support). In light of the literature reviewed, this finding is somewhat disheartening as the stress resistance resources have been hypothesized to play such a strong interactive role in the mediation of stress. The strong consistent main effect for occupational stress suggests that the stress resistance resources play a lesser role than expected in the stress-strain relationship with pediatric residents. The role they do play and the contributions they make were the topic for the final research question.

The last research question concerned the identification of the best predictors of high amounts of occupational stress, strain, and regressive coping. The results for predicting high amounts of occupational stress indicated that the psychological adjustment variable Social Maladjustment is the best predictor of a global measure of high occupational stress. The OES subscale Role Boundary proved to be the best predictor of high amounts of strain symptomatology. And finally, Role Ambiguity (also from the OES) was found to be the best predictor of high amounts of regressive coping.

The results related to predicting high and low amounts of occupational stress suggest that the psychological adjustment variables, as measured by the PSI, are empirically useful predictors. Such findings were not hypothesized at the onset of the study. However, the findings have some intuitive appeal since several of the characteristics of the Social Maladjustment variable (i.e. anger and frustration) are typically considered to be signs of stress. What is disconcerting about this finding is that instruments utilized to measure adaptive and regressive coping, Role Overload, and one's reactions to being "on call" were not found to contribute to the prediction of overall high and low occupational stress. Thus, reliance on these variables as possible predictors of high and low occupational stress does not appear to hold true with this sample of pediatric physicians.

One manner of understanding the obtained findings is that the PSI's variables such as Social Maladjustment and Introversion may be more accurately characterized as behavioral styles that embody psychosocial behavioral characteristics. For example, Social Maladjustment may represent a behavioral style that is characterized by the ventilation of feelings of anger and frustration. These behavioral characteristics of the interns/residents appear to assume a more important predictive role than the other stress resistant resources measured.

The results from predicting high amounts of strain point to an OES subscale variable (Role Boundary) as the best predictor. This seems to suggest that the extent to which the subjects' feel conflict about more

than one authority telling them what to do within the hospital is the best predictor of high amounts of strain symptomatology. This finding was not clearly anticipated at the onset of the study, but tentatively suggests that the factors measured by the OES have rather strong predictive power. What makes this finding remarkable is that the Role Boundary factor in the sample was not found to be significantly different from the norm group mean score. Yet it accounted for a large percentage of the variance in the high stress group (i.e. high OES total score). One conclusion is that Role Boundary may be a good predictor of high amounts of stress and strain without necessarily being a factor that easily differentiates this sample from the norm group. That is, the implications of Role Boundary issues may have a more severe impact on this sample. An issue that should be further investigated is whether the mean for the norm group is possibly overinflated.

The discriminant analysis results in conjunction with the multiple regression results provide a further important test of the variables utilized in this study. Discriminant results further implicate Role Boundary, as well as five other variables, functioning to differentiate high from low strain groups. The results of the discriminant analysis suggest that an intern/resident who reports high amounts of strain is likely to be a poorly adjusted, introverted person who is highly committed to his/her occupation. These people are likely to engage in stress reducing activities, yet they experience great occupational demands that appear to create conflicts for them. That is, their personal styles are at variance with the environmental demands.

A closer inspection of the discriminant variables reveals patterns of overlap between what the variables measured. For example, the description of the Role Boundary variable highlights the issue of conflict in the person's occupational environment. Conflict is also an important aspect of the variable Emotional Maladjustment. Overall, the results of these two analyses suggest that conflict within the residency program's environment and the relative absence of social supports for the individuals best describes and predicts interns/residents in this sample who will report high amounts of strain.

Clinically useful interpretations can be made by examining low amounts of strain as a dependent variable for both prediction and description. An indication of the predictive (regression) results is that behaviors identified in the Social Maladjustment variable (i.e. the expression of anger and frustration) minimize symptoms of strain. A closer examination of this PSI scale's content suggests that it is more accurately characterized in terms of a psychosocial behavioral response. This behavioral response may reflect a particular coping style as well as a behavioral tendency that becomes manifest under stressful conditions. That is, under stress, people high in Social Maladjustment tend to get angry and frustrated. This interpretation is consistent with the viewpoint offered by Derogatis (1982) in the response oriented approach to understanding stress. That is, the characteristics measured by Social Maladjustment may be viewed as responses to the stress of internship and residency. The findings indicate that the more Social Malad-

justment is reported by an individual the better the prediction of low reports of strain symptoms. If these results are coupled with the discriminant analysis results, it is suggested that the people reporting low amounts of strain are best described as having a large number of social supports. Together, the results of these analyses indicate interventions addressing both sets of findings. These interventions will be addressed in the following section.

Regressive coping, the final variable to be examined by regression analysis, provides a theoretically and clinically interesting compliment to the predictors of strain. High and low amounts of regressive coping could be predicted with a high degree of accuracy. This finding appears to be of some importance. It suggests a slight alteration in the perspective one adopts in examining an occupational environment. Instead of assuming that strain is the most critical negative outcome, a codiciary perspective amenable to clinical intervention is suggested. That perspective looks more closely at the potentially detrimental behaviors engaged in by people rather than their reports of strain. These detrimental behaviors (i.e. regressive coping) are as salient factors for clinical intervention as are the feelings and symptoms of strain that may be generated by the environment and/or the individual.

The regressive coping measure may represent these detrimental behaviors that, like strain, may lead to illness. The results do not suggest that regressive coping is more or less important than strain, only that the more accurate ability to predict it makes regressive cop-



ing a clearer focal point for clinical interventions. The finding that high amounts of regressive coping are best predicted by a single occupational environment feature (Role Ambiguity) whereas low amounts of regressive coping are best predicted by a single PSI variable (Social Maladjustment) has direct significance for designing interventions with the pediatric interns/residents of this study.

The discriminant analysis results in conjunction with the multiple regression results shed further light on the issue of regressive coping. Interns/residents who report high amounts of regressive coping appear to be best described as introverted, strained, and attempting to rationalize their problems. Considering Role Ambiguity as the best predictor of high regressive coping, it may be hypothesized that the interns/residents described experience much uncertainty in the evaluation of their work. Such a constellation of factors promotes their tendency to use a regressive style of coping as their primary means of dealing with the stresses of the residency program. Overall, the tendency to be introverted and the use of rationalization as a coping mechanism may make them more susceptible to the stress associated with the uncertainty of their work and more likely to resort to regressive coping behaviors.

Interns/residents reporting low amounts of regressive coping appear to be best described as having a good social support system, using their support system for recreational activities, and yet acknowledging stress from their workload and their responsibilities. Though the emphasis on their social support system describes these people,

their tendency not to resort to regressive coping behaviors is best predicted by the degree to which they express feelings of anger and frustration.

This consistent finding of Social Maladjustment as an important predictor for aspects of stress, strain, and regressive coping strongly suggests its importance as a useful predictor. Based on the findings of this study, analyses of the the item content of the PSI, and analyses of randomly selected cases, it may be hypothesized that Social Maladjustment is, as suggested before, representative of a psychosocial behavior pattern that consists primarily of ventilating feelings of anger and frustration. Though reporting Social Maladjustment may be an important predictor of high amounts of stress, it also appears to be an important contributor to the alleviation of a physician's occupational stress. Thus with the residents who report low amounts of regressive coping, the style of ventilating feelings plus having a support network, provides them with an effective coping strategy for dealing with the rigors of the residency.

#### Theoretical and Programmatic Implications

There are several implications that result from the findings of this study. Three of these merit particular consideration here. The first is that it appears to be clinically useful to measure the characteristics of occupational stress with the subscales of the OES. These six subscales and full scale score appear to provide useful dimensions of stress that clarify the unique meaning of stress within a particular

work setting. The net benefit to an investigator is an increase in the meaning of the concept of stress. With these subscales clinicians and researchers can point to relatively specific occupational environmental features that promote stress in a particular workplace. This results in the concept of stress gaining additional theoretical relevance because the several specific stressors of an occupational environment can be more clearly identified. Additionally, similarities and differences between occupational environments can be more clearly described and examined.

Furthermore, analyses of the data from this study suggest that there is further support for the premise that a pediatric internship and residency is a stressful experience. Though this issue has generally been acknowledged for some time in the medical education literature, the results of this study are based on a psychometrically developed instrument. This lends greater meaning to the conclusion that interns/residents are stressed. More importantly, the instrument has permitted the investigator to identify salient features of a particular residency that are stressful to the pediatric interns/residents. Despite the need of further empirical support to assess the stability of the OES over time with this sample, it does lend itself to evaluating a hospital environment and possibly making corrective interventions for altering the occupational environment and ultimately making it a healthier environment in which to conduct medical training.

A second implication of this study concerns the proposed role of mediating variables in the stress-strain relationship. Though it was initially hypothesized that a number of stress resistance resources would play a role in predicting amounts of stress, the results of this study suggest that the role of coping variables and social support variables are not as important in predicting the dependent variables as they are in describing interns/residents who report low/high amounts of the dependent variables. High amounts of stress, strain, and regressive coping are best predicted by the PSI variables that appear to reflect behavioral styles, and OES subscale variables. PSI variables, and particularly Social Maladjustment, assumed a position of great importance in the prediction equations. It was in describing the subjects in the high and low dependent variable groups that the proposed mediating variables became statistically important.

The overall implication here appears to be that the proposed mediating variables make relative contributions in the hypothesized stress-strain relationship. That is, while a behavioral style seems to predict high amounts of reported stress, it also best predicts low amounts of strain and regressive coping. Yet to understand this result, it must be recognized that the behavioral style must be coupled with a social support system to effectively reduce strain and regressive coping.

Findings such as these further clarify the relative contributions made by the mediating variables in the stress-strain paradigm. They further attest to the importance of evaluating the uniqueness of each

occupational environment through the use of measures of the salient characteristics of the environment and the people who work in it. Thus a clinical intervention can be designed to appropriately and meaningfully address the unique features that constitute a stressful occupational environment such as a hospital.

In light of the preceding implications from the results of this study, three levels of clinical intervention seem possible. These include the individual residents, the residents as a group, and the organizational/administrative level of the residency program. An intervention that cuts across these levels might address the issue of Role Ambiguity since this is highly indicative of resident's reporting high amounts of stress and regressive coping. A problem in addressing this issue is the finding that the measure of Role Ambiguity for the pediatric interns/residents was not significantly different from Osipow and Spokane's reference group. This would seem to indicate that it is not a source of stress for the interns/residents. What may possibly constitute an appropriate intervention then, would be to identify the individual residents reporting the most Role Ambiguity. These residents could then be selectively targeted for study and intervention. Another possibility is that the amount of Role Ambiguity, despite being no different from that reported by the reference group, is a unique feature of this particular internship/residency. Given the numerous features constituting this sample, Role Ambiguity may be a viable target for intervention within the residency training program. That is, maybe the norm should

be disregarded and Role Ambiguity addressed as an important stress for the interns/residents.

An overview of these results brings to light the importance of evaluating any potential intervention from several points of view. As such, another possible point of intervention relates to the predictors of low strain and regressive coping. Most notable, the acknowledgment of feelings of anger and frustration coexisting with social supports may be an important area for clinical intervention at the group level. Such an intervention may simply be to assist the organization and development of a support group for residents and significant others in their life. A focus for these groups could be the productive ventilation of feelings of anger and frustration. Other supportive interventions have been identified by Berg and Garrard (1983) and include encounter groups and weekend retreats. The purpose of these interventions is to facilitate the development or expansion of informal support networks that the interns/residents can rely on to ventilate their feelings of anger and frustration as well as to build a sense of cohesion among the pediatric interns/residents.

The results from this study suggest a different importance to the concept of stress resistance resources. The finding of no main effect for the resistance resources in the ANCOVA analyses and the observation that they only functioned as suppressor variables in the regression equations, suggests that for pediatric interns/residents, the resistance resources are not potent predictor variables such as previously sug-

gested in the health psychology literature (e.g. Antonovsky, 1979). This finding is disconcerting since there has previously been support for the effect these variables have on the stress-illness relationship. The findings in the discriminant analyses, however, indicate that the resistance resources provide highly important descriptors of the interns/residents reporting high and low amounts of strain and regressive coping.

Yet, the results of this study do not constitute a reason for diminishing the investigative emphasis on the stress resistance resources as predictors of health and illness. Instead, further studies should attempt repeated examination of these variables so as to rule out the artifactual possibilities associated with these results. Perhaps increasing the sample size would provide a means of teasing out effects of the stress resistance resources in the ANCOVA analyses. Other problems may have also contributed to the results. In particular, the measurement of the stress resistance resources may need to be modified.

A final implication of the results of this study concerns the study's proposed paradigm. The paradigm viewed strain as a response to occupational stress and a likely precursor of illness. The results indicate that with the sample, a high amount regressive coping is the best predicted response to stress and specifically the stress of Role Ambiguity. High amounts of strain were best predicted by the OES subscale Role Boundary. This suggests that predictable negative consequences of occupational stress may also include a pediatric resident's

regressive coping activities. Strain and regressive coping appear to be variables that are closely associated with occupational stress. Low amounts of strain and regressive coping may be more susceptible to the influences of personal characteristics that a pediatric resident brings with him/her to the residency program (e.g. the resident's lack of confidence and feelings of isolation) as well as their social support network. Thus the paradigmatic shift called for by these results would be to evaluate several immediate and direct effects of stress as well as the consequences of prolonged stress. Additionally, it appears to be essential to identify people who report low amounts of these negative outcomes and identify the resistance resources that make them resilient.

One theoretical hypothesis based on the implications of this study is that illness or impairment in physicians capacity to carry out their responsibilities may likely arise from the direct effect of regressive coping as well as from prolonged periods of high strain. Strain, as measured here, may actually reflect a temporary state and only by prolonging it could illness or impairment become manifest. Regressive coping is an equally predictable outcome and may be a more enduring behavior style that increases the probability of subsequent illness. Only further research will clarify this problem. Clinically, a hypothetical intervention to address regressive coping would be specifically directed at such activities as smoking, drinking, and withdrawal. Additionally, facilitating the appropriate expression of anger and frustration may be a way of also alleviating these regressive coping behaviors.



### Limitations of the Study

There are several important limitations to this study. The first of these concerns the sample studied. The subjects represent only one pediatric residency program. This necessarily limits the extent to which the conclusions from this study could be generalized to other residents in subspecialties in other programs. Another related problem is that the observed between PGY group differences (e.g. Role Ambiguity) may not reflect true group differences. It was previously noted that there are some OES full scale and subscale differences between Alexander's results with family practice residents and the pediatric residents of this study. These differences may reflect true group differences rather than artifactual ones since there are also important similarities between the studies. Yet, in light of this, the sensitivity of the instruments must be raised as a possible limitation. Paper-and-pencil measures have frequently been criticized for their lack of sensitivity to subtle group differences and changes. This may be true for the psychometric instruments utilized in this study. Yet the psychometric instruments utilized for the study were chosen specifically for their psychometric integrity and as such it may be inferred from the data that the group differences obtained are true group differences. However, a repeated measures design or a simple replication would be necessary for further evaluating this criticism.

The unique approach taken to the study of the stress-illness problem is another possible limitation to this study. Much of the investi-

gation on this issue has chosen to evaluate stress in terms of life events whereas this study proposed an alternative to life events. The Occupational Environments Scales (Osipow and Spokane, 1983) represent a relatively different means of evaluating stress. With the OES, stress is conceptualized quite differently. The OES conceptualization is both specific and limited. It operationalizes specific aspects of occupational stress, yet fails to account for possible stresses outside of the work environment (e.g. stress from non-work related life events). This makes for a limitation to the study in that stressful features of a resident's life outside of work are neglected. This difference between the OES and life events measures represents a possibly serious confound in the stress-illness paradigm in that the OES and life events measures are likely measuring two different aspects of the concept of stress.

A further limitation in this study concerns the theoretical limits of relating a social-environmental measure of stress to the physiological response known as strain or illness. In the literature on the stress-illness paradigm, the issue of relating life events to diagnosable illnesses has been acknowledged as problematic and has at best shown moderate correlations between the two. The limitation in this paradigm, seen in the low to moderate correlations between stress and strain, is that we have as yet not specifically determined what about "stress" (no matter how measured) leads one to become ill. That is, we have yet to fully understand the psychophysiological changes that ensue with stressful life events or stressful occupational environments. Additionally,

it is not clear how stress resistance resources such as social supports and coping alter the physiological processes of illness. Krantz and Glass (1984) hypothesize that they may simply alter behavioral reactions to illness, but still we are left hypothesizing how these behaviors affect physiological processes.

#### Directions for Future Research

The results from the study of pediatric interns/residents suggests several issues and needs that should be addressed by future studies of stress, stress resistance resources, and the outcomes of stress. Perhaps the most important concern for future research concerns the need for a longitudinal assessment of the interns/residents of this study. A longitudinal followup could take one of two forms. One possibility would be the yearly evaluation of interns/residents to assess each cohorts uniquely perceived sources of stress, stress resistance resources employed, and changes in their perceived stresses over the course of a three year residency. This method would also lend itself to evaluating natural changes within the residency program (e.g. the implementation of a resident retreat weekend). It would further lend itself to the study of reported illness as an outcome measure.

Another possibility would be to evaluate the interns/residents several times over the course of one year. The methodological strength of this approach is the ability to further analyze the psychometric instruments for their reliability and stability. This approach would help to respond to problems in both the health psychology and medical

education literature. In the health psychology literature, this method could facilitate researcher's knowledge about the stability of occupational stresses and coping behaviors, and the possible interaction that may exist between them. The benefit to the field of medical education would be that the observed stresses of internship and residency could be examined for their changes over time. This benefit is based on the assumption, supported by this study, that internship is a stressful time, but would extend the results here by examining if and when it becomes less stress producing.

A second possibility for future research involves assessing and comparing pediatric interns/residents from different residency training programs. In following this line of research an investigator could continue to control for a medical subspecialty effect while then examining occupational environment and group differences (e.g. group differences in the use of stress resistance resources). The benefit of this approach would lie in further understanding the unique occupational environments of residency programs and the possible unique effects the programs have on their residents.

Future research can further benefit from examining interns/residents within other medical subspecialties. The benefits derived from this line of research are several and include examining existing specialty differences. In particular, a researcher may begin to examine the effects of different "on call" schedules and other natural group differences in predicting outcome measures such as strain and regressive coping.

A fourth direction for future research pertains to understanding and controlling for individual differences in survey research. In this study, Lanyon's (1970) Psychological Screening Inventory was the instrument utilized for this purpose. However, it appears that the factors within the PSI may differ based upon the sample studied (see Johnson and Overall, 1973). Therefore it seems likely that a refactoring of the PSI with a large sample of normal subjects would be useful in clarifying behavioral styles that the PSI is measuring.

This study has brought to light the issue of prediction and description in health psychology research. The initial emphasis of this study was on predicting strain and regressive coping. Yet supplementary analyses revealed useful descriptions of the subjects reporting high and low amounts of the dependent variables. The results from this study suggest the further utilization of an integrated approach to the study of stress and its outcomes. Integrating the results from both the prediction and description of relevant subject characteristics appears to have highlighted the different roles played by the resistance resources.

Possible directions for research emphasize a continued focus on the internship and residency training experience. Though this narrow focus may be perceived as conceptually limiting the generalizability of the results, there are important pragmatic advantages to such a line of research. One of these advantages concerns the extent to which research can guide residency programs in facilitating a physician's education and socialization into medical practice. The research results may guide

program directors to making corrective program additions, changes, or emphasize some component of the program that would result in a less negative consequence for the physician in training. Ultimately, any changes should have a beneficial effect on the medical care provided by the physician.

A second advantage is that future research may help training programs achieve a better quality fit between the physician in training and the hospital environment. Results from this study regarding the prediction and description of interns/residents reporting low amounts of strain and regressive coping suggest that evaluating person-environment characteristics may lead to enhancement of the interns/residents adaptive potential. That is, institutions where the features of the hospital training environment and the intern/resident can be appropriately "fit" are likely to result in fewer negative effects for both the physician and their training setting.

Future research will also need to address the issue of measurement of the constructs in the health psychology literature. Overall, there is a need for more robust measures of stress, the stress resistance resources, any outcome measure utilized, and the preexisting behavioral characteristics interns/residents bring with them to their training. What is indicated in light of the findings of this study is the need for the use of multiple measurements to understand the problem of the relationship between stress and its consequences. The utilization of multiple measures should, over time, help facilitate a refinement to the most

sensitive measures for evaluating the constructs under study. Additionally, the use of greater than one stress related consequence appears to be mandated. Illness, however operationalized, is a useful construct to measure. Yet this study has suggested that there are other negative consequences besides illness that are of theoretical and pragmatic importance in health psychology. As such, utilizing multiple independent and dependent measures will continue to be essential in guiding future research.

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APPENDIX A

August , 1984

Dr.  
Children's Memorial Hospital  
Chicago, Illinois 60614

Dear Dr.

Physicians involved in graduate training are becoming more concerned about the effects of stress during the internship and residency. For some time I have been interested in the salient aspects of residency training that have to do with work stress. In particular, the effects of high amounts of work stress during the pediatric residency and the consequences for one's health and professional well-being are of concern to me. However, from a scientific viewpoint, relatively little is known about the types of stresses experienced and the outcomes of these for interns and residents.

In order to help me get an empirical grasp on this important aspect of your medical training, I am asking that you complete the following questionnaire. In order that the results will truly represent the pediatric interns and residents at Children's Memorial it is important that the questionnaire be completed and returned in the enclosed envelope. Completing the questionnaire takes approximately 70 minutes and may be accomplished in more than one sitting.

You may be assured of the complete confidentiality of your responses. Only I will be examining your returned questionnaire. The questionnaire has an identification number for mailing purposes only. This is so that I may check your name off the mailing list when your questionnaire is returned. Your name will only be attached to the following research waiver, and will never be placed on the questionnaire itself. All research waivers will be kept separate from the questionnaire and only I will have access to them. Nowhere in the data reduction process will your name appear. Again, please do not put your name anywhere on the questionnaire. These procedures are in strict accordance with the ethical principles of the American Psychological Association.

A summary of the results of this study will be sent to all the pediatric residents at Children's Memorial. Additionally, individual discussions of these results can be arranged by contacting me personally. I would be most happy to answer any other questions you might have. Please feel free to contact me at 866-7032 with your questions and/or comments.

I am well aware of the extraordinary demands on your schedules and therefore hope that you find your participation in this study to be interesting and useful. Thank you for your assistance.

Sincerely,

Robert D. Annett

APPENDIX B

## RESEARCH WAIVER

In order for you to participate in this research project, it is necessary that you sign your name under the research consent statement below. Please sign your name in the appropriate space if you wish to participate in this research project and agree with the statement below. Thank you.

---

I understand that this research project concerns itself with the effects of occupational stress during a pediatric internship and residency and the consequences for one's health and professional well-being. I understand that the procedure involved in this study is that of responding to a questionnaire. Completing the questionnaire takes approximately 70 minutes and need not be accomplished in one sitting.

I understand that completing this questionnaire entails no experimental procedure(s) and that there are no anticipated risks in completing it.

I understand that there are no direct individual benefits from completing the questionnaire, though there are indirect benefits to be achieved from this study. I understand that these benefits rest on the premise that a more empirically based understanding of the stress experienced by residents, and the stress resistant resources which successfully help them cope with it will provide an empirically based understanding of the differences that exist among interns and residents in their ability to deal with stress. More thorough knowledge about these factors may benefit the medical education system and ultimately the public.

I agree to participate in the project and understand that I have the right to withhold information or ~~withdraw from the project at any time~~. Also, I understand that the data collected by the investigator may be used in research reports, but that I will not be identified by name. Finally I understand that I will not be required to perform any tasks other than those which have been explained to me as pertinent to this research project.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Code Number \_\_\_\_\_

Thank you for your cooperation. I hope you find your participation in the project to be interesting and helpful.

APPENDIX C

INTERNSHIP AND RESIDENCY STRESS QUESTIONNAIRE

Code Number \_\_\_\_\_

Please respond to the following questions. Your responses will remain confidential.

Sex: \_\_\_\_\_ Female \_\_\_\_\_ Male

Age: \_\_\_\_\_ Years

Marital Status: \_\_\_\_\_ Single \_\_\_\_\_ Married \_\_\_\_\_ Divorced \_\_\_\_\_ Other

Year in residency: \_\_\_\_\_ PGY1 \_\_\_\_\_ PGY2 \_\_\_\_\_ PGY3 \_\_\_\_\_ Other

Approximately how many hours have you worked in the past week? \_\_\_\_\_ Hours

In a typical night "on call", how many hours of sleep do you get? \_\_\_\_\_ Hours

How many nights have you been "on call" in the past two weeks? \_\_\_\_\_ Nights

Do you "moonlight"? \_\_\_\_\_ Yes \_\_\_\_\_ No

If yes, approximately how many times in the previous two months? \_\_\_\_\_ Times

Approximately how many hours of sleep do you get when at home? \_\_\_\_\_ Hours

Are you responding to this survey while....

\_\_\_\_\_ at work? \_\_\_\_\_ at home? \_\_\_\_\_ at another place?  
(see below)

If at work, are you "on call"? \_\_\_\_\_ Yes \_\_\_\_\_ No

When were you last "on call"? \_\_\_\_\_ Day(s) ago

On a scale of 1 to 10 how would you rate your energy level while completing this questionnaire?

Extremely Alert; Energized	1	2	3	4	5	6	7	8	9	10	Extremely Fatigued; Very Drained
----------------------------------	---	---	---	---	---	---	---	---	---	----	---

Please indicate the degree to which you have experienced each of the following after a night "on call". On the answer side of the page you'll notice that 5 stands for Most of the Time, and 1 stands for Rarely or Never.

Most of the Time	Usually	Often	Occasionally	Rarely or Never
5	4	3	2	1

After a night "on call" I ....

experience mood changes (eg. get "punchy")	5	4	3	2	1
become more easily irritated	5	4	3	2	1
have difficulty concentrating	5	4	3	2	1
become easily depressed	5	4	3	2	1
am more sensitive to criticism	5	4	3	2	1
easily become anxious	5	4	3	2	1
have difficulty remembering what I say to others	5	4	3	2	1
When I can sleep during a night "on call", I sleep well.	5	4	3	2	1
I get enough sleep when <u>not</u> "on call".	5	4	3	2	1
Call has interfered with my personal and professional sensitivity.	5	4	3	2	1

APPENDIX D

OCCUPATIONAL ENVIRONMENT SCALES

This measure is called the Occupational Environment Scales. It is designed to measure different kinds of stresses people experience in their work. On the answer side of the page you'll notice that 5 stands for Most of the Time, and 1 for Rarely or Never. Read each statement and circle whichever of the five responses seems to fit you best for each statement. Please be sure to respond to all 60 items, even if it is difficult to do so. Circle the most appropriate response.

	Most of the Time 5	Usually 4	Often 3	Occasionally 2	Rarely or Never 1
1. At work I am expected to do too many different tasks in too little time.	5	4	3	2	1
2. I feel that my job responsibilities are increasing.	5	4	3	2	1
3. I am expected to perform tasks on my job for which I have never been trained.	5	4	3	2	1
4. I hate to take work home with me.	5	4	3	2	1
5. I have the resources I need to get my job done.	5	4	3	2	1
6. I feel competent in what I do.	5	4	3	2	1
7. I work under tight time deadlines.	5	4	3	2	1
8. I wish that I had more time to deal with the demands placed upon me at work.	5	4	3	2	1
9. My job requires me to work in several equally important areas at once.	5	4	3	2	1
10. I am expected to do more work than is reasonable.	5	4	3	2	1
11. I feel that my career is progressing about as I hoped it would.	5	4	3	2	1
12. I feel that my job fits my skills and interests.	5	4	3	2	1
13. I am bored with my job.	5	4	3	2	1
14. I feel I have enough responsibility on my job.	5	4	3	2	1
15. I feel my talents are being used on my job.	5	4	3	2	1
16. I feel my job has a good future.	5	4	3	2	1
17. I am able to satisfy my needs for success and recognition in my job.	5	4	3	2	1
18. I feel overqualified for my job.	5	4	3	2	1

19. I learn new skills in my work.	5	4	3	2	1
20. I have to perform tasks that are beneath my ability.	5	4	3	2	1
21. My supervisor provides me with useful feedback about my performance.	5	4	3	2	1
22. It is clear to me what I have to do to get ahead.	5	4	3	2	1
23. I am uncertain about what I am supposed to accomplish in my work.	5	4	3	2	1
24. When faced with several tasks I know which should be done first.	5	4	3	2	1
25. I know where to begin a new project when it is assigned to me.	5	4	3	2	1
26. My supervisor asks for one thing, but really wants another.	5	4	3	2	1
27. I understand what is acceptable personal behavior on my job (eg. dress, interpersonal relations, etc.).	5	4	3	2	1
28. The priorities of my job are clear to me.	5	4	3	2	1
29. I have a clear understanding of how my boss wants me to spend my time.	5	4	3	2	1
30. I know the basis on which I am evaluated.	5	4	3	2	1
31. I feel conflict between what my employer expects me to do and what I think is right or proper.	5	4	3	2	1
32. I feel caught between fractions at work.	5	4	3	2	1
33. I have more than one person telling me what to do.	5	4	3	2	1
34. I feel I have a stake in the success of my employer (or enterprise).	5	4	3	2	1
35. I feel good about the work I do.	5	4	3	2	1
36. My supervisors have conflicting ideas about what I should be doing.	5	4	3	2	1
37. I am proud of what I do for a living.	5	4	3	2	1
38. It is clear who really runs things where I work.	5	4	3	2	1
39. I have divided loyalties on my job.	5	4	3	2	1
40. The work I do has much payoff for me as for my employer.	5	4	3	2	1
41. I feel I deal with more people during the day than I prefer.	5	4	3	2	1

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42. I spend time concerned with the problems others at work bring to me.	5	4	3	2	1
43. I am responsible for the welfare of subordinates.	5	4	3	2	1
44. People on the job look to me for leadership.	5	4	3	2	1
45. I have on the job responsibility for the activities of others.	5	4	3	2	1
46. I worry about whether people who work for/with me will get things done properly.	5	4	3	2	1
47. People who work for/with me are really hard to deal with.	5	4	3	2	1
48. If I make a mistake in my work, the consequences for others can be pretty bad.	5	4	3	2	1
49. My job demands that I handle an angry public.	5	4	3	2	1
50. I like the people I work with.	5	4	3	2	1
51. On my job I am exposed to high levels of noise.	5	4	3	2	1
52. On my job I am exposed to high levels of wetness.	5	4	3	2	1
53. On my job I am exposed to high levels of dust.	5	4	3	2	1
54. On my job I am exposed to high temperatures.	5	4	3	2	1
55. On my job I am exposed to bright lights.	5	4	3	2	1
56. On my job I am exposed to low temperatures.	5	4	3	2	1
57. I have an erratic work schedule.	5	4	3	2	1
58. On my job I am exposed to personal isolation.	5	4	3	2	1
59. On my job I am exposed to unpleasant odors.	5	4	3	2	1
60. On my job I am exposed to poisonous substances.	5	4	3	2	1

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APPENDIX E

## SYMPTOMS

Please indicate (by circling the appropriate number) the degree to which you have experienced each symptom in the past month. On the answer side of this page you'll notice that 1 stands for Not at All, and 5 stands for Very Often.

Not at All	A Little (once per month)	Sometimes (2 or 3 times per month)	Quite a Bit (4 to 6 times per month)	Very Often (7+ times per month)	
1	2	3	4	5	
1. Heartburn, upset stomach, recurrent diarrhea	1	2	3	4	5
2. Headaches	1	2	3	4	5
3. Loss of appetite	1	2	3	4	5
4. Dizzy spells	1	2	3	4	5
5. Nervousness	1	2	3	4	5
6. Shortness of breath	1	2	3	4	5
7. Trouble sleeping	1	2	3	4	5
8. Irregular heartbeats	1	2	3	4	5
9. Anxiety attacks	1	2	3	4	5
10. Inability to concentrate	1	2	3	4	5
11. Sweaty palms	1	2	3	4	5
12. Shaky hands	1	2	3	4	5
13. Stiffness in the back of the neck	1	2	3	4	5
14. Crying spells	1	2	3	4	5
15. Hyperventilation	1	2	3	4	5
16. Depression	1	2	3	4	5

APPENDIX F

WORK ATTITUDES QUESTIONNAIRE

Please indicate by circling the appropriate number the degree to which you believe the following statements describe your behavior and feelings. Responses are interpreted in the following manner:

	Strongly Disagree 1	Disagree 2	Uncertain 3	Agree 4	Strongly Agree 5		1	2	3	4	5
1. I am almost always doing something productive.											
2. I have many strong outside interests beyond my work.											
3. I have difficulty finding time for family activities and vacations.											
4. I worry a great deal about what I have't done.											
5. I would rather stay at work and finish a task than leave something half-done and rush to get home.											
6. No one has ever done a better job than I in my present position at work.											
7. One project begets another....ad infinitum.											
8. I cannot really respect others who are not willing to work as hard as hard as I do.											
9. I am rarely sick - and almost never during the work week.											
10. No one has ever blamed family problems on my work.											
11. I compete to win at everything, including games played with my family.											
12. I get restless and irritable during a long weekend.											
13. Dinnertime conversation always includes some reference to my work.											
14. Weekends are reserved for my family and friends.											
15. I often dream about work.											
16. I think about work in social situations.											
17. Most of my reading is related to my work.											
18. I often get "antsy" with nothing to do on vacations and holidays.											
19. Circumstances force me to work long hours at work.											
20. Work frustrations come home with me.											
21. My work is a constant source of gratification.											
22. I feel vaguely guilty when I am not doing something productive.											
23. About half of the social occasions in my home during the past year have been related to my work.											
24. My job seems to monopolize my time and energy even when I would like to get away from it for a while.											
25. My family has never accused me of being more interested in my work than in them.											
26. My energy level is unusually high.											
27. I am rarely able to relax completely.											
28. My family would agree that I leave my worries at the office (hospital).											
29. I get more done than most people I know.											
30. If I were independently wealthy I would still work.											
31. I play (or would if I could) work-related material in my car on the way to and from work.											
32. Few people work as hard or are as dedicated and loyal as I am where my work is concerned.											
33. Personal decisions are often influenced by the expectations of those for whom I work.											
34. I lose track of time when engaged in a project for work.											
35. Frequently I find it necessary to go to the office (hospital) during the weekend.											
36. My work responsibilities prevent involvement in community affairs.											
37. I feel uncomfortable when I'm not working.											
38. I usually take work home with me.											
39. I sometimes prefer staying at work late to being at home.											
40. I find myself smoking too much and/or drinking too much, generally restless and irritable when not working.											
41. I generally prefer work over other activities.											
42. In any situation outside of work my mind wanders frequently to problems or other aspects of my job.											

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43. I often work after dinner. 1 2 3 4 5
44. It is difficult for me to imagine not working. 1 2 3 4 5
45. The feeling of a job-well-done could almost be described as intoxicating. 1 2 3 4 5

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APPENDIX G

PERSONAL RESOURCES QUESTIONNAIRE

This instrument is called the Personal Resources Questionnaire. It is designed to measure the extent to which resources are available to people to counteract the effects of occupational stress. On the answer side of the page you'll notice that 5 stands for Most of the Time, and 1 for Rarely or Never. Read each statement and circle whichever of the five responses seems to fit you best for each statement. Please be sure to respond to all 30 items, even if it is difficult to do so. Circle the most appropriate response.

	Most of the Time 5	Usually 4	Often 3	Occasionally 2	Rarely or Never 1					
1. When I need a vacation I take one.					5	4	3	2	1	
2. I am able to do what I want in my free time.					5	4	3	2	1	
3. On weekends I spend time doing the things I enjoy most.					5	4	3	2	1	
4. Lately, my main recreational activity is watching TV.					5	4	3	2	1	
5. A lot of my free time is spent attending performances (eg. sporting events, theater, movies, concerts, etc.).					5	4	3	2	1	
6. I spend a lot of my free time participating in activities (eg. sports, music, painting, sewing, etc.).					5	4	3	2	1	
7. I spend a lot of my time in community activities (eg. religious, school, local, government, etc.).					5	4	3	2	1	
8. I find engaging in recreational activities relaxing.					5	4	3	2	1	
9. I spend enough time in recreational activities to satisfy my needs.					5	4	3	2	1	
10. I spend a lot of my free time on hobbies (eg. collections of various kinds, etc.).					5	4	3	2	1	
11. I am careful about my diet (eg. eating regularly, moderately, and with good nutrition in mind).					5	4	3	2	1	
12. I get regular physical checkups.					5	4	3	2	1	
13. I avoid excessive use of alcohol.					5	4	3	2	1	
14. I exercise regularly (at least 20 minutes most days).					5	4	3	2	1	
15. I practice "relaxation" techniques.					5	4	3	2	1	
16. I get the sleep I need.					5	4	3	2	1	
17. I avoid eating or drinking things I know are unhealthy (eg. coffee, tea, cigarettes, etc.).					5	4	3	2	1	
18. I engage in meditation.					5	4	3	2	1	
19. I practice deep breathing exercises a few minutes several times each day.					5	4	3	2	1	
20. I set aside time to do the things I really enjoy.					5	4	3	2	1	
21. There is at least one person important to me who values me.					5	4	3	2	1	
22. I have help with tasks around the house.					5	4	3	2	1	
23. I have help with the important things that have to be done.					5	4	3	2	1	
24. There is at least one sympathetic person with whom I can discuss my concerns.					5	4	3	2	1	
25. There is at least one sympathetic person with whom I can discuss my work problems.					5	4	3	2	1	
26. I feel I have at least one good friend I can count on.					5	4	3	2	1	
27. I feel loved.					5	4	3	2	1	
28. There is a person with whom I feel really close.					5	4	3	2	1	
29. I have a circle of friends who value me.					5	4	3	2	1	
30. I gain personal benefit from participation in formal social groups (eg. religious, political, professional organizations, etc.).					5	4	3	2	1	
31. I am able to put my job out of my mind when I go home.					5	4	3	2	1	
32. I feel that there are other jobs I could do besides my current one.					5	4	3	2	1	
33. I periodically re-examine or reorganize my work style and schedule.					5	4	3	2	1	
34. I can establish priorities for the use of my time.					5	4	3	2	1	
35. Once they are set, I am able to stick to my priorities.					5	4	3	2	1	
36. I have techniques to help avoid being distracted.					5	4	3	2	1	
37. I can identify important elements of problems I encounter.					5	4	3	2	1	
38. When faced with a problem I use a systematic approach.					5	4	3	2	1	
39. When faced with the need to make a decision I try to think through the consequences of choices I might make.					5	4	3	2	1	
40. I try to keep aware of important ways I behave and things I do.					5	4	3	2	1	

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APPENDIX H

## COPING STRATEGIES

Please indicate the degree to which you utilize the following coping strategies. On the answer side of the page you'll notice that 1 stands for Not at All, and 5 stands for Very Often.

Not at All	A Little	Sometimes	Quite a Bit	Very Often
1	2	3	4	5

In coping with stress(es) at work I ....

get angry	1	2	3	4	5
drink more	1	2	3	4	5
smoke more	1	2	3	4	5
take medication to relax	1	2	3	4	5
become apathetic or indifferent	1	2	3	4	5
withdraw physically from the situation	1	2	3	4	5
take some time off	1	2	3	4	5
use a relaxation technique	1	2	3	4	5

In coping with stress(es) at home I ....

become apathetic or indifferent	1	2	3	4	5
get angry	1	2	3	4	5
smoke more	1	2	3	4	5
drink more	1	2	3	4	5
withdraw physically from the situation	1	2	3	4	5
take medication to relax	1	2	3	4	5

---

APPENDIX I

## SIGNIFICANT RELATIONSHIPS

Please reply by providing the appropriate NUMBER.

- About how many friends do you have? \_\_\_\_\_ friends
- How many "close" friends do you have? \_\_\_\_\_ friends
- How many people can you presently count on for  
real help in times of trouble? \_\_\_\_\_ people
- How many clubs and organizations (eg. church  
group, PTA, bowling team) do you belong to? \_\_\_\_\_ clubs and  
\_\_\_\_\_ organizations

In the past MONTH ....

- how many visits have you had with friends at your home? \_\_\_\_\_
- how many visits have you had with friends outside your home? \_\_\_\_\_
- how many visits have you had with relatives at your home? \_\_\_\_\_
- how many visits have you had with relatives outside your home? \_\_\_\_\_
- \_\_\_\_\_

APPENDIX J

QUALITY OF A SIGNIFICANT RELATIONSHIP

Think of a person who is important to you. Indicate their relationship to you.

Relationship:    \_\_\_ spouse    \_\_\_ parent    \_\_\_ child    \_\_\_ other

How often do the two of you:

	Never	Seldom	Some- times	Fairly Often	Often
calmly discuss something to gether	1	2	3	4	5
have a stimulating exchange of ideas	1	2	3	4	5
disagree about something important	1	2	3	4	5
become critical and disapproving	1	2	3	4	5
have a good time together	1	2	3	4	5
become angry	1	2	3	4	5

**APPENDIX K**

FAMILY SUPPORT

These are statements about families. You are to describe which of these statements are TRUE for your family and which are FALSE.

You may feel that some of these statements are true for some family members and false for others. Circle T if the statement is TRUE for most members. Circle F if the statement is FALSE for most members. If the members are equally divided, decide what is your stronger overall impression and answer accordingly.

Remember, I would like to know what your family seems like to you. So do not try to figure out how other members see your family, but do give your general impression of your family for each statement.

- |   |   |   |
|---|---|---|
| 1. Family members really help and support one another.                                      | T | F |
| 2. Family members often keep their feelings to themselves.                                  | T | F |
| 3. We fight a lot in our family.  | T | F |
| 4. We often seem to be killing time in our family.  | T | F |
| 5. We say anything we want to at home.  | T | F |
| 6. Family members rarely become openly angry.   | T | F |
| 7. We put a lot of energy into what we do at home.  | T | F |
| 8. It's hard to "blow off steam" at home without upsetting somebody.                        | T | F |
| 9. Family members get so angry they throw things.   | T | F |
| 10. There is a feeling of togetherness in our family.                                       | T | F |
| 11. We tell each other about our personal problems.   | T | F |
| 12. Family members hardly ever loose their temper.  | T | F |
| 13. We rarely volunteer when something has to be done at home.                              | T | F |
| 14. If we feel like doing something on the spur of the moment we often just pick up and go. | T | F |
| 15. Family members often criticize each other.  | T | F |
| 16. Family members really back each other up.   | T | F |
| 17. Someone usually gets upset if you complain in our family.                               | T | F |
| 18. Family members sometimes hit each other.  | T | F |
| 19. There is very little group spirit in our family.  | T | F |

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- |   |   |   |
|---|---|---|
| 20. Money and paying bills is openly talked about in our family.                                | T | F |
| 21. If there's any disagreement in our family, we try to smooth things over and keep the peace. | T | F |
| 22. We really get along well with each other.   | T | F |
| 23. We are usually careful about what we say to each other.                                     | T | F |
| 24. Family members often try to one-up or out-do each other.                                    | T | F |
| 25. There is plenty of time and attention for everyone in our family.                           | T | F |
| 26. There are a lot of spontaneous discussions in our family.                                   | T | F |
| 27. In our family, we don't believe you get anywhere by raising your voice.                     | T | F |

In responding to the preceding items how did you conceptualize your family?

- Yourself only  
 You, your Spouse and children  
 You and someone you are living with  
 You and your parents  
 You, your siblings and parents  
 Other (Please describe)



APPENDIX L

WORK SUPPORT

These are statements about the place in which you work. These statements are intended to apply to all work environments. However, some words may not be suitable for your work environment. For example, the term supervisor is meant to refer to the boss, department head, or person to whom an employee reports.

You are to decide which of these statements are true for your work environment and which are false. Circle T if the statement is TRUE or MOSTLY TRUE. Circle F if the statement is FALSE or MOSTLY FALSE.

- |   |   |   |
|---|---|---|
| 1. The work is really challenging.  | T | F |
| 2. People go out of their way to help a new employee feel comfortable.                  | T | F |
| 3. Supervisors tend to talk down to employees.  | T | F |
| 4. There is not much group spirit.  | T | F |
| 5. The atmosphere is somewhat impersonal.   | T | F |
| 6. Supervisors usually compliment an employee who does something well.                  | T | F |
| 7. A lot of people seem to just be putting in time.                                     | T | F |
| 8. People take a personal interest in each other.                                       | T | F |
| 9. Supervisors tend to discourage criticisms from employees.                            | T | F |
| 10. People seem to take pride in the organization.                                      | T | F |
| 11. Employees rarely do things together after work.                                     | T | F |
| 12. Supervisors usually give full credit to ideas contributed by employees.             | T | F |
| 13. People put quite a lot of effort into what they do.                                 | T | F |
| 14. People are generally frank about how they feel.                                     | T | F |
| 15. Supervisors often criticize employees over minor things.                            | T | F |
| 16. Few people ever volunteer.  | T | F |
| 17. Employees often eat lunch together.   | T | F |
| 18. Employees generally feel free to ask for a raise.                                   | T | F |
| 19. It is quite a lively place.   | T | F |
| 20. Employees who differ greatly from the others in the organization don't get on well. | T | F |
| 21. Supervisors exact far too much from employees.                                      | T | F |

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- |   |   |   |
|---|---|---|
| 22. It is hard to get people to do any extra work.                    | T | F |
| 23. Employees often talk to each other about their personal problems. | T | F |
| 24. Employees discuss their personal problems with supervisors.       | T | F |
| 25. The work is usually very interesting.                             | T | F |
| 26. Often people make trouble by talking behind others' backs.        | T | F |
| 27. Supervisors stand up for their people.                            | T | F |

Consider the current stresses you are experiencing. Approximately what percentage of these are:

Attributable to your internship/residency? \_\_\_\_\_ percent

Attributable to other sources outside of internship/residency? \_\_\_\_\_ percent

APPENDIX M

# PSI

Code No. \_\_\_\_\_

Research edition

If a statement tends to be true for you, blacken the circle in the column headed T: that is,  T  F  
 If a statement tends to be false for you, blacken the circle in the column headed F: that is,  F  T  
 Please try to answer all questions.

Sex \_\_\_\_\_ Age \_\_\_\_\_ Date \_\_\_\_\_

T	F		T	F
<input type="radio"/>	<input type="radio"/>	1. I enjoy classical music.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	2. I am usually happy.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	3. Being a TV announcer would be fun.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	4. I am happy just being alone.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	5. Shooting is a good sport.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	6. At times I lose all my drive.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	7. I guess I am not very efficient.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	8. I have never broken a major law.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	9. I do not worry about going insane.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	10. Things are always frightening me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	11. Sometimes I don't quite know what to say.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	12. I forget things more quickly nowadays.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	13. People usually understand me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	14. I think carefully about all my actions.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	15. I think there is something wrong with my memory.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	16. I am active in clubs.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	17. I don't get sick very often.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	18. It is fun to bet.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	19. I am rarely at a loss for words.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	20. When I sleep I toss and turn.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	21. I guess I know some pretty undesirable types.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	22. I do not like to gamble.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	23. I often find it hard to concentrate.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	24. I have sometimes drunk too much.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	25. I am sensitive to the needs of others.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	26. I would like to be more outgoing.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	27. I break more laws than many people.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	28. My friends were always welcome at home.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	29. Adults should not shout and yell so much.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	30. As a child I occasionally stole things.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	31. All people tell "white lies."	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	32. I am pretty healthy for my age.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	33. My thoughts are sometimes unusual.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	34. I enjoy the theater.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	35. I take all my responsibilities seriously.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	36. High speeds thrill me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	37. I am tempted to sleep too much.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	38. I do not curse.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	39. Most people are honest with themselves.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	40. I do not like to perform for others.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	41. My health is no problem for me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	42. Sometimes I am no good for anything at all.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	43. Strange voices have spoken to me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	44. I would not like to be an actor.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	45. I have sometimes sat about when I should have been working.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	46. I'm afraid I broke a few rules at school.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	47. Warm relationships are difficult for me.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	48. At times I am a little shy.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	49. I frequently feel nauseated.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	50. My childhood home was happy.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	51. I have sometimes been tempted to hit people.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	52. I was always well behaved in school.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	53. I sometimes get all steamed up.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	54. My appetite is very healthy.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	55. I am extremely persistent.	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	56. I am often tired during the day.	<input type="radio"/>	<input type="radio"/>

- | T                     | F                     |   |
|-----------------------|-----------------------|---|
| <input type="radio"/> | <input type="radio"/> | 57. My school teachers had some problems with me.     |
| <input type="radio"/> | <input type="radio"/> | 58. Odd things have happened to me in my lifetime.    |
| <input type="radio"/> | <input type="radio"/> | 59. I do not like to sit and daydream.                |
| <input type="radio"/> | <input type="radio"/> | 60. Few people win arguments with me.                 |
| <input type="radio"/> | <input type="radio"/> | 61. I am easily distracted from a task.               |
| <input type="radio"/> | <input type="radio"/> | 62. I rarely wake up tired.                           |
| <input type="radio"/> | <input type="radio"/> | 63. People should look after themselves first.        |
| <input type="radio"/> | <input type="radio"/> | 64. Sometimes I am tempted to break something.        |
| <input type="radio"/> | <input type="radio"/> | 65. I have been tempted to leave home.                |
| <input type="radio"/> | <input type="radio"/> | 66. I have no trouble controlling my urges.           |
| <input type="radio"/> | <input type="radio"/> | 67. I am rather a loud-mouth at times.                |
| <input type="radio"/> | <input type="radio"/> | 68. Most people are looking for sympathy.             |
| <input type="radio"/> | <input type="radio"/> | 69. I am a fairly conservative person.                |
| <input type="radio"/> | <input type="radio"/> | 70. Much of my life is uninteresting.                 |
| <input type="radio"/> | <input type="radio"/> | 71. Some people really wish me harm.                  |
| <input type="radio"/> | <input type="radio"/> | 72. My parents like (or liked) my friends.            |
| <input type="radio"/> | <input type="radio"/> | 73. I have little confidence in myself.               |
| <input type="radio"/> | <input type="radio"/> | 74. I seldom feel frightened.                         |
| <input type="radio"/> | <input type="radio"/> | 75. People think I am pretty calm.                    |
| <input type="radio"/> | <input type="radio"/> | 76. Drug addiction is very undesirable.               |
| <input type="radio"/> | <input type="radio"/> | 77. I feel isolated from other people.                |
| <input type="radio"/> | <input type="radio"/> | 78. It is very hard to embarrass me.                  |
| <input type="radio"/> | <input type="radio"/> | 79. I have a lot of energy.                           |
| <input type="radio"/> | <input type="radio"/> | 80. I never act without thinking.                     |
| <input type="radio"/> | <input type="radio"/> | 81. The world has always seemed pretty real.          |
| <input type="radio"/> | <input type="radio"/> | 82. I have avoided people I did not wish to speak to. |
| <input type="radio"/> | <input type="radio"/> | 83. People tend to watch me.                          |
| <input type="radio"/> | <input type="radio"/> | 84. The world is full of odd things.                  |
| <input type="radio"/> | <input type="radio"/> | 85. I like to obey the law.                           |
| <input type="radio"/> | <input type="radio"/> | 86. I have never had a strange mental attack.         |
| <input type="radio"/> | <input type="radio"/> | 87. I always do my work thoroughly.                   |
| <input type="radio"/> | <input type="radio"/> | 88. People generally like to help others.             |
| <input type="radio"/> | <input type="radio"/> | 89. I would make a good leader.                       |
| <input type="radio"/> | <input type="radio"/> | 90. I sometimes feel I am in a world alone.           |
| <input type="radio"/> | <input type="radio"/> | 91. My troubles are not all my fault.                 |
| <input type="radio"/> | <input type="radio"/> | 92. I enjoy talking in front of groups.               |
| <input type="radio"/> | <input type="radio"/> | 93. I find it hard to start a conversation.           |

- | T                     | F                     |   |
|-----------------------|-----------------------|---|
| <input type="radio"/> | <input type="radio"/> | 94. I don't like to rush about.                             |
| <input type="radio"/> | <input type="radio"/> | 95. When I get nervous my hands tremble.                    |
| <input type="radio"/> | <input type="radio"/> | 96. People stop talking when I approach.                    |
| <input type="radio"/> | <input type="radio"/> | 97. Being a racing driver would be fun.                     |
| <input type="radio"/> | <input type="radio"/> | 98. Life treats me badly.                                   |
| <input type="radio"/> | <input type="radio"/> | 99. I have rarely been punished.                            |
| <input type="radio"/> | <input type="radio"/> | 100. My failures are largely due to myself.                 |
| <input type="radio"/> | <input type="radio"/> | 101. I would like to be really important.                   |
| <input type="radio"/> | <input type="radio"/> | 102. I stay away from trouble.                              |
| <input type="radio"/> | <input type="radio"/> | 103. Sometimes I hear noises inside my head.                |
| <input type="radio"/> | <input type="radio"/> | 104. I rarely stumble or trip when I walk.                  |
| <input type="radio"/> | <input type="radio"/> | 105. Many people do not know how sensitive I am.            |
| <input type="radio"/> | <input type="radio"/> | 106. If I don't like somebody, I say so.                    |
| <input type="radio"/> | <input type="radio"/> | 107. My life is definitely worthwhile.                      |
| <input type="radio"/> | <input type="radio"/> | 108. I think carefully about most things I do.              |
| <input type="radio"/> | <input type="radio"/> | 109. I rarely feel anxious in my stomach.                   |
| <input type="radio"/> | <input type="radio"/> | 110. People think I am more immature than I am.             |
| <input type="radio"/> | <input type="radio"/> | 111. At times I feel worn out for no special reason.        |
| <input type="radio"/> | <input type="radio"/> | 112. We should obey every law.                              |
| <input type="radio"/> | <input type="radio"/> | 113. Some of my relatives have done strange things.         |
| <input type="radio"/> | <input type="radio"/> | 114. I am painstaking and thorough.                         |
| <input type="radio"/> | <input type="radio"/> | 115. I rarely or never get headaches.                       |
| <input type="radio"/> | <input type="radio"/> | 116. My parents are (or were) too conservative.             |
| <input type="radio"/> | <input type="radio"/> | 117. I am usually the one to open a conversation.           |
| <input type="radio"/> | <input type="radio"/> | 118. People often embarrass me.                             |
| <input type="radio"/> | <input type="radio"/> | 119. It is very easy for me to make friends.                |
| <input type="radio"/> | <input type="radio"/> | 120. Sometimes the police use unfair tricks.                |
| <input type="radio"/> | <input type="radio"/> | 121. Occasionally I feel dizzy or light-headed.             |
| <input type="radio"/> | <input type="radio"/> | 122. At school I was never easy to manage.                  |
| <input type="radio"/> | <input type="radio"/> | 123. I am extremely talkative.                              |
| <input type="radio"/> | <input type="radio"/> | 124. Some people simply have too much energy.               |
| <input type="radio"/> | <input type="radio"/> | 125. I feel that people keep secrets from me.               |
| <input type="radio"/> | <input type="radio"/> | 126. I like to let others start a conversation.             |
| <input type="radio"/> | <input type="radio"/> | 127. I can usually judge what effect I will have on others. |
| <input type="radio"/> | <input type="radio"/> | 128. My strength often seems to drain away from me.         |
| <input type="radio"/> | <input type="radio"/> | 129. Sometimes I wish I could control myself better.        |
| <input type="radio"/> | <input type="radio"/> | 130. I have a soft voice.                                   |