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The self, life meaning, and behavioral health: An attempt
to reduce susceptibility to stress-related illness through a
psychoeducational enhancement of self-complexity

Hershberger, Paul John, Ph.D.

The Ohio State University, 1989

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THE SELF, LIFE MEANING, AND BEHAVIORAL HEALTH:
AN ATTEMPT TO REDUCE SUSCEPTIBILITY TO STRESS-RELATED
ILLNESS THROUGH A PSYCHOEDUCATIONAL ENHANCEMENT OF
SELF-COMPLEXITY

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of the Ohio State University

By


***

The Ohio State University
1989

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CHAPTER I
INTRODUCTION

The role of psychological factors in the maintenance of health and the onset of disease has been well established over the past few decades (Matarazzo, 1980). A variety of studies have documented that providing psychological services to medical patients can significantly reduce medical costs (Mumford, Schlesinger, Glass, Patrick, & Cuerdon, 1984) and reduce the necessity of medical interventions following surgery (Taenzer, Melzack, & Jeans, 1986). Much less well established in the literature is the cost-effectiveness of psychological interventions regarding the prevention of disease and the enhancement of health. A rather recent body of research (Linville, 1985, 1987) has investigated the complexity of persons' cognitive representations of self as a factor in the susceptibility to stress-related illness. The research described here examines the efficacy of a psychoeducational intervention aimed at increasing self-complexity upon the reduction of the occurrence of stress-related illness. The studies aim to make a contribution to the larger endeavor of determining whether psychological
interventions are cost-effective as disease-preventing and health-enhancing services.

Chapter 2 will review the theoretical and empirical literature relevant to the present research and will describe the studies in detail. Prior to that, this chapter will provide an overview of the general social and scholarly climate which serves as the context for this research.

The Second Health Revolution

The original health revolution occurred in the late 1800s and early 1900s and involved the intense struggle against infectious diseases, such as tuberculosis and pneumonia. During this period of history, mortality due to such disease was the primary health concern (Michael, 1982). During the last half-century, a dramatic shift has occurred in the disease patterns in the United States. Morbidity and mortality rates have dropped significantly for infectious diseases and have risen sharply for chronic diseases, including cardiovascular disease and cancer (Krantz, Grunberg, & Baum, 1985; Matarazzo, 1983). Such illnesses do indeed have a biological component, but these are also lifestyle-related diseases, in that they also have social, environmental, and behavioral etiologies. The percentage of mortality attributed to the top four contributing elements to all causes of death is as follows: 50%-behavioral factors or unhealthy lifestyles;
20%—environmental hazards; 20%—human biological factors; 10%—inadequacies in the existing health care system (Michael, 1982). This shift in disease patterns has led to what has been labeled the "second health revolution," which essentially involves the current focus on disease prevention and health promotion (Michael, 1982). This new emphasis has also been termed the "behavioral health movement" (Ford, 1985).

In many respects, the behavioral health movement is simply a modern expression of the older public health philosophy, which was that it is cheaper and more effective to prevent than to treat disease. Whereas vaccinations were the primary intervention of the prior public health emphasis, the focus now is on fostering behavioral changes which make persons less susceptible to chronic illness (Ford, 1985). Data are available which serve as scientific evidence that certain lifestyle behaviors (e.g., adequate sleep, moderate use of alcohol, no smoking, no overeating, and regular exercise) can act as immunogens and "inoculate" against future illness and premature death. The opposite behaviors (e.g., smoking, overeating to 50% over normal weight, chronically stressed lifestyle known as the "Type A" behavior pattern) practiced over a lifetime and/or during certain critical periods (e.g. pregnancy) can serve as pathogens (Matarazzo, 1983).
The perception of a relationship between personal habits and personal physical health has long been evident in the writings of philosophy and religion and more recently in the medical and psychological literature (Matarazzo, 1983). During the past few decades, the relationship between stress and illness has received much research attention. Over 50 years ago, Selye (1936) noticed an increase in adrenal gland activity and a decrease in immune-system activity in response to stress. This and much subsequent research (Selye, 1976) has led to the development of the new field of behavioral immunology (Maier & Laudenslager, 1985). Holmes and Rahe (1967) pioneered the research which has yielded evidence of a relationship between life changes (self-reported) and physical illness (Sarason, Johnson, & Siegel, 1978). Currently, research evidence is accumulating which suggests that relatively minor events are as important as major life events in accounting for the variance in physical and psychological health (Kiecolt-Glaser et al., 1986). A major concern of the second health revolution is to apply the stress-illness research along with other behavioral health findings to disease prevention and health promotion.

The cost of health care in the United States is the fastest-growing item in today's economy and exceeds 10% of the annual gross national product (Boudewyns & Nolan,
1985; Matarazzo, 1982), yet only 3% of these monies is spent on disease prevention and health education activities (Thoresen & Eagleston, 1985). Thus there is a need for a greater emphasis on reducing the inordinate costs associated with preventable health conditions. The modifiable antecedents of the major causes of disease and death lie mainly in the environment and in patterns of behavior (Kirscht, 1983). While serving as the Assistant Secretary for Health in the United States Department of Health and Human Services, Brandt (1982) argued:

In the years ahead, the greatest advances in health status, the most meaningful improvements in our national quality of life, are likely to accrue from efforts that we, as individuals and as a society, make to improve our health habits and the environments in which we live and work. (p. 1042)

Psychology and Health

Psychology is one of several disciplines that has an opportunity to contribute to the reduction of various health risks. Behavioral health is somewhat unique in that it offers academic, research, and applied opportunities for nearly every psychological specialty. The new "health psychology" specialty does, in fact, include professionals from a wide variety of psychology's subareas (Matarazzo, 1982, 1983). From an economic standpoint, health
psychologists can potentially reduce the cost and the consumption of health care through interventions that reduce risk factors, increase compliance with prescribed medical regimens, and prepare patients psychologically for stressful medical procedures. Effective methods to help individuals institute and maintain positive lifestyle changes would have a profound impact not only on health care costs but on the health of the nation (Boudewyns & Nolan, 1985).

The investigation of psychological factors as variables in the onset of disease typically falls in one of two categories. One approach is to study personality characteristics which potentially predispose individuals to be more susceptible to disease. One example of this is the research on the Type A personality (Matthews, 1982). The other major approach has been to identify social and psychological factors which serve to mediate the impact of stressful events. Much of this work has focused on cognitive processes (Cohen, 1979).

Cognitive factors which have both been studied and targeted in positive health interventions have included the appraisal and interpretation of stressful experience and the attendant self-thoughts in such situations (Thoresen & Eagleston, 1985). Other "self"-related constructs which have been studied include self-concept, self-control, self-efficacy, self-esteem, self-evaluation,
self-management, self-regulation, and self-responsibility (Matarazzo, Weiss, Herd, Miller, & Weiss, 1984). Relatively absent from the literature relating "self"-related constructs to health is work on self-schemas, self-representation, and self-complexity. A recent exception is the research of Linville (1987) with the self-complexity construct.

Aside from Kobasa’s (1979, 1982) research with the "hardiness" construct and Antonovsky’s (1984) work with "sense of coherence", there has been little attempt in the health psychology literature to relate existential issues and health. The concerns of life purpose and meaning are issues where cognition and affect inevitably interact. Such concerns also have a logical relationship to the ways in which a person makes cognitive sense of the self. Investigations studying the relationship between these psychological processes and their impact on health are needed.

As noted earlier, there is insubstantial evidence in the psychological literature to claim that psychological interventions aimed at preventing physical illness are effective and economically beneficial (Matarazzo, 1980). One of the reasons for the scarcity of such relevant investigations is the current state of health care in the United States. Efforts to expand services in the areas of health promotion and disease prevention are frequently not
funded due to cutbacks in general health-care funding (Nelson & Simmons, 1983). Osipow's (1977) observation that, in psychological service settings, remediation tends to drive out prevention where the two are present in the same agency, may also be an accurate analysis of a trend in health care settings. Boudewyns and Nolan (1985) emphasize that psychologists are well-advised to take a much more active role in the development of health care policy. However, research evidence regarding the utility of psychological interventions on the promotion of health is indispensable if such a role is to have much impact, and sufficient research is currently lacking.

Many of the programs that have attempted to be preventive in nature may be broadly defined as psychoeducational, that is, they disseminate psychological knowledge in an instructional or educational format. Such approaches range from instructional, classroom approaches (e.g., Romano, 1984) to rather intensive and personal interventions where teaching a new outlook or process is the specific goal (e.g., Thurman, 1984). Burnell and Taylor (1982) note that the value of such psychoeducational programs as a means of preventing and relieving problems of daily living is gaining gradual acceptance in the medical community. They further argue that educational programs used as adjunctive aids in health maintenance organizations can be cost-effective.
Among the psychological specialties, the area most closely identified with the psychoeducational approach is counseling psychology. Counseling psychology is "a specialty whose practitioners help people improve psychological well-being, resolve crises, and increase ability to solve problems and make decisions" (Fretz, 1982, p. 15). A key characteristic is that the discipline is based on an educative rather than remedial or medical model with a focus on the healthy, functioning aspects of the individual personality (Klippel & DeJoy, 1984; Thoresen & Eagleston, 1985).

At times the counseling psychologist functions as a psychological educator who shares with others "important psychological skills and knowledge needed to help them function more effectively... and to move to higher levels of personal and social development" (Fretz, 1982, p. 18). Ivey (1976) broadly defines the psychoeducator as one who uses many skills, theories, and methods to facilitate human growth. Education, prevention, and remedial treatment are all understood to be functions of the psychoeducator. From the psychoeducational perspective, the person served is analogous to a pupil, not a patient. Typically, work is done with groups as much as, if not more than, with individuals, an important consideration for those interested in cost-effectiveness. Important skills of the psychoeducator include the ability to seek
out the psychological knowledge that is relevant to the identified concern, the ability to plan, design, and structure programs for the dissemination of the information, and the ability to effectively communicate the program information (Watkins, 1985).

Counseling psychology is further grounded in a research orientation which is vital to the area of behavioral health (Klippel & DeJoy, 1984). According to Ford (1985), behavioral health professionals are most likely to come from fields, such as counseling psychology, where training is anchored in learning and developmental processes and strategies. "In the broadest dimension, the counseling psychologist in the psychoeducator model is interested in developing the health environment for its citizens" (Ivey, 1976, p. 74).

The present research takes a psychoeducational approach to health promotion and the prevention of illness. The focus of the intervention is the "self", both from a cognitive and existential perspective. While these studies do not specifically examine the cost-effectiveness of such an intervention, they do aim to evaluate the efficacy of this general approach for the enhancement of health.
CHAPTER II
THEORY, RELATED RESEARCH, AND HYPOTHESES

Following is a review of the literature related to the present research. Regarding the field of behavioral health, issues to be discussed include the stress-illness relationship, disease prevention and health enhancement, and psychological components of positive health behavior. Theoretical and empirical literature concerning the "self" will be surveyed, primarily that work which takes a cognitive perspective. Attention will be given to existential issues and health, particularly the domain of life purpose and meaning. Research relevant to the development of an effective psychoeducational intervention will be examined. Finally, this review will conclude with an integration of the issues discussed with respect to the present research and the specific research hypotheses.

Behavioral Health

Terminology

The terms behavioral medicine, behavioral health, and health psychology are often used interchangably and with little specificity. Matarazzo (1980) has offered definitions of these terms which are widely accepted.
Behavioral medicine is the broad interdisciplinary field of scientific inquiry, education, and practice which concerns itself with health and illness. Behavioral health is an interdisciplinary subspecialty within behavioral medicine specifically concerned with the maintenance of health and the prevention of illness in currently healthy persons. Health psychology is a term encompassing psychology's role in both of these domains. Rogers (1983) advocates the term "preventive health psychology" to denote psychology's specific role in behavioral health. While the label "preventive health psychology" identifies the specific domain of the proposed research, the more widely accepted term "behavioral health" will be used for the purposes of this review. Matarazzo's (1980) formal definition of behavioral health follows:

Behavioral health is an interdisciplinary field dedicated to promoting a philosophy of health that stresses individual responsibility in the application of behavioral and biomedical science knowledge to the maintenance of health and the prevention of illness and dysfunction by a variety of self-initiated individual or shared activities. (p. 813)

As noted previously, the general consensus of the health care system is that the next major step in improving the general health of people in developed countries will be more behavioral than medical (Rogers,
1983). With the focus of behavioral health on prevention and behavior, the term "preventive behavior" also merits definition.

Preventive behavior includes any activity undertaken by a person believing him/herself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic state. ... any behavior that people engage in with the intention of alleviating the potential risks and hazards in their environment (Kirscht, 1983, pp. 277-278).

It is not unusual to find the term "preventive health behavior" used in reference to such behavior. Because this term invites confusion to the extent that it implies "preventing health", in this review preventive behavior will be denoted using the more direct and comprehensive label, "positive health behavior."

Stress and Illness

According to Thoresen and Eagleston (1985), there are three primary models for defining stress. The response model involves the organism's pattern of response to demands or stressors. The stimulus model focuses on the forces or pressures from without (often called stressors) acting upon the person. The transactional model combines the characteristics of the first two models and adds the cognitive dimension.
The response model is best exemplified by the work of Selye (1976). Here, stress is understood as the demand made on an organism to adapt, cope, or adjust. Selye (1976) described the generalized physiological response to such demand as the general adaptation syndrome and outlined a three-stage process: alarm reaction, resistance stage, and exhaustion stage. In centuries past, stressors tended to be time limited and an adaptive response was made in either the alarm reaction or resistance stage. However, many of the stressors of present society are chronic in nature, and such continued stress can lead to what Selye termed "diseases of adaptation," commonly known as stress-related illness.

The stimulus model can be represented by the work of Holmes and Raye (1967) who identify life changes as stressors, or in other words, the stimuli producing stress. This approach originally included both positive and negative life events, but total scores on life change scales do not do a particularly good job of predicting future health problems (Krantz et al., 1985). A better predictor of vulnerability to stress-related illness is negative life change (Gottlieb & Green, 1984; Sarason et al., 1978). It must be remembered, however, that the change labeled as negative results from an interpretation made by the person experiencing the event. The life event approach has been modified to include assessment of
individual appraisal of actual events and begins to reflect the third model of stress, the transactional model.

In the transactional model of stress, cognitive factors are considered in addition to the elements included in the stimulus and response models. Perceptions of the demands of a situation and the appraisal of one's resources to meet those demands are among such cognitive factors. Cognitive appraisal is the process of categorizing an encounter, and its various facets, with respect to its significance for well-being. This procedure goes beyond simple information processing to include an evaluative dimension, that of determining the personal meaning or significance of a situation (Lazarus & Folkman, 1984). Used in a psychological sense, the term "stress" here refers to an internal state of the individual who perceives threats to physical and/or psychological well-being (Lazarus, 1966). Again, the emphasis is on the perception and evaluation of potentially harmful stimuli. According to Thoresen and Eagleston (1985), stress is best conceptualized as an interaction between a specific situation and a particular person in that situation.

It can be useful to identify stressors as falling into one of four categories described by Lazarus and Folkman (1984): 1) acute, time-limited stressors; 2) stressor sequences (e.g., job loss and subsequent
problems); 3) chronic intermittent stressors; and 4) chronic stressors. Of primary concern regarding the impact of stress on the susceptibility to illness is the fourth category, chronic stress, which is a persistent state of hyperarousal manifested behaviorally, cognitively, and physiologically. Such chronic stress may be related to everyday annoyances on the job, at school, or in family relations. Situations such as unemployment, overcrowding, and poverty may be other sources of relentless pressure (Lazarus & Folkman, 1984; Thoresen & Eagleston, 1985).

Behavioral Immunology

A central premise in much of the research looking at the stress-illness relationship is that stress may increase an organism's vulnerability to certain diseases by means of exerting an immunosuppressive effect, especially regarding those diseases intimately associated with immunologic mechanisms (Kiecolt-Glaser et al., 1986; Rogers, Dubey, & Reich, 1979). Animal and human studies in psychoneuroimmunology demonstrate that laboratory and naturalistic stressors can reduce the number of lymphocytes (especially T cells which are vital to cellular immunity), lower the level of interferon (a hormone which facilitates the action of natural killer cells), and cause damage in immunologically related tissue (Krantz et al., 1985; Maier & Laudenslager, 1985; Suter, 1986). Most studies have concurred on the
immunosuppressive effects of stress on cellular immunity (Rogers et al., 1979; Workman & LaVia, 1987), and recent data (Kiecolt-Glaser et al., 1985; 1986) corroborate the hypothesis that cellular immunocompetence may be enhanced through psychological intervention (e.g., relaxation training).

**Mediators**

A wide variety of variables have been studied regarding their mediating effects on the stress-illness relationship. Among these are personality factors, social support, lifestyle behaviors, and cognitive processes.

**Personality factors.** The best known personality factor related to stress and illness is termed the Type A personality. The Type A personality is described as competitive, hard-driving, impatient, time-conscious, workaholic, perfectionistic, and easily angered. This cluster of traits was originally linked to susceptibility to cardiovascular disease. Mixed data have led researchers to examine specific traits, especially the tendency toward anger and hostility, in an effort to delineate the specific maladaptive components of the Type A personality (Dembroski, MacDougall, Williams, & Haney, 1985; Krantz & Manuck, 1984).

From an existential perspective, Kobasa (1979, 1982; Kobasa, Maddi, & Kahn, 1982) has studied the personality construct of hardiness as a mediator of the effects of
stress. It is argued that an existential approach to personality is more conducive to an interest in stress than are more traditional theories of personality, in that the existential approach places an emphasis on persons as "beings-in-the-world." Personality is understood to be constructed through one's actions, rather than being a set of traits. Furthermore, existentialism portrays life as always changing and therefore inevitably stressful. An assumption is that as persons rise to meet the challenges of their environments, stressful events can be changed into opportunities for personal growth.

The construct of hardiness is based upon the existential concepts of commitment, control, and challenge. Commitment is defined as "the ability to believe in the truth, importance, and interest value of who one is and what one is doing and thereby the tendency to involve oneself fully in the many situations of life" (Kobasa, 1982, p. 6). Both the inner- and other-directed aspects of commitment are hypothesized to ward off the illness-provoking effects of stress. The inner commitment to self is related to having an overall sense of purpose in life that mitigates the perceived threat of any given stressful life event in a specific life area. The commitment to the other is related to a sense of community which increases perceived and/or real social support. The concept of control refers to the tendency to believe and
act as if one can influence the course of events in one's life, a concept consistent with Rotter's (1966) locus of control construct. The element of challenge involves the belief that change, rather than stability, is the normative mode of life. New experiences are sought. Challenge is characterized by an openness, or cognitive flexibility, and tolerance toward ambiguity.

Existential personality theory suggests that persons develop strong tendencies toward commitment, control, and challenge if they have experienced in early life considerable breadth and variety of events; stimulation and support for exercising the cognitive capabilities of symbolization, imagination, and judgment; approval and admiration for doing things themselves; and role models who advocate hardiness and show it in their own functioning (Kobasa et al., 1982, p. 176).

Data have been obtained which suggest that hardiness does indeed mediate the effects of stress on health by functioning as a resistance resource (Kobasa et al., 1982; Wiebe & McCallum, 1986). Furthermore, it is suggested that it exerts its effects by changing health practices in addition to the direct health effect, and that hardiness moderates negative effects of stress on health behavior (Wiebe & McCallum, 1986). Hardiness appears to have its greatest health-preserving effect when stressful life
Personality characteristics such as sensation-seeking and arousal-seeking tendencies have received some research attention, but not as much as Type A, hardiness, or the next mediator to be discussed, social support (Cohen & Hoberman, 1983).

**Social support.** Much research has demonstrated that the availability of social support serves to moderate the impact of stress (Antonovsky, 1979; Cohen & Hoberman, 1983; Gottlieb & Green, 1984; Krantz et al., 1985; M. P. Rogers et al., 1979). Essentially, social support refers to the various resources provided by one's interpersonal ties. The key, however, does not seem to be actual social support but rather the perceived availability of social support (Cohen & Hoberman, 1983).

**Lifestyle and health practices.** Coping styles, that is, the things persons do to avoid being harmed by life-strains, are important variables in understanding the stress-illness relationship (Gottlieb & Green, 1984; Krantz et al., 1985; Pardine, Napoli, & Dytell, 1983; Pearlin & Schooler, 1978; Wiebe & McCallum, 1986). For example, when a stressful situation cannot be changed, one may use responses that function to control the meaning of the problem, including making positive comparisons and selective ignoring (Pearlin & Schooler, 1978). Positive health practices (e.g. exercise, adequate sleep, proper
diet, etc.) can make a person more resilient to stress (Coyne & Holroyd, 1982), but stress can also lead to poorer normal health practices (Pardine, Napoli, & Dytell, 1983).

**Cognitive factors.** Individuals' cognitive activities have been shown to play an important role in wellness and the ability to manage stress. Among such processes are appraisal, perceived control, beliefs, attributions, expectations, and self-statements (Kendall & Turk, 1984). From a cognitive perspective, stressor effects are understood to occur only when the situation is appraised as threatening or otherwise demanding (i.e., primary appraisal) and insufficient resources are perceived to be available to cope with the situation (i.e., secondary appraisal). In other words, the causal "event" is the cognitively-mediated emotional response to the objective event, not the objective event in itself (Cohen, Kamarck, & Mermelstein, 1983; Lazarus, 1966; Lazarus & Folkman, 1984). For example, recent work with life changes as stressors focuses on the individual appraisal of a life event, rather than assuming that the change event is stressful in and of itself (Krantz et al., 1985; Sarason et al., 1978).

A major factor in how an event is appraised is the amount of control a person feels regarding the occurrence of the situation and the management of the event.
Perceived control involves attributions of causality and generalized beliefs which form the perceptual set one brings to a situation (Folkman, 1984; Krantz et al., 1985; Lazarus & Folkman, 1984). Furthermore, a person's commitments express what is important to that person and determine what is at stake in a specific stressful encounter. Commitments influence the situations into which a person gets, influence appraisal through shaping one's cue-sensitivities, and the depth of commitments influence the perceived potential harm or threat of a situation. Lazarus and Folkman (1984) suggest that factors such as commitments and beliefs can be brought together into a more general overarching personality concept often referred to as the self. An extended discussion of "self" will follow later in this chapter.

Other factors. Variables such as age, education, and income have been the subject of investigation in the stress-illness literature, particularly regarding their impact on health practices (Gottlieb & Green, 1984). However, relatively little variance in the occurrence of illness is accounted for by these variables. Desirable life events have been viewed as another moderator of the effects of stress (Cohen & Hoberman, 1983).

An important methodological note is made by Cohen (1979) as a reflection on the stress-illness body of research. It is critical to distinguish between illness
and "illness behavior" (e.g., treatment seeking), because some factors may influence illness behavior but not the actual incidence of illness.

To summarize this research literature, no single coping mechanism nor single mediating factor has been found to be so outstandingly effective that its possession alone would ensure the ability to fend off the consequences of stress. Current knowledge would suggest that having a variety of coping mechanisms and effective mediators is more important.

**Preventing Disease and Enhancing Health**

The predominant model in the prevention research has been the biomedical model which focuses on three types of preventive action, primary, secondary, and tertiary prevention. At the primary level, the goal is to prevent disease prior to its occurrence. The secondary level involves the detection of early signs and symptoms of disease and the halting of the disease process. Tertiary prevention refers to treating and halting the further development of disease so as to limit damage and restore the person to normal functioning. This model tends to ignore behavioral and environmental factors which play a role at all three levels (Leventhal & Hirschman, 1982).

Based on a meta-analysis of 40 primary prevention studies, Baker, Swisher, Nadenichek, and Popowicz (1984) conclude that primary prevention interventions do have
promise. However, their review was primarily concerned with only school-related programs. Kirscht (1983) notes that the best documented data concerning preventive behavior deal with rather obvious characteristics of people in relation to quite limited behavioral measures, such as total counts of visits for medical prevention. This points to a problem in this area of research, that being the absence of a consistent definition of health and/or health behavior.

Kaplan (1984) argues that the most suitable outcome measures are those which are capable of combining morbidity (illness) and mortality data. Morbidity might be best assessed through its effects on the quality of life, albeit specificity in this regard is difficult at best. Nonetheless, the point is well taken that health and health status must first be defined before attention can be properly focused on mediators.

Regarding "self" factors, Leventhal and Hirschman (1982) discuss the relationship between self-concept and specific health and risk behaviors. They note that people with a positive sense of self are more likely to look ahead and be concerned with building and preserving their futures, and hence pay greater attention to health-related behaviors. Such persons also have greater self-efficacy expectations regarding such health-related behaviors.
Assumptions and Related Research

Kaplan (1984) has evaluated four assumptions underlying many behavioral approaches in health promotion and the research data regarding these assumptions.

The first assumption is that specific behaviors create risks for serious illness. Of the four assumptions, this is the one most clearly supported by the research evidence. Smoking and alcohol consumption are two behaviors which have been clearly linked to health status. However, there is much less evidence for the efficacy of dietary and exercise modifications on the improvement of health status.

The second assumption is that changes in risk factors cause changes in health status. Here, the evidence is inconclusive. The above-mentioned dietary and exercise research serve as cases in point.

The notion that behavior can be easily changed is the third assumption. This is clearly not supported by the research. Evidence suggests that health behaviors are very recalcitrant. Behavioral interventions tend to have modest rather than strong effects. Long-term success rates are very disappointing. For example, success rates for smoking cessation interventions tend to be between 10-20%.

The fourth assumption is that behavioral programs are cost-effective. Most striking here is the absense of cost-effectiveness studies which consider direct and indirect
monetary costs, costs in time, and other related costs. To date, most of the highly cost-effective programs have been in the area of primary prevention and screening. A major challenge for health psychologists is to demonstrate that their services fall within a reasonable range of cost-effectiveness. Many unanswered research questions remain regarding each of these four assumptions.

Psychological Components of Positive Health Behavior

Efforts to promote positive health behavior frequently assume that attitudes and beliefs can be changed through mass communication and that attitude change will be followed by behavioral change (Kirscht, 1983). However, social psychologists have rather conclusively demonstrated that such a simple assumption is unwarranted (Myers, 1987). A variety of forces promote risky behavior and restrain healthy actions, including socio-cultural norms, the social value of various behaviors, and mass media influence (in the opposite direction) (Kirscht, 1983). The learning theory tenet that immediate rewards and punishments are much more effective than delayed ones also works against health promotion, in that the reward of health likely does not involve any immediate or even noticable change (Krantz et al., 1985).

Lewis and Lewis (1984) have reviewed competencies that correlate with good mental health. While the relationship of these competencies to physical health
remains an empirical question, it seems safe to speculate that they are at least relevant to physical health. The competencies include the capabilities to: build satisfying relationships with others; develop effective cognitive problem-solving skills; manage personal stress; gain access to available resources for help when needed; become involved in productive activities; take responsibility for one's own behavior; and maintain a self-concept that is positive but realistic. People competent in such areas tend to be better able to cope with normal transitional stresses and unexpected crises.

The similarity of these capabilities and factors yet to be discussed regarding positive health behavior should be noted. In fact, Hyner and Melby (1985) argue that while most health promotion/disease prevention programs invariably provide health information, it is increasingly clear that acquisition of a sense of self-control, practical competencies, and social support must be major emphases if health enhancing behaviors are to be adapted. They encourage programs that go beyond the cognitive level and provide opportunities for client self-analysis and introspection.

A variety of social psychological factors have implications for inducing people to make decisions that are conducive to good health. Among these are attributions of causality for desirable and undesirable events,
perceived control versus helplessness, the social power of authority figures, and the commitment and adherence to difficult decisions (Janis & Rodin, 1979). These and other factors are components of the various models of compliance and healthful behaviors which will now be reviewed.

Models of Compliance and Positive Health Behavior

The communication of information regarding positive health behavior is only meaningful to the extent that persons execute such behaviors. The literature on compliance to medical regimens (i.e., direct recommendations of medical professionals) is very discouraging. Non-compliance rates occasionally reach 80-90% in adult populations for problems such as hypertension, albeit the rate is significantly lower for other problems (Leventhal & Hirschman, 1982). Very general statistics averaged over many studies suggest that 50% of patients do not take prescribed medications in accordance with instructions, 20-40% of recommended immunizations are not obtained, and 20-50% of scheduled appointments for treatment are missed. Where changes in habitual behaviors are recommended, even greater non-compliance is found (Kirscht & Rosenstock, 1979). Among the factors which have not been very successful in predicting compliance are personality traits, demographic variables, and general medical knowledge.
Sensenig and Cialdini (1984) have identified four factors which do seem to be related to compliance and applicable to health settings. First of all, commitment and consistency of behavior must be obtained. The commitment should be active, public, effortful, and viewed as internally motivated to maintain consistent behavior. Second, there needs to be social evidence for the efficacy of the compliance behavior. Credibility of the source of information is the third factor. The source needs to be expert and trustworthy. The fourth factor is reciprocal concessions. Where noncompliance is a problem, the reduction of the regimen (concession) may induce patient compliance (concession).

A variety of models have been proposed to explain the process and factors related to positive health behavior and compliance with regimens. A review of the major models follows.

Health Belief Model (HBM). The Health Belief Model (HBM) (Rosenstock, 1974) is a cognitive/psychosocial approach to the explanation of medically-based preventive actions and is the most widely accepted of such approaches. It is based on the premises that "health" is a highly valued concern or goal for most individuals (Janz & Becker, 1984) and that one's perception of the environment determines subsequent behavior (Ross & Guggenheim, 1983). The four primary elements of the HBM have been reviewed
frequently (e.g., Kirscht, 1983; Krantz et al., 1985; Janz & Becker, 1984; Ross & Guggenheim, 1983). These elements are:

1) the perception of susceptibility to disease (personal vulnerability).

2) the belief that the impact of the disease will affect her/him biologically and/or psychologically (perceived severity).

3) the belief that the potential benefits of the regimen (preventive behavior) outweigh the risks of the disease and its treatment.

4) an ability to surmount perceived barriers to the preventive action.

Essentially, the HBM suggests that compliance with a health care regimen can be predicted by considering a person's beliefs about susceptibility, severity, and consequences of an illness, as well as the costs of the regimen and its likelihood of success. The construct validity of the HBM has received wide support (Ross & Guggenheim, 1983).

Janz and Becker (1984) have reviewed 46 HBM studies, and conclude that these data provide substantial support for the usefulness of the HBM as a framework for understanding individuals' health-related decision-making. Predictive results from prospective studies produce higher significance ratios for each of the four dimension
categories than do the retrospective investigations. Each
dimension has been significantly associated with health-
related behaviors under study. The following significance-
ratio orderings ("number of positive and statistically
significant findings for an HBM dimension are divided by
the total number of studies which reported significance
levels for that dimension" [p. 36]) have been compiled:
barriers (89%); susceptibility (81%); benefits (78%); and
severity (65%). The key point here is that perceived
barriers to health-related behaviors account for more of
the variance in such behaviors than do perceived
susceptibility and severity of an illness or the perceived
benefits of the health-related action. Bandura's (1977)
self-efficacy approach (to be discussed later) offers a
way of understanding how a person perceives his/her
ability to surmount barriers.

Bausell (1986) argues that an extension and
elaboration of the Health Belief Model, the Preventive
Behavior Model, can better explain whether or not persons
undertake preventive behaviors. This model includes
factors such as general life satisfaction, personality
factors, and the desirability of the preventive action for
its own sake.

Health locus of control. Rotter's (1966) work with
the construct of locus of control (the degree to which
individuals perceive control of their lives as resting
within themselves or in forces in the outside world) has led to the development of the concept of health locus of control (Kirscht, 1983; Wallston & Wallston, 1982). Essentially, this construct describes the degree to which individuals perceive having control over their own health. Internals appear to attempt to maintain their physical well-being and guard against accidents and disease to a greater extent than externals, but the relationship between health locus of control and positive health behavior is not as strong as one might expect. Furthermore, no strong relationship with compliance to medical regimens has yet been demonstrated (Wallston & Wallston, 1982). Kristiansen and Eiser (1986) found that constructs other than locus of control, values, and social desirability seem to play a more important role in the relationship between health-related attitudes, beliefs, and intentions. Other such factors include attitudinal salience and the perceived relevance of attitudes to behavior. One demonstrated correlation of interest is that there is a tendency for optimists to be more internal in their locus of causality than persons less optimistic (Scheier & Carver, 1985).

**Self-efficacy and social learning theory.** The work of Bandura, both with self-efficacy (1977) and with social learning theory (1978) have spawned perspectives for understanding health behavior.
Stanley and Maddux (1986) propose a model of health enhancement which focuses on the positive consequences of adopting a new behavior rather than on the possible risks associated with continuing current behavior, a model said to be a combination of protection motivation and self-efficacy theory. A few terms require definition for understanding this approach. "Outcome expectancy" refers to the perceived vulnerability for one's current health behavior or the belief that one's current behavior will or will not lead to an appreciable improvement in one's current health status. "Response efficacy" is the belief that an alternative behavior will or will not lead to an improvement in one's health status. "Outcome value" is the expected significance of the results of the alternative health-enhancing behavior. Finally, "self-efficacy expectancies" are beliefs regarding one's ability to carry out the alternative behaviors. While protection motivation theory emphasizes response efficacies and outcome values as prime determinants on health behavior, self-efficacy theory puts greater focus on expectations of personal ability. Stanley and Maddux (1986) combine these approaches and offer data which reveal that both self-efficacy expectancy and response efficacy have significant main effects on subjects' intentions to perform health-enhancing behavior. Correlational data indicate that response efficacy was the best single predictor of
intentions; self-efficacy expectation was also a significant predictor, but outcome value added no predictability.

Thoresen and Eagleston (1985) approach health using an expanded cognitive social learning model. Bandura (1978) emphasizes that behavior must be understood as involving a continuous reciprocal interaction between behavioral, cognitive, and environmental influences. To this model, Thoresen and Eagleston (1985) add physiological processes as a fourth interacting influence. From this perspective, health is viewed as both a dependent and an independent variable and involves all of the above-mentioned influences.

Sense of coherence. Antonovsky (1984) assumes that by late early adulthood (about age 30), individuals have developed a generalized way of looking at the world, and suggests that to understand the process involved in encouraging positive health behavior, generalized resistance resources must be evaluated. This generalized way of looking at the world is termed a "sense of coherence."

A sense of coherence is a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one's internal and external environments are predictable and that there is a high probability that
things will work out as well as can be reasonably expected (Antonovsky, 1979, p. 123).

The three primary components of a sense of coherence are comprehensibility, manageability, and meaningfulness. Comprehensibility is the extent to which individuals perceive stimuli that confront them as making cognitive sense. Manageability is the extent to which people perceive that resources are at their disposal which are adequate to meet the needs posed by stimuli. Meaningfulness is the emotional counterpart of comprehensibility, that is, the extent to which life makes sense emotionally. The hypothesis of this model is that the stronger one’s sense of coherence, the greater the likelihood of maintaining or improving one’s health. The similarity between this and Kobasa’s (1979) hardiness construct should be noted.

**Behavioral approaches.** The models discussed above are primarily cognitive in emphasis. It is important to add that health behavior can be approached from a strictly behavioral point of view. One can examine social factors which serve to reinforce sick role behavior or other risky behavior, and/or factors which facilitate adherence to health-promoting behavior (Kirscht & Rosenstock, 1979). Such a theoretical perspective underlies a variety of behavioral health-enhancing programs, especially weight-reduction and smoking cessation programs (Kirscht, 1983).
In the earlier discussion of cognitive mediators of the stress-illness relationship, it was mentioned that one way to integrate a variety of cognitive factors is to consider the "self", an overarching personality construct (Lazarus & Folkman, 1984). The literature on the self, particularly from the cognitive perspective, will now be reviewed.

The Self

Current work on the self remarkably resembles the early musings about this construct by William James (1890). A pioneer in many respects, James did not view the self as a singular unity but rather spoke of the self as a plurality, an approach which is pervasive in contemporary cognitive social psychology (Greenwald, 1982).

This section will highlight James' (1890) work on the self, discuss relevant "multiple role" research, and review current cognitive approaches to the self.

William James

James (1890) described the "empirical self" as all that a person is tempted to call by the name of "me" as distinct from "mine." The constituents of the empirical self are the material self (body and possessions), the social self (recognition from mates), and the spiritual self (inner or subjective being). These different selves were understood to be in a hierarchical scale "with the
bodily self at the bottom, the spiritual self at the top, and the extra-corporeal material selves and the various social selves between" (p. 313). "In each land of self, material, social, and spiritual, men distinguish between the immediate and actual, and the remote and potential" (p. 315). James found the social selves especially interesting, with the potential social selves most interesting.

"A man has as many social selves as there are individuals who recognize him. He has as many different social selves as there are distinct groups of persons about whose opinion he cares" (p. 294). Regarding persuasion and motivation, James argued that "neither threats nor pleading can move a man unless they touch some of his potential or actual selves" (p. 311). An oft-quoted passage from James (1890) illustrates from a personal point of view how persons invest themselves to varying degrees in various potential or actual selves.

I, who for the time have stated my all on being a psychologist, am mortified if others know much more psychology than I. But I am contented to wallow in the grossest ignorance of Greek. My deficiencies there give me no sense of personal humiliation at all. Had I "pretensions" to be a linguist, it would have been just the reverse. (p. 309)
Gordon Allport (1943) reviewed subsequent work on the self and lamented its disappearance from psychology. His work was largely consistent with James (1890), but involved an expanded analysis. Allport described the self as having eight senses. They can be summarized by viewing ego as: knower, object of knowledge, primitive selfishness, dominance, dominance drive, passive organization of mental processes, fighter for ends, behavioral system, and subjective organization of culture. Allport's primary aim was to bring the self back to good standing in psychology. Greenwald and Pratkanis (1984) have reviewed the connections between James' (1890) and Allport's (1943) work.

In a popular article, Gergen (1972) largely mirrors James and notes that research seems to support James' hypothesis about different social selves. The remarkable flexibility of the self is emphasized, as is doubt that most persons ever find a single, basic self to which they can be true. A given individual has many potential selves and the adaptability of being multi-dimensional is discussed.

This perspective on the self taken by William James and others who have followed his approach has been generally corroborated both in the sociological and social psychological literature.
Multiple Roles

A role is a specified social position accompanied by a set of behavioral expectations or norms. Various roles have varying importance for a given person. Stryker (1980) used the concept of "identity salience" to refer to the relative importance or centrality of a given identity (and thus role) for defining oneself. Role identities are understood to be hierarchically ordered in terms of their probability of being invoked in a given situation. This "probability of invocation" defines identity salience. Stryker (1980) further emphasized that the salience of an identity increases as the commitment to the role which gave rise to that identity increases. This concept of identity salience has its roots in James' (1890) notion of multiple selves, which are differentiated with respect to their importance for self-definition. From Turner's (1978) perspective, a role and person merge when the attitudes and behavior developed as an expression of one role carry over into other situations.

Callero (1985) views the self as a structure of roles, identities, or role-identities. Some role-identities are more a part of the self than others and consequently have a variable effect on the self-concept. The most salient or prominent role-identities are positioned at the top of the hierarchical structure of role-identities. One's self-definition will most likely
reflect salient role-identities, and as such help determine one's overall evaluation of self, or self-esteem. Positive self-esteem is understood to rest on successful performance of salient role-identities.

Hoelter (1983) argues that persons have a need to think well of themselves. Hence, if one evaluates a particular role-identity negatively, it is likely to carry less weight in arriving at an overall self-definition. Using the roles of student, son/daughter, friend, worker, athlete, religious person, and dating person, data from 378 undergraduates suggest that identity salience increases as the evaluation of one's performance within the role giving rise to that identity becomes more positive (Hoelter, 1983). From this point of view, an "A" student is more likely to define self in terms of "student" than is a "D" student. It stands to reason, then, that the more role-identities a person has which can be evaluated positively, the greater the chance of arriving at an overall positive self-evaluation.

A number of studies corroborate the hypothesis that multiple role involvements are beneficial. Spreitzer, Snyder, and Larson (1979) found a clear linear relationship between the number of roles with subjective satisfaction and reports of global well-being in the data from 4505 survey respondents. Thoits (1983) reports that individuals reporting numerous role identities also report
significantly less stress according to data from 720 adult men and women. Roles related to employment, marriage, and parenthood were each associated with good physical health for both women and men in research reported by Verbrugge (1983). Hershberger (1986) found a significant positive relationship between the number of role involvements and the adjustment to bereavement among persons who had experienced the death of a spouse. The most common explanation of these findings is that persons with multiple role involvements are more likely to have roles in which involvement is positively evaluated, and therefore these roles function as sources of self-esteem and life purpose. Another explanation is that more involved people have health attitudes which reduce their sensitivity to symptoms and increase their willingness to take curative health actions. It is also possible that healthy people are better able to acquire and maintain roles more than are unhealthy people. Finally, multiple roles are likely to be associated with greater social support.

These studies suggest that self-multiplicity or self-complexity is indeed adaptive. Stryker and Statham (1985) suggest that the self becomes increasingly complex as the person comes into contact with many other people in a variety of self-relevant situations (i.e., a variety of roles). A number of cognitive approaches to the self will
now be examined to elicit further understanding of the adaptivity of self-complexity.

Cognitive Approaches

The recent cognitive approach to the self has tended to replace the notion of self-concept with that of self-schema. Whereas self-concept implies a rather passive data structure, self-schema involves an active information-processing structure (Greenwald & Pratkanis, 1984).

Greenwald (1980) has defined the self (or ego) as an organization of knowledge that is characterized by cognitive biases analogous to totalitarian information-control strategies. These totalitarian ego biases function to preserve organization in one's cognitive structure. Three such biases are egocentricity, beneffectance (perception of responsibility for desired, but not undesired, outcomes), and cognitive conservatism. Personal history tends to be revised and fabricated, with the past being remembered as if it were a drama in which the self was the leading player. Situations in which a person is ego-involved (i.e., senses personal importance) magnifies these cognitive biases. All three of these biases contribute to self-esteem, but they can also produce cognitive stagnation.

Greenwald and Pratkanis (1984) have reviewed the literature related to the self and subsequently defined the self as a complex, person-specific, central,
attitudinal schema. Their major conclusions are as follows: 1) The self as a knower is accessible to psychological investigation. 2) The self is a central cognitive structure, a self-concept with content that varies from person to person. 3) The self is a focus of affective regard, that is, an attitude object. 4) The self is complex, consisting of diffuse, public, private, and collective facets, each providing a distinct basis for self-evaluation (p. 166). The most prominent feature of the self is the positive affect that is normally attached to one's own actions, attitudes, attributes, and memories.

Building on this work, Greenwald and Breckler (1985) describe the various audiences for the four facets of the self. The diffuse self is essentially a preself, that is, a condition of not distinguishing sharply between self and others. The public self is sensitive to the evaluation of others. The private self is presented to an inner audience. Finally, the collective self looks to group values as norms for self-evaluation. Each of the four facets of the self corresponds to an ego-task, that is, toward the persisting task of establishing one's self-worth by achieving a significant audience's favorable evaluation.

Self-Schema and Possible Selves

Among the most important contemporary work on the self is that of Hazel Markus. Markus' (1977) model of the
self is built upon the notion of self-schemata which are essentially cognitive structures concerning the self. More specifically, self-schemata are cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information contained in an individual's social experience. These schemata "facilitate the processing of information about the self, contain easily retrievable behavioral evidence, provide a basis for confident self-prediction of behavior on schema-related dimensions, and make individuals resistant to counterschemata information" (Markus, 1977, p. 63). This model grew out of the observation that the influence of cognitive structures on the selection and organization of information is most apparent when persons process information about themselves. Markus (1983) asserts that the content and organization of self-knowledge is important because there lies an indication of which domains of behavior are regarded as the most self-relevant; also, self-knowledge cognitively represents both desired and undesired states for the self.

Self-schemas are understood to emerge as an individual actively constructs both generalizations and hypotheses about the self from ongoing life events, an approach similar to the personal construct psychology of George Kelly (1955). Empirical research indicates that
individuals will resist information that is counter to prevailing self-schemas, and that self-schemas will structure the course of interpersonal behavior by selectively focusing attention on the self-relevant features of a given social situation. Here lies the major argument of this model which is that the content and organization of self-knowledge can be importantly revealing of future behavior (Markus, 1983). Self-knowledge that can be abstracted, symbolized, and articulated is particularly significant because it can be communicated to others and thus represents those aspects of self that are likely to have the most impact on social behavior. Acquiring a self-schema is essentially equivalent to staking out a personal claim in a given behavioral arena. In the course of selecting certain arenas in which to monitor and regulate one's behavior, one is constructing an identity in a very real sense.

Self-schemata are not only passive generalizations of past action, but also a claim of responsibility for one's present and future behavior in these given domains. They essentially define future selves, which Markus (1983) labels "possible selves." Possible selves are individuals' ideas about what they might become, what they would like to become, and what they are afraid of becoming. They represent a link between self-concept and motivation, functioning both as incentives for future
behavior and as a context within which to evaluate one's current perception of self (Markus & Nurius, 1986). Each identity or self-conception has a particular affect attached to it. Self-esteem is a variable value that is a function of the valences (affect) of the self-conceptions comprising the working self-concept at a given time. Subcategories of possible selves (i.e., "ever-considered" selves, "probable" selves, "like-to-be" selves), along with the "now" self, all contribute to the variance in measures of self-esteem, negative affect, and hopelessness.

In a study with crisis victims who had rather negative "now" selves, good recovery was associated with those who had positive future selves while poor recovery was associated with those who had negative future selves (Markus & Nurius, 1986). Markus and Nurius (1986) suggest that "if possible selves are assumed to function as incentives for behavior, it is necessary to work with individuals so that they generate self-conceptions of possibility to support the positive self-statements developed in therapy" (p. 965).

One hypothesis that remains in need of empirical research is the notion that perhaps the more self-schemas an individual develops, the more articulated the cognitive self becomes and the more able one becomes to exert control over behavior. One also could surmise that the
more self-schemas and "possible selves" an individual develops, the more likely one is able to maintain self-esteem from those which have positive affective valences.

Self-Consciousness

The term "self-consciousness" has been used to refer to the consistent tendency of persons to direct attention inward or outward (Fenigstein, Scheier, & Buss, 1975). The development of this construct involved devising a scale to measure two separate aspects of self-consciousness, private and public self-consciousness. Private self-consciousness involves a cognitive, private mulling over the self, and attending to one's inner thoughts and feelings. Public self-consciousness refers to the awareness and concern over the self as a social stimulus.

Mullen and Suls (1982) found that the health of persons high in private self-consciousness was unaffected by the incidence of undesirable, uncontrollable life events, but persons low in private self-consciousness became more susceptible to illness subsequent to the accumulation of such events. They suggest that persons high in private self-consciousness are more likely to notice their psychological and somatic reactions to stressful situations and respond through actions which ameliorate their reactions to stressors. Furthermore, persons high in private self-consciousness are more likely to attend to changes in internal bodily states, to be more
accurate in their evaluation of them, and to reduce discrepancies between their current states and salient standards. These results are consistent with Kobasa's (1982) work with the hardiness construct to the extent that commitment to self serves as a stress resistance resource.

Flanders and McNamara (1984) report a three times greater correlation between self-efficacy and compliance with acne medication regimens for self-focused subjects than for non-self focused subjects. While this finding was not statistically significant (only 28 subjects were included in their study), it does suggest that private self-consciousness may be a factor enhancing positive health behavior.

Self as Prototype

A prototype is "a collection of the most typical or highly related features associated with a category label and is thought to function as a standard around which a body of input is compared and in relation to which new input is assimilated" (Rogers, Rogers, & Kuiper, 1979, p. 53). Rogers (1981) postulates that the self is a prototype that contains a collection of features the person sees as describing him or her. This model of the self has grown out of research which has found a bias to perceive new, self-descriptive adjectives as having been previously seen. In a recognition memory study involving personal
adjectives, the number of "false alarms" (saying an item was in a study list when it was not) was found to increase with the degree of self-reference of the adjectives. These results were interpreted as evidence that the self is an important aspect of processing personal information and that the self functions as a cognitive prototype. This approach to the self, therefore, suggests that the self functions as a large and complex prototype that imparts a bias in processing personal information.

**Self-Complexity**

The model of the self utilized by the present research is Linville's (1985; 1987) work with self-complexity. Self-complexity is defined as the number of non-redundant aspects by which the self is cognitively represented. The original model suggested that complexity of self-representation is related to affective variability. The basic hypothesis was that less complex self-representation is related to more extreme affect and self-appraisal. Greater complexity of self-representation involves organizing self-knowledge in terms of a greater number of aspects that are relatively independent of one another. There were four basic assumptions of the original model.

1) The self is cognitively represented in terms of multiple aspects, including social roles, interpersonal relationships, specific events/behavior, traits,
abilities, pretences, goals, autobiographical recollections, and so forth. It is assumed that persons probably possess a greater amount of information about the self than any other cognitive domain, and that self-relevant information in the environment is relatively salient and gains our attention. According to Linville (1985), "the richness of self-knowledge demands not a unitary cognitive structure, but one housing many concepts and distinctions corresponding to various roles and aspects of the self" (p. 96). This approach to the self is compatible with Markus' (1977; 1983) work with self-schemas and the model of the self as a prototype (T. B. Rogers et al., 1979), both discussed above. In addition, it is consistent with the model of the self as a system of nodes in an associative network (Bower & Gilligan, 1979) and the self as multidimensional trait space (Greenwald and Pratkanis, 1984).

2) Self-aspects vary in the affect associated with them. This assumption matches Hoelter's (1983) assertion that various role identities impact overall self-definition with varying weight, depending upon one's evaluation of performance in the respective roles.

3) People differ in the degree of complexity of their self-representation. Self-complexity involves both the number of aspects included in self-representation as well as the degree of relatedness of the aspects. A self-aspect
is a self-relevant cognitive category, concept, or schema, and is, in part, a function of the number of roles a person has in life. An aspect is distinctive to the extent that success or failure in that aspect has minimal implications for feeling or self-evaluation in other aspects. The relatedness of aspects is a function of actual covariation or correlation, as well as perceived covariation. Greater spill-over between aspects is characteristic of the person with simple self-representation. Self-representation tends to develop over time with increasing use, information, and range of experience relevant to the self into a more differentiated structure. Such a developmental pattern is consistent with theories of cognitive development (e.g., Piaget, 1960). In summary, self-complexity refers to the number of non-redundant or distinctive attributes comprising the cognitive representation of the self.

4) Overall affect and self-appraisal are a function of the affect and self-appraisal associated with different aspects of the self. This model is an averaging model, where overall affect is the weighted average of the affect and self-appraisal associated with individual aspects.

Linville (1985) reports the results of two studies carried out to test the hypothesis that greater self-complexity acts to moderate swings in mood and self-appraisal. In the first experiment, success or failure
feedback was experimentally manipulated and a significant self-complexity by feedback interaction was found. Lower self-complexity was clearly linked with greater negative reaction after failure, and more weakly linked, but in the expected direction, with greater positive reaction after success. In the second study, undergraduate women lower in self-complexity experienced greater variability in affect over a two-week period.

More recently, Linville (1987) extended the self-complexity and affective extremity hypothesis to suggest that self-complexity serves as a buffer against the adverse consequences of stress on mental and physical health. This hypothesis is based upon the assumption that for people who maintain more self-aspects and greater distinctions among self-aspects, the impact of a negative event is more likely to be limited to a smaller proportion of their self-representation. These people are more likely to be able to maintain positive thoughts about the unaffected self-aspects.

Linville (1987) describes a possible scenario regarding the self-complexity buffering hypothesis.

Experiencing negative stressful events triggers negative thoughts and feelings associated with various self-aspects. These, in turn, contribute to negative affect, low self-appraisal, depression, and other stress reactions including physiological
responses. These may ultimately influence physical health outcomes through neuroendocrine or immune system functioning, maladaptive health-related behaviors, and failure to seek medical care.

(p. 665)

In a study measuring stressful events, self-complexity, depression, and illness in two sessions separated by two weeks, Linville (1987) obtained the following results: 1) Greater self-complexity acts as a moderator of depression and illness when people are under high stress. 2) Greater self-complexity buffers against those types of health outcomes that are related to stress in the sample tested (e.g., respiratory flu, backaches, headaches). 3) Self-complexity is a stronger moderator of stress-related depression and illness than is a simple count of the number of self-aspects (i.e., ignoring the distinctiveness of self-aspects). 4) High self-complexity was mainly beneficial to those under high stress. At low levels of stress, lower self-complexity was related to fewer physical and mental health symptoms.

This crossover interaction (low self-complexity being advantageous at low levels of stressful events and higher self-complexity being advantageous at higher levels of stress) is explained in two ways. First, if the absence of negative events is experienced as a positive state of affairs, then the self-complexity—affective extremity
hypothesis suggests that those low in self-complexity may experience more positive affect in the absence of stressful events. Second, maintaining multiple distinct self-aspects may be a source of chronic, low-level stress, perhaps because of role conflicts or multiple demands on time and attention. The finding that self-complexity has its greatest positive effects when stress mounts is similar to Kobasa's (1982) notion that hardiness has its greatest buffering effects in high-stress situations.

Although Linville (1987) suggests that self-complexity need not be associated with cognitive complexity in other domains, research with the construct of conceptual complexity merits mention. Bruch, Juster, and Kuethe (1985) suggest that persons with lower levels of conceptual complexity utilize more fixed and simplistic schemata that may lead to more invariant interpretations of situations, as well as produce an inability to interrelate seemingly dissonant properties of situations. Their research suggested that low conceptual complexity individuals were more prone to extreme self-judgments of both a negative and positive nature, a finding consistent with Linville's (1985) self-complexity and affective extremity hypothesis.

Other Relevant Theories

Two theories which in actuality are not theories of the self, but are relevant to models of the self and the
present research, are control theory and valuation theory.

Carver and Scheier (1982) describe control theory (also known as cybernetic theory) as a metatheoretical approach to understanding self-regulating systems. The basic unit of cybernetic control is known as the negative feedback loop, whose function is to negate, or reduce, perceived deviations from a comparison value. A present condition is perceived (input function). This perception is then compared to a point of reference. If a discrepancy is perceived between the present state and the reference value, a behavior is performed (output function), the goal of which is to reduce the discrepancy. Behavior impacts the system's environment (or perception thereof) to create a change in the present condition. The standard for comparison comes from a hierarchically organized system, and is specified as the output of a feedback loop at the next higher level of analysis. The hierarchically organized system has both superordinate and subordinate goals. Attainment of the latter are requisite to --- and intimately involved in --- attainment of the former. A superordinate system "behaves" by providing reference values to feedback systems at the next lower level of the hierarchy.

The characterization of the self-regulatory events that follow from self-focus has two aspects. First of all,
there is an assumption that self-directed attention results in an increased tendency to compare one's present state with relevant and salient reference values. Second, self-focus promotes enhanced self-regulation. Roles can serve as reference values, for they represent a major class of organized knowledge structures, tied in large measure to social definitions of situations and incorporating behavioral prescriptions and proscriptions.

Regarding health psychology, good health might constitute a reference value. To the extent that such a reference value is salient and self-relevant, attention to this value would play a role in the self-regulation of health-relevant behavior.

With reference to the hierarchical structure, one could assume that self-aspects most central in one's overall self-definition serve as superordinate values or goals. This is consistent with Callero's (1985) emphasis that role-identity salience is a prominent factor in the formation of self-definition and overall self-evaluation.

Turning to valuation theory, the basic postulate is that valuation is a process of the self (Hermans, 1987). Valuation is the selecting, interpreting, and organizing process of the self-as-knower. Anything a person finds to be of importance (having personal value or meaning) in his or her life situation can be conceived of as a valuation.
An assumption of the theory is that each valuation has an affective component and that a valuation system is organized affectively. More influential valuations have more generalizing influence over the system. This approach fits with Kelly's (1955) personal construct theory in which the increasing importance of personal constructs involves increasing generalizability in the construct system.

Valuation theory is important to the present review and research for at least two reasons. First of all, thinking of self-aspects as valuations is a way to incorporate both the cognitive schematic and affective evaluation components of self-aspects under one construct. In the second place, valuation theory can be a useful conceptual link between the literature on the self and the existential literature to be discussed next. Viewing self-aspects as valuations can be a beginning point for understanding how the cognitive processes involved in self-representation impact the existential process of making meaning out of experience and finding a sense of purpose for life.

Existential Issues

The existential perspective regarding the self and the health of the individual emphasizes that meaning is essential for life. Frankl (1984) argued that the striving to find a meaning in one's life is the primary human
motivational force. Of particular relevance to the present research is the means through which persons achieve a sense of meaning and purpose for life.

Yalom (1980) suggests that Hume, Sartre, Camus, and Tolstoy all choose engagement as the solution to the philosophical problem of meaningless, and himself purports engagement as the therapeutic answer to the problem. According to Yalom (1980), "wholehearted engagement in any of the infinite array of life's activities... enhances the possibility of one's completing the patterning of the events of one's life in some coherent fashion" (p. 482).

Meaning and Purpose

Yalom (1980) specifies that the term "meaning" refers to making sense or coherence out of experience, while "purpose" refers to intentions, aims, or functions. However, these terms are commonly used synonymously in everyday language and interchangably in much of the literature.

One research endeavor with regard to life meaning has been the attempt to categorize the types of engagements through which people find meaning. From a theoretical perspective, Frankl (1984) identified three general categories of meaning: 1) creativity - accomplishments and gifts to the world; 2) experiential - encounters and experiences one takes from the world; and 3) attitudinal - one's stand toward the issue of suffering. Yalom (1980)
also offers a list of categories of activities that provide human beings with a sense of purpose. This list includes altruism, dedication to a cause, creativity, hedonism, self-actualization, and self-transcendence.

A much more empirical approach to the task of identifying meaning categories is the research of DeVogler and Ebersole (1980, 1981; Ebersole & DeVogler, 1981). Their approach involves asking subjects to write about the most meaningful things in their lives and then identify common categories for these meanings. Both subjects themselves and/or independent raters have done the categorization. Consistently, the category of "relationships" is most often reported (from 30-51% of subjects find meaning in their relationships). Other categories that have been identified include belief, growth, life work, pleasure, service, obtaining, and health. In their studies, no more than 5% of subjects have ever reported "no meaning."

Usually subjects are asked for either the "most important" or "three most important" life meanings. When subjects were not limited to a certain number of meanings, an average of 4.26 meanings were reported, implying that people do not prefer just one meaning in life (DeVogler-Ebersole & Ebersole, 1985). Although their interpretation is that multiple meanings may involve shallowness in pursuit and fulfillment of each meaning, it may also be
hypothesized that multiple meanings make it more likely that one can formulate an overall sense of purpose in life. The latter notion would be most consistent with the literature on the self, reviewed earlier.

A second general research approach regarding life meaning has been to measure the strength of persons' sense of purpose in life. The primary instrument used in this research effort has been the Purpose-In-Life (PIL) test, devised by Crumbaugh and Maholick (1969). The aim of the instrument is to measure "existential vacuum", which, according to Frankl (1984), is the result when one fails to find a meaning and purpose which gives her/his life a sense of unique identity. Yalom (1980) has reviewed a number of variables which have been correlated with PIL scores. Of particular interest is that several studies have demonstrated that high PIL scores are correlated with involvement in organized groups, an obvious form of engagement. Generally, the research seems to suggest that positive life meaning "is dependent upon some fit between one's goals and values and the roles and needs of the social structure in which one is enmeshed" (Yalom, 1980, p. 459). Furthermore, the absence of a sense of meaning in life is associated with psychopathology.

The existential construct of "hardiness", discussed earlier (Kobasa, 1982; Kobasa et al., 1982), has been found to function as a resistance resource regarding the effect
of stressful life events. While this construct isn’t directly concerned with meaning or purpose, it’s core components (commitment, control, and challenge) would appear to be related to a sense of life meaning.

Psychoeducational Intervention and Primary Prevention

Primary prevention efforts typically take the form of educational programs where information related to health is presented (Kirscht & Rosenstock, 1979). The goal of such efforts is to have persons process this information and subsequently change health-related behavior. The dynamics of persuasion are at the core of this process. While a thorough review of the social psychological literature on the subject of persuasion will not be attempted here, some key elements from this literature merit review.

A relatively recent theory of persuasion has been formulated which has been found to be quite useful in accounting for a variety of effects found in the persuasion research. Much research has confirmed the predictions of the theory (Myers, 1987). The theory is known as the elaboration likelihood model of persuasion (ELM) (Petty & Cacioppo, 1986). Essentially, the ELM differentiates influence that results mostly from a person’s thoughtful consideration of the central merits of an issue (central route processing) from influence that
results mostly from simple peripheral cues that can affect agreement in the absence of argument scrutiny (peripheral route processing). This distinction involves high ego involvement versus low ego involvement, respectively. Central route processing is motivated (ego involved) and involves an individual’s cognitive processing of the topic and content of a persuasive message. The person’s own thoughts about the topic and personal evaluation of the arguments are central to this process. Peripheral route processing is not motivated (no ego involvement) and the individual does not think about the persuasive message. The effect of the information is based on cues in the context. Central route processing is more difficult to obtain, but is more long-lasting and appears to influence behavior more strongly. Attitude change resulting from peripheral processing tends not to endure when the influential cue is no longer present. Hence, for a message to be persuasive, the receiver needs to be ego involved and able to cognitively process the information. An effective psychoeducational intervention is likely to require central route processing.

Since the present research utilizes a psychoeducational intervention, broadly defined, designed to impact cognitive self-representations, cognitive biases regarding the self must be considered if central route processing is to occur. In fact, Greenwald and Pratkanis
(1984) view the self as an attitude object. The tendency toward cognitive conservatism (Greenwald, 1980) will function to resist any altering of self-representations. However, self-serving biases and other tendencies to think of the self positively could work to enhance central route processing of information said to enhance the structuring of self-representation. In this regard, an intervention which is able to increase persons' sense of responsibility for good health can capitalize on the "beneffectance" bias (Greenwald, 1980).

In their research with the self as a cognitive prototype, T. B. Rogers and others (1979) found that there is a bias to perceive new, self-descriptive adjectives as having been previously seen. The related self-reference effect describes the observation that words judged for self-descriptiveness were better recalled than words judged on other dimensions or judged with respect to other persons (Rogers, Kuiper, & Kirker, 1977). These tendencies could serve to enhance the cognitive processing of suggested new categories for self representation. In fact, Rogers (1981) contends that involvement of the self during the encoding process produces more elaborative encoding which results in a larger and richer set of associative paths for retrieval. The self-relevance of the presented information should enhance central route processing.
Gregory, Cialdini, and Carpenter (1982) found that subjects who were led to imagine themselves experiencing certain events came to believe more strongly that the events would befall them. This tendency was found with both positive and negative events and in both laboratory and field studies. In their research, the positive effect of structured scenarios on compliance behaviors was not understood to be due to the additional information, but rather to the availability heuristic (e.g., Tversky & Kahneman, 1982), whereby this new, self-relevant information "springs to mind" easily. Regarding self-representation, these results would lead to the hypothesis that having subjects think of themselves in more cognitively complex, self-relevant ways should increase the likelihood that they would subsequently think of themselves in these more complex ways.

Integration and Hypotheses

This chapter has reviewed literature in the areas of behavioral health, cognitive models of the self, meaning/purpose in life, and elements of psychoeducational intervention. While the disparate nature of these domains would argue against discussion of each in the same literature review, a major purpose of the present research is to further explore the interrelatedness of the areas. In the research of the relationship between stress and illness, cognitive factors are currently receiving
much attention regarding their role as mediators (Krantz et al., 1985; Lazarus & Folkman, 1984). While it seems logical that the cognitive representation of the self would serve as a pivotal point for the cognitive processing of an event appraised as stressful and for the processing of the resources available to oneself to cope with the event, very little attention has been given to the cognitive structuring of self as a factor in the stress-illness literature (Matarazzo et al., 1984). An exception is the work of Linville (1985, 1987) with the construct of self-complexity, and her research serves as a point of departure for the present research.

Linville’s research has utilized the self-complexity construct as an independent variable. The research described here will also examine the construct as a dependent variable. In other words, can self-complexity be enhanced through a psychoeducational intervention? Although Linville (1985) argues that self-complexity is something that develops over time and cannot be quickly changed, she does envision interventions designed to increase self-complexity.

To the degree that cognitive representations (of the self) are therapeutically manipulable, this work suggests therapeutic intervention emphasizing self-complexity. Such an intervention might attempt to emphasize or develop a more differentiated view of
the self, in which feelings about various self-aspects are relatively distinct. (Linville, 1985, p. 118)

Linville's (1985, 1987) pioneering work has taken the major elements of the work on the self as a cognitive structure and demonstrated a relevant application in the areas of mental and physical health. The present research builds upon this application of the "self" literature.

While the "self-complexity -- affective extremity" hypothesis (Linville, 1985) offers one explanation of the process whereby self-complexity can reduce susceptibility to stress-related illness, other possibilities exist. Two examples are that 1) self-complexity increases one's sense of meaning in life making the person better able to cope with stress and 2) self-complexity leads to greater compliance with prevention regimens and positive health behaviors.

Relatively little research has been done relating existential issues and health. An exception is the work of Kobasa (1979, 1982; Kobasa et al., 1982) with the existential construct of hardiness. This literature can enhance understanding of the potential positive impact of self-complexity on life meaning. The "hardy" person is said to have a sense of commitment, a sense of control, and a sense of challenge. While roles provide behavioral
expectations or norms (Myers, 1987), involvement in a variety of roles can provide a sense of commitment, and serve as sources of purpose for existence. Successful performance in such roles can lead to greater self-efficacy in those roles and in this way foster a sense of control over one’s existence. Role conflict is an inevitable occurrence with a variety of roles (Myers, 1987) and the need to resolve such conflict and balance a variety of expectations is an ongoing challenge. To the extent that a variety of role involvements is a reflection of self-complexity, a relationship can be seen between multiple role involvements and hardiness, an existential construct that has been positively associated with health.

Factors related to positive health behavior have been reviewed. Among these is having a sense of personal control (Janis & Rodin, 1979). Having a variety of perceived competencies and the concomitant sense of control may enhance the individual’s belief that she/he can carry out positive health behaviors and that they will have a beneficial impact upon well-being. Once again, Bandura’s (1977) self-efficacy model would support this notion.

The present research examines the possibility that a psychoeducational intervention can increase self-complexity, reduce susceptibility to stress-related illness, increase positive health behaviors, and have a
positive impact on life meaning. Specific hypotheses tested will now be reviewed.

Hypotheses

While Linville (1987) has demonstrated a relationship between self-complexity and less susceptibility to stress-related illness for persons under stress, it remains to be seen whether or not self-complexity can be manipulated. It would be expected that a person who adds additional role involvements would increase in self-complexity. However, the present research is limited to attempting to increase self-complexity through a cognitive exercise. In other words, can a person be taught to think about one’s current self (with current involvements) in a more complex way? Biases involved in the cognitive processing of self-relevant information increases the likelihood of increasing self-complexity through a cognitive intervention.

Ho 1: Self-complexity will increase as the result of a cognitive intervention, in the absence of any intentional initiation of behavioral changes.

While it might be expected that information about the self-complexity—health hypothesis alone would impact self-complexity, it is predicted that engagement in a cognitive exercise aimed at expanding self-representations will yield a greater increase in self-complexity. The combination of both information and a self-relevant
exercise is predicted to result in the greatest increase of self-complexity. Figure 1 depicts the hypothesized results of four intervention levels.

Ho 1a: Information imparted about the self-complexity—health relationship will result in an increase in measured self-complexity. Involvement in a cognitive exercise will yield a greater increase in self-complexity than will information alone. Both information and involvement in the exercise will result in the greatest increase in self-complexity.

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**Figure 1**

*Hypothesized Effect of Psychoeducational Interventions on Self-Complexity*
While the possibility of increasing self-complexity through a cognitive, psychoeducational intervention alone has relevance to the building of the literature regarding the self-complexity construct, the more important concern of the present research is the effect on susceptibility to stress-related illness. The purpose of attempting to increase the self-complexity of persons under stress is to lower their susceptibility to stress-related illness.

Ho 2: The increase of self-complexity of persons under stress will be accompanied by reduced occurrence of stress-related illness.

Once again, information about the self-complexity-illness hypothesis alone could result in an increase in self-complexity and lowering of the incidence of stress-related illness. Involvement in a cognitive exercise is likely to result in greater changes, while the greatest changes are predicted to occur with the combination of information and exercise.

Ho 2a: Involvement in a cognitive exercise designed to increase self-complexity will result in a lower incidence of stress-related illness than when information about the self-complexity-illness hypothesis is simply imparted. The combination of information and involvement in the exercise will result in the greatest decrease in the occurrence of stress-related illness.
The literature related to the benefits of multiple role involvements, to the relationship between high PIL scorers and involvement in organizations, and to subjects reporting multiple meanings in life, seems to suggest that having a variety of behavioral involvements is related to life purpose and quite possibly to health. Of concern in the present research is whether cognitive engagements related to self-representation can serve a similar function. In other words, can thinking about oneself as having a greater number and variety of engagements positively enhance life meaning and health?

**Ho 3:** Self-complexity is positively correlated with a sense of purpose in life and with the number of reported sources of life meaning.

**Ho 3a:** Increases in self-complexity will be accompanied by an increase in a sense of purpose in life and an increase in the number of reported sources of life meaning.

**Ho 4:** Occurrences of stress-related illness will be inversely related to a sense of purpose in life and to the number of reported sources of life meaning.

As mentioned earlier, one way in which self-complexity may positively enhance health is that persons higher in self-complexity may behave in more healthful ways, including compliance with medical regimens. Such a proposal is based upon the notion that greater self-
complexity may be associated with factors such as a sense of self-control, practical competencies, and available social support, factors that have been identified as being conducive to effective health-enhancing programs (Hyner & Melby, 1985). If this is the case, one of the health benefits of increasing self-complexity would be to increase compliance with behaviors associated with health.

Ho 5: Self-complexity is positively associated with compliance with measured positive health behaviors.

Ho 5a: Increased self-complexity will be accompanied by an increase in compliance with measured positive health behaviors.

It is important to once again emphasize that Linville (1987) has found that for persons under low stress, lower self-complexity appears to be more adaptive. Hence, the above hypotheses will be tested with regard to persons at or above a determined level of stress.

Conclusion

In the introductory chapter and in this chapter's review of the literature in the field of behavioral health, it has been noted that expected advances in health in the United States are likely to accrue from behavioral and environmental changes. In this context, the literature on cognitive self-representation has been reviewed with the goal of understanding how this knowledge might be
applied to the enhancement of health. In a secondary way, literature on the existential concern of life purpose and meaning has been discussed regarding its theoretical relationship to cognitive self-representation and health. Expanding on the promising research of Linville (1985, 1987), hypotheses have been generated concerning the usefulness of a psychoeducational intervention aimed at increasing the self-complexity of persons under stress. The next chapter will describe a study designed to test the hypotheses that have been proposed and Chapter 4 describes a supplemental study which involves the inclusion of self-complexity information in a stress management seminar context.
CHAPTER III
EXPERIMENT ONE

Method

Subjects
A total of 110 undergraduates taking introductory psychology participated in this study. This sample included 71 females and 39 males with an overall mean age of 19.3 (SD = 2.2). These 110 subjects were among those who scored at or above the mean on either (or both) the Life Experiences Survey (LES) or the Perceived Stress Scale (PSS) from an original screening group of 333 undergraduates. The sample of 110 represents those students who accepted the invitation to participate further in the study and subsequently completed all requirements. (Complete data was not obtained from 16 additional subjects who were also part of the sample at the outset. Reasons for this included failure to attend one of the sessions, losing/forgetting the assigned code, withdrawing from school, and failing to correctly complete one or more of the measures. These 16 subjects did not differ significantly on any of the Time 1 measures.) This procedure was utilized to yield a sample of undergraduates.
who were experiencing an average or above average level of stress. For their participation, subjects received credit toward the experimental requirement of the introductory course.

Measures

Subjects initially completed measures of recent life events and perceived stress as part of the screening procedure. These measures, as well as the measures of other variables subsequently collected, were completed a second time at the end of the study.

Life Changes

The Life Experiences Survey (LES) (Sarason et al., 1978) was utilized as one measure of life stress. It is a 57-item self-report measure that allows respondents to indicate events that have been experienced during a given preceding period of time. Items include life changes common to individuals in a wide variety of situations and 10 events commonly experienced by students. Thirty-four of the events listed in the LES are similar in content to those found in the Schedule of Recent Experiences (Holmes & Rahe, 1967). The LES format asks respondents to rate the impact of events that have been experienced. Ratings are on a 7-point scale ranging from extremely negative (−3) to extremely positive (+3). Both a positive change score (summing the impact ratings of those events rated as positive) and a negative change score (summing the impact
ratings of those events rated as negative) may be obtained. Adding these two values yields a total change score. Because recent research (discussed earlier) suggests that indices of negative change are better predictors of health-related variables than are total change scores, the negative change score was utilized in the present research. Three LES items measure health behavior departures which may be a consequence of stress rather than an actual stressful event. These items, "major change in eating habits," "major change in sleeping habits," and "major change in usual or amount of recreation," overlap with other measures of health and health behavior and therefore were deleted. Also, separate items regarding changes in the husband's or wife's work were combined into a single item regarding changes in the spouse's work. These changes result in a 53-item scale, with three additional spaces provided for the inclusion of events not mentioned on the scale. For this study, subjects were asked to respond to items with reference to the preceding six months.

Two test-retest reliability studies with a 5-6 week time interval yielded reliability coefficients for the negative change score of .56 (N=34, p<.001) and .88 (N=58, p<.001). The authors further report that the LES has been found to be relatively free from the influence of social desirability response bias.
There is precedent for using this instrument as a measure of stress in health-related studies. The LES negative change score (excluding the three health behavior items) was used by Wiebe and McCallum (1986) in a study of health practices and hardiness as stress-illness mediators.

**Perceived Stress**

The Perceived Stress Scale (PSS) (Cohen et al., 1983) was used as a measure of the degree to which situations in one's life are appraised as stressful. The PSS is a 14-item self-report inventory designed to tap the extent to which respondents find their lives unpredictable, uncontrollable, and overloading. For each item, subjects rate how often during the past 2 weeks they felt a certain way. Responses are made on a 5-point scale (never, almost never, sometimes, fairly often, very often). In three validation samples, coefficient alpha reliability was .84, .85, and .86. Two-day test-retest reliability was .85.

**Self-Complexity**

The measure of self-complexity used was the procedure developed by (Linville, 1985, 1987). It is a trait-sort method which reflects both the number and distinctiveness of attributes an individual uses to think about himself or herself.

Subjects were given a packet of 33 randomly ordered index cards, each containing the name of one trait and a
number in the corner. See Appendix A for a list of the traits used. The traits were chosen from a pretest, open-ended self-description task to represent a wide range of dimensions that students use to think about themselves, including both positive and negative traits. Ten blank cards and a recording sheet (with each side containing 11 columns) were also given to subjects. Subjects were told that the task involved using these traits to describe themselves "by sorting the traits descriptive of you into groups according to which traits you think belong together." Traits could be sorted on any meaningful basis, and each pile of traits might represent a different aspect of the self. The same trait could be included in multiple piles; the blank cards were provided for this purpose.

Each subject was subsequently assigned a self-complexity score using a measure of dimensionality based on the H statistic, an index of dispersion (Scott, Osgood, & Peterson, 1979). Self-complexity (SC) is defined by the formula, \( SC = \log_2 n - (\sum n_i \log_2 n_i) / n \), where \( n \) is the total number of features (here 33), and \( n_i \) is the number of features that appear in a particular group combination.

Linville (1987) defines a group combination as follows:

To define a group combination, consider a feature that is sorted in Group 1 and Group 2 but no others. This feature is said to fall into the group
combination 1-2. More generally, if a person forms two groups, a given feature may fall into one of four possible group combinations: 1, 2, 1-2, or no group. The \( n_i \) in the formula would be interpreted as follows in this example: \( n_1 \) = number of features sorted only into Group 1; \( n_2 \) = number of features sorted only into Group 2; \( n_{12} \) = number of features sorted only into both Group 1 and Group 2; and \( n_4 \) = number of features not sorted into any group. If the \( i \)-th group combination has no members (i.e., \( n_i = 0 \)), it is excluded from the summation. (pg. 666)

The greater the number of self-aspects created and the less redundant the features used in creating these self-aspects, the greater the SC score. High self-complexity thus results from having a large number of self-aspects that are nonredundant regarding the features that describe them. Low self-complexity is a function of having few self-aspects or from having many self-aspects that are highly redundant regarding the features that describe them. It is expected that trait categories are related to superordinate traits (e.g., introverted), roles (e.g., student), relationships (e.g., helper), activities (e.g., parties), and evaluatively organized aspects (e.g., best qualities).
Physical Symptoms

As a measure of physical symptomatology, the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS) (Cohen & Hoberman, 1983) was utilized. The CHIPS is a list of 33 common physical symptoms, many of which have been traditionally viewed as psychosomatic. The scale excludes symptoms obviously psychological in nature. Each item is rated for how much that particular problem bothered or distressed the individual during the past 2 weeks. Items are rated on a 5-point scale from "not at all" to "extremely."

In two samples of college students, the CHIPS was found to be significantly correlated (.29 and .22) with use of student health facilities in the 5-week period following completion of the scale. The internal reliability (Cronbach’s alpha) of the CHIPS, as measured in the study sample, is .88.

Health Behavior

A health behavior rating scale (HBRS) was devised to measure positive health behavior. Scale items reflect those behaviors that have been empirically associated with longevity (Gottlieb & Green, 1984; Thoresen & Eagleston, 1985), negatively correlated with major causes of death (Bauer & Wilson, 1981), and measured in other research as indicative of positive health activity (Mechanic & Cleary, 1980; Prohaska, Leventhal, Leventhal, & Keller, 1985).
Subjects assign a value to each of the 15 items according to their perception of the extent to which the item is true for them (0—never, 1—occasionally, 2—frequently, and 3—always). The scale may be found in Appendix B.

**Life Purpose and Meaning**

The Purpose-in-Life (PIL) Test (Crumbaugh & Maholick, 1969) was used to measure the degree to which subjects felt a sense of purpose for their lives. The self-report inventory consists of 20 items rated on a seven-point scale where position 4 is designated as "neutral". Different descriptive terms are given for positions 1 and 7 for each item. The authors have used the PIL to distinguish patient and non-patient mental health populations. Its criterion validity has been assessed using therapists' ratings of their clients' degree of purpose and meaning in life and correlating these ratings with PIL scores (N = 50, r = .38, p < .05). Split-half (odd-even) reliability was determined to be .81 (N = 225). Norms based on 1,151 cases are provided. Subjects scoring high on the PIL have been found to be less neurotic and more sociable (Pearson & Sheffield, 1974), and less anxious (Crumbaugh, Raphael, & Shrader, 1970). In addition, PIL scores have been significantly correlated with measures of psychosocial maturity, ego identity, and social desirability (Sammon, Reznikoff, & Geisinger, 1985). Also, high PIL scores have been found to be related
to involvement in organized groups (Doerries, 1970).

As a rudimentary measure of the number of broad categories from which subjects derive a sense of meaning for their lives, a checklist of meaning in life categories was utilized (MIL). The categories included on the checklist were those used in the research conducted by DeVogler and Ebersole (1980, 1981; Ebersole & DeVogler, 1981; DeVogler-Ebersole and Ebersole, 1985). The nine meaning category items with brief descriptions of the categories are included in Appendix C.

Procedure

Responses of subjects to all the measures in this study were kept anonymous and confidential. Each subject was assigned a three-digit code which was used on each measure. Undergraduate students initially completed the LES and PSS on a take-home basis as part of the screening procedure. This initial testing took place during the second week of the academic quarter. Complete instructions given to subjects may be found in Appendix D. Respondents were given the opportunity to provide their first name, a telephone number, and a convenient time to be called if they were interested in participating further in the study. This additional participation was contingent upon being invited to continue in the study. The form used to collect this information is included in Appendix E. Only those undergraduates who scored at or above the mean on
either (or both) the LES (M = 10.31, SD = 8.06, N = 333) or the PSS (M = 26.29, SD = 8.14, N = 333) were invited to participate in the duration of the study. Students were informed that their attendance at two subsequent sessions was the commitment required for additional participation. The screening procedure yielded 184 individuals who scored at or above the mean on either (or both) the LES or PSS and indicated a willingness to participate further. Arrangements for continued participation were made with 126 of those successfully contacted by telephone.

Students who agreed to continue in the study were scheduled to appear at a mutually convenient time. One of four interventions was randomly assigned to each group of subjects. All groups completed identical measures but differed with respect to the intervention experienced.

The intervention in Group A (RAP) involved listening to a presentation describing the essential hypothesis of the study, that is, that thinking about the self in a variety of independent ways appears to make a person less susceptible to stress-related illness. The presentation was done in the form of a "rap" and subjects were given a script to follow while listening to the music. These subjects were further encouraged to think about themselves in a greater variety of ways during the next few weeks. See Appendix F for a description and script of this presentation.
Subjects in Group B (PP) were not told the hypothesis of the study but rather completed a paper and pencil exercise designed to have them expand the number of ways they thought about themselves, especially with regard to roles. The exercise asked subjects to imagine ways in which they could view themselves having a greater number of roles, without making actual behavioral changes (e.g., thinking about oneself as "a reader" with respect to reading textbooks or newspapers, even though reading may take place in the context of the larger role of student). This exercise was based upon the notion that having subjects imagine themselves in many roles would make it more likely that they would subsequently think of themselves with reference to these roles. The tasks of writing sentences about themselves regarding each role, and choosing an affective adjective to go with that role, were included to increase the self-relevance of the exercise. The paper and pencil exercise is included in Appendix G.

The intervention for Group C (BOTH) included both the "rap" (the presentation of the essential hypothesis of the study) and the paper and pencil exercise.

Group D (CONTROL) functioned as a control group. Subjects in this group experienced no intervention.

Groups A and B together consisted of approximately one-third of the overall number of subjects. Hence, the N
for each of these intervention groups is approximately half the N for Groups C and D. Because the primary research question concerned the effect of the strong intervention compared to no intervention, fewer subjects were assigned to the "weaker" intervention groups. Groups A and B were included to determine which facet of the intervention had the greatest impact.

Subject groups for the first session were homogeneous (with respect to the intervention received) and consisted of 4 to 9 persons. These sessions took place during the 3rd week of the quarter. At this session, subjects were placed in individual cubicles and first completed the self-complexity measure. Subjects not completing this measure within 15 minutes were asked to complete it within another 5 minutes. Subjects then completed the CHIPS, HBRS, MIL, and PIL, respectively. Upon completion of these measures the appropriate intervention took place. Session One instructions may be found in Appendix H.

Prior to leaving Session One, subjects were scheduled to return for Session Two during the 7th week of the quarter. Reminder telephone calls were made one week prior to the second session. While groups for the second session also consisted of 4 to 9 persons, they were heterogenous with respect to membership in Group A, B, C, or D. Session Two measures included the self-complexity measure, LES, PSS, CHIPS, HBRS, MIL, and PIL, in this order. See
Appendix I for Session Two instructions. Upon completion of these measures, subjects were debriefed about the purpose and hypotheses of the study and about the various experimental conditions. The debriefing text is included in Appendix J. Subjects' questions were answered. Subjects wishing to receive a summary of the results of the study were asked to provide an address where the summary could be sent when completed.

Results

Data were analyzed using multivariate analysis of variance (MANOVA), multiple regression, and correlational procedures. Results of these analyses will be reviewed, respectively.

Multivariate Analysis of Variance (MANOVA)

Multivariate analysis of variance (MANOVA) is the statistical procedure recommended for the analysis of data from an experiment which has more than one dependent variable (Haase & Ellis, 1987). There are two clear advantages of MANOVA over doing multiple univariate analyses of variance (ANOVAs). First, MANOVA can control experimentwise error rates (both Type I and Type II) which can become excessive when numerous univariate analyses are done with multiple dependent variables. Second, MANOVA makes use of intercorrelations between variables which cannot be considered in univariate techniques.
The MANOVA design utilized here includes the following measures at Time 1 (prior to intervention) and at Time 2 (4 weeks after the intervention): LES, PSS, SC, CHIPS, HBRS, MIL, and PIL. Table 1 presents overall means and standard deviations for each of these measures at Time 1 and Time 2. Table 2 presents the corresponding data for each of the four intervention groups.

When all variables are considered together, regardless of group membership, there is no main effect for time [Hotelling t-square = 11.07, F(7,100) = 1.49, p < .18]. The individual variables which most approximate significant change from Time 1 to Time 2 are perceived stress (PSS) [F(1, 106) = 2.64, p < .11] and health

Table 1

<table>
<thead>
<tr>
<th>Overall Means and Standard Deviations of Repeated Measures</th>
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<tbody>
<tr>
<td>Time 1</td>
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<tr>
<td>--------</td>
</tr>
<tr>
<td>Mean</td>
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<tr>
<td>OVERALL (N=110)</td>
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<tr>
<td>LES</td>
</tr>
<tr>
<td>PSS</td>
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<td>SC</td>
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<td>CHIPS</td>
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<tr>
<td>HBRS</td>
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<td>MIL</td>
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<tr>
<td>PIL</td>
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</tbody>
</table>

Note. LES = negative life events. PSS = perceived stress. SC = self-complexity. CHIPS = physical symptoms. HBRS = positive health behaviors. MIL = meaning in life. PIL = purpose in life.
Table 2

Means and Standard Deviations of Repeated Measures By Intervention Group

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
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<th>Time 2</th>
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<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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<tr>
<td>GROUP A (RAP)</td>
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<td></td>
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</tr>
<tr>
<td>(N=19)</td>
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<td></td>
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</tr>
<tr>
<td>LES</td>
<td>11.79</td>
<td>5.39</td>
<td>11.58</td>
<td>6.24</td>
</tr>
<tr>
<td>PSS</td>
<td>31.79</td>
<td>6.52</td>
<td>27.53</td>
<td>8.73</td>
</tr>
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<td>SC</td>
<td>3.16</td>
<td>.67</td>
<td>3.17</td>
<td>.60</td>
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<tr>
<td>CHIPS</td>
<td>24.42</td>
<td>11.87</td>
<td>20.95</td>
<td>12.14</td>
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<td>HBRS</td>
<td>24.53</td>
<td>6.55</td>
<td>23.89</td>
<td>6.90</td>
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<tr>
<td>MIL</td>
<td>5.42</td>
<td>1.95</td>
<td>5.37</td>
<td>1.92</td>
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<tr>
<td>PIL</td>
<td>100.37</td>
<td>11.01</td>
<td>101.05</td>
<td>13.41</td>
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<td>GROUP B (PP)</td>
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<td>(N=17)</td>
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<tr>
<td>LES</td>
<td>11.59</td>
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<td>11.18</td>
<td>8.11</td>
</tr>
<tr>
<td>PSS</td>
<td>33.82</td>
<td>4.19</td>
<td>32.53</td>
<td>7.55</td>
</tr>
<tr>
<td>SC</td>
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<td>.62</td>
<td>3.06</td>
<td>.79</td>
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<tr>
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<td>31.06</td>
<td>14.81</td>
<td>28.47</td>
<td>15.72</td>
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<tr>
<td>HBRS</td>
<td>26.18</td>
<td>2.48</td>
<td>25.82</td>
<td>4.45</td>
</tr>
<tr>
<td>MIL</td>
<td>4.94</td>
<td>1.34</td>
<td>5.24</td>
<td>1.35</td>
</tr>
<tr>
<td>PIL</td>
<td>97.82</td>
<td>13.94</td>
<td>96.94</td>
<td>15.01</td>
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<td>GROUP C (BOTH)</td>
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<td>(N=38)</td>
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</tr>
<tr>
<td>LES</td>
<td>13.79</td>
<td>6.10</td>
<td>11.32</td>
<td>7.02</td>
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<td>PSS</td>
<td>30.61</td>
<td>5.86</td>
<td>29.82</td>
<td>10.19</td>
</tr>
<tr>
<td>SC</td>
<td>2.81</td>
<td>.68</td>
<td>2.92</td>
<td>.66</td>
</tr>
<tr>
<td>CHIPS</td>
<td>25.24</td>
<td>11.20</td>
<td>24.55</td>
<td>13.26</td>
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<tr>
<td>HBRS</td>
<td>23.50</td>
<td>5.93</td>
<td>22.74</td>
<td>5.87</td>
</tr>
<tr>
<td>MIL</td>
<td>6.13</td>
<td>1.53</td>
<td>5.68</td>
<td>1.63</td>
</tr>
<tr>
<td>PIL</td>
<td>103.39</td>
<td>13.43</td>
<td>102.11</td>
<td>15.09</td>
</tr>
<tr>
<td>GROUP D (CONTROL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LES</td>
<td>14.19</td>
<td>7.49</td>
<td>13.58</td>
<td>9.16</td>
</tr>
<tr>
<td>PSS</td>
<td>29.33</td>
<td>8.37</td>
<td>30.31</td>
<td>9.07</td>
</tr>
<tr>
<td>SC</td>
<td>3.42</td>
<td>.70</td>
<td>3.29</td>
<td>.63</td>
</tr>
<tr>
<td>CHIPS</td>
<td>27.22</td>
<td>16.01</td>
<td>26.81</td>
<td>19.87</td>
</tr>
<tr>
<td>HBRS</td>
<td>26.28</td>
<td>5.77</td>
<td>25.58</td>
<td>6.00</td>
</tr>
<tr>
<td>MIL</td>
<td>5.25</td>
<td>1.92</td>
<td>5.11</td>
<td>1.58</td>
</tr>
<tr>
<td>PIL</td>
<td>100.19</td>
<td>16.75</td>
<td>101.11</td>
<td>17.86</td>
</tr>
</tbody>
</table>

Note. LES = negative life events. PSS = perceived stress. SC = self-complexity. CHIPS = physical symptoms. HBRS = positive health behaviors. MIL = meaning in life. PIL = purpose in life.
symptoms (CHIPS) \( \text{F}(1, 106) = 2.99, p < .09 \). The absence of an effect for time is consistent across intervention groups \( \text{Hotelling-Lawley trace} = .22, \text{F}(21, 287.70) = 1.05, p < .40 \), that is, there is no overall interaction between time and type of intervention.

Although convention with MANOVA is to not pursue further analyses in the absence of overall effects, identifying trends within the intervention groups is of concern to the present research. There is no overall main effect for time in Group A (RAP) \( \text{Hotelling t-square} = 10.72, \text{F}(7,100) = 1.44, p < .20 \), however the decrease in perceived stress (PSS) from Time 1 to Time 2 is significant \( \text{F}(1, 106) = 5.23, p < .03 \). There is an overall main effect for time in Group C (BOTH) \( \text{Hotelling t-square} = 15.85, \text{F}(7, 100) = 2.14, p < .05 \). This overall effect is due primarily to a decrease in negative life events (LES) \( \text{F}(1, 106) = 4.25, p < .05 \) and a decrease in meaning in life categories (MIL) \( \text{F}(1, 106) = 4.24, p < .05 \).

When Time 1 and Time 2 measures are considered together, there is an overall main effect for group membership \( \text{Hotelling-Lawley trace} = .36, \text{F}(21, 287.70) = 1.66, p < .04 \). This indicates that there is a significant difference on at least one measure related to group membership. This overall main effect is due primarily to a significant difference between groups on self-complexity.
most notably a difference on this measure between Groups C (BOTH) and D (CONTROL).

Multiple Regression

The interventions included in this experiment aimed to increase self-complexity with the ultimate goal of enhancing the stress-buffering effect. This effect, reported by Linville (1987), is represented by a multiple regression model that includes a term for the multiplicative interaction of stress and self-complexity. The basic model is as follows: Health(T2) = Health(T1) + Stress(T1) + Self-Complexity(T1) + [Stress(T1) X Self-Complexity(T1)] + Error. Health at Time 2 is said to be a function of health at Time 1, recent negative life events at Time 1, self-complexity at Time 1, plus the interaction between recent negative life events at Time 1 and self-complexity at Time 1. The key term in the model is the interaction term, and the partial regression coefficient for this term is predicted to be negative.

The standardized partial regression coefficients for this model using the entire data set for this experiment are shown in Table 3. The only term which is a significant contributor to health at Time 2 is health at Time 1. The standardized partial regression coefficient for the interactive term (stress X self-complexity) is negative but is not statistically significant (p < .56). Linville’s (1987) standardized partial regression coefficients for
Table 3

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Standardized Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health (T1) (CHIPS 1)</td>
<td>.75***</td>
</tr>
<tr>
<td>Stress (T1) (LES 1)</td>
<td>.33</td>
</tr>
<tr>
<td>Self-Complexity (T1) (SC 1)</td>
<td>.08</td>
</tr>
<tr>
<td>Stress X Self Complexity (LES 1 X SC 1)</td>
<td>-.21</td>
</tr>
</tbody>
</table>

Note. Outcome variable is health at Time 2 (CHIPS 2).
R-square = .63. N = 110.
*** p < .001.

these variables were .78, .61, .34, and -.68, respectively, and all were statistically significant. R-square for her data was .71.

Using the measure of perceived stress (PSS) in place of negative life events (LES) as the "stress" term yielded similar results. If the main effect terms for stress and self-complexity are removed from the model, the standardized partial regression coefficient for health (Time 1) (CHIPS1) is .76 (p < .001) while that for the stress/self-complexity interaction (LES 1 X SC 1) is .13 (p < .05). R-square in this multiple regression is .62. While the interaction coefficient becomes statistically significant in such a revised model, the sign for that
coefficient is not negative, as predicted by the buffering hypothesis.

Table 4 shows standardized partial regression coefficients for the self-complexity buffering model for each intervention group. The prediction was that the buffering effect would be most enhanced by the strong intervention (Group C), and enhanced to a lesser extent by the milder interventions (Groups A and B). Clearly, the

Table 4

<table>
<thead>
<tr>
<th>Standardized Partial Regression Coefficients for the Self-Complexity Buffering Model By Intervention Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standardized Coefficients</strong></td>
</tr>
<tr>
<td>Independent Variable</td>
</tr>
<tr>
<td>Health (T1) (CHIPS 1)</td>
</tr>
<tr>
<td>Stress (T1) (LES 1)</td>
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<tr>
<td>Self-Complexity (T1) (SC 1)</td>
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<tr>
<td>Stress/Self-Complexity (LES 1 X SC 1)</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>R-square</td>
</tr>
</tbody>
</table>

**Note.** Outcome variable is health at Time 2 (CHIPS 2). Interventions: A = hypothesis presentation (RAP) B = paper/pencil exercise (PP) C = hypothesis & paper/pencil (BOTH) D = no intervention (CONTROL)

***p < .001. *p < .05.
regression for Group C most closely approximates the self-complexity/stress interaction buffering effect, and all independent variables are significant contributors to the model with the exception of the self-complexity main effect ($p < .20$). The interaction term in Group A is directional but non-significant ($p < .20$). While these results suggest that the strong intervention enhanced the buffering effect, the lack of a baseline effect in the absence of any intervention is a result contrary to that of Linville (1987). Statistically, the difference between the regression equations for the four groups is not significant.

Neither health behavior or purpose in life at Time 1 accounts for additional significant variance in health symptoms at Time 2. In order to explain additional variance in Time 2 health symptoms, other Time 2 variables must be introduced into the regression model. Post hoc analyses indicate that 70% of the variance in health symptoms at Time 2 can be explained using Time 1 health symptoms along with Time 2 negative life events, health behaviors, self-complexity, and the health behavior/self-complexity interaction. The standardized regression coefficients for these variables are shown in Table 5. When this regression model is applied to each intervention group, the health behavior/self-complexity interaction is
Table 5

Standardized Partial Regression Coefficients for Significant Predictors of Health Symptoms at Time 2

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Standardized Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health (T1) (CHIPS 1)</td>
<td>.66***</td>
</tr>
<tr>
<td>Stress (T2) (LES 2)</td>
<td>.29***</td>
</tr>
<tr>
<td>Health behaviors (T2) (HBRS 2)</td>
<td>.69**</td>
</tr>
<tr>
<td>Self-complexity (T2) (SC 2)</td>
<td>.52*</td>
</tr>
<tr>
<td>Health behaviors X Self-complexity (HBRS 2 X SC 2)</td>
<td>-.94**</td>
</tr>
</tbody>
</table>

Note. Outcome variable is health at Time 2 (CHIPS 2). R-Square = .70. N = 110.
***p < .001. **p < .01. *p < .05.

significant only with Group C (strong intervention) (t = -2.20, p < .05).

In a similar overall multiple regression analysis where the Time 2 values for self-complexity and positive health behaviors are replaced with Time 1 values, neither of these variables, nor the interaction of the two, account for a significant portion of the variance in health symptoms at Time 2. Therefore it is important to note that the self-complexity/health behavior interaction is significant only when Time 2 variables are used to account for variance in Time 2 health symptoms.
Correlational Analyses

Zero-order correlations for all variables are shown in Table 6. A number of the relationships between these variables warrant attention.

One unexpected statistic is the correlation of only .01 between negative life events and perceived stress at Time 1. This is in sharp contrast to the highly significant correlation between these variables at Time 2 \([r(110) = .48, \, p < .001]\) and in the overall screening group \([r(333) = .44, \, p < .001]\). This discrepancy is noteworthy in that these variables are the stress measures combined with the self-complexity measure to examine the buffering effect. Both measures are highly consistent from Time 1 to Time 2 [LES: \(r = .49, \, p < .001\); PSS: \(r = .51, \, p < .001\)]. Of all eight correlations between health symptoms and these two stress indices, only negative life events at Time 1 (LES 1) and health symptoms at Time 1 (CHIPS 1) are not significantly correlated (\(r = .12, \, p < .21\)). Other researchers report that correlations between life events indices and health measures rarely exceed .30 (Cohen & Hoberman, 1983; Wiebe & McCallum, 1986).

The relationship between positive health behaviors (HBRS) and health symptoms (CHIPS) is not significant at either Time 1 or Time 2 (\(r = -.17\), and \(r = -.16\), respectively; \(p < .10\)). Health behaviors are positively related to purpose in life (PIL) at both measurement times.
Table 6  
Zero-Order Correlations for Experiment 1 Variables

<table>
<thead>
<tr>
<th>VARIABLE</th>
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<tbody>
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<tr>
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<td>.02</td>
<td>.51</td>
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<td>.45</td>
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<td>-.11</td>
<td>-.23</td>
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<td>15. NIL 2</td>
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<td>-.29</td>
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<td>.00</td>
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<td>.05</td>
<td>-.09</td>
<td>.08</td>
<td>---</td>
<td></td>
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<tr>
<td>16. PIL 2</td>
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<td>.06</td>
<td>-.42</td>
<td>.13</td>
<td>-.18</td>
<td>.22</td>
<td>.33</td>
<td>.80</td>
<td>-.21</td>
<td>-.47</td>
<td>.09</td>
<td>-.09</td>
<td>.26</td>
<td>.36</td>
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</tbody>
</table>

Note. N = 110. LES = negative life events. PSS = perceived stress. SC = self-complexity. CHIPS = physical symptoms. HBRs = positive health behaviors. NIL = meaning in life categories. PIL = purpose in life. 1 = Time One. 2 = Time Two. *p < .01. **p < .01. ***p < .01.
and positively related to self-complexity at Time 1. Positive health behaviors are inversely related to negative life events at both measurement points.

Females reported a greater number of health symptoms at both Time 1 and Time 2 ($r = .25$, $p < .01$ and $r = .19$, $p < .05$, respectively). With correlations of similar strength, age was negatively related to health symptoms.

Correlations of $-.43$ and $-.47$ ($p < .001$) were obtained between purpose in life and perceived stress at Time 1 and Time 2, respectively. Self-complexity was not significantly related to either of these variables. Repeated measure coefficients for the seven variables ranged from $.49$ ($p < .001$) (negative life events) to $.80$ ($p < .001$) (purpose in life).

DeVogler-Ebersole and Ebersole (1985) asked subjects to write about sources of meaning for their lives. Subsequently these essays were classified according to general meaning categories. The present experiment simply asked subjects to indicate which of eight supplied meaning categories were a source of meaning. DeVogler-Ebersole and Ebersole (1985) reported the mean number of categories per subject to be 4.26. The present research obtained a mean of 5.54 ($SD = 1.75$) meaning categories at Time 1. The percentage of subjects endorsing each meaning category as a source of meaning for her/his life are shown in Table 7. Consistent with DeVogler-Ebersole and Ebersole (1985), the
Table 7

Percentages of Subjects Endorsing Specific Meaning in Life Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationships</td>
<td>95.5%</td>
</tr>
<tr>
<td>Growth</td>
<td>90.0%</td>
</tr>
<tr>
<td>Pleasure</td>
<td>74.5%</td>
</tr>
<tr>
<td>Health</td>
<td>64.5%</td>
</tr>
<tr>
<td>Life Work</td>
<td>60.0%</td>
</tr>
<tr>
<td>Obtaining</td>
<td>60.0%</td>
</tr>
<tr>
<td>Belief</td>
<td>57.3%</td>
</tr>
<tr>
<td>Service</td>
<td>43.6%</td>
</tr>
</tbody>
</table>

Note. N = 110. Subjects endorsed as many categories as were relevant. See Appendix C for category descriptions.

categories of "relationships" and "growth" were among the most frequently endorsed. Contrary to this previous research, the categories of "belief" and "service" were the least frequently endorsed in this study.

A correlational analysis was undertaken to determine if endorsement of any of the specific meaning categories at Time 1 was significantly associated with any of the Time 2 variables. A few significant relationships were found. Indicating that "relationships" are a source of meaning was inversely related to perceived stress ($r = -0.20$, $p < .05$). Identifying the "belief" category as a source of meaning was positively correlated with the number of physical symptoms reported ($r = 0.36$, $p < .0001$). Purpose in life (PIL) scores were positively related to endorsement of the following categories: relationships ($r = 0.39$, $p < .0001$), growth ($r = 0.24$, $p < .05$), health ($r =
.21, \( p < .05 \), service (\( r = .20, p < .05 \)), and pleasure (\( r = .19, p < .05 \)). It should be noted that identifying "health" as a meaning category was not significantly related to positive health behaviors or physical symptoms.

Discussion

Evaluation of Hypotheses

Hypotheses 1 and 1a predicted that self-complexity would increase as a result of the cognitive interventions, and that the increase would be proportional to the strength of the intervention received. The data reported here do not corroborate these hypotheses as no significant change in self-complexity was obtained for any of the intervention groups. Figure 2 depicts the slight changes in self-complexity in each group. (These results may be compared to those hypothesized in Figure 1, page 69.) The greatest increase occurs in Group C (strong intervention) as predicted, but the change is not statistically significant. The differences between the groups is greater than any change from Time 1 to Time 2 within a group. Statistical regression to the mean must be considered as one possible explanation for these results, especially since the amount of decrease toward the overall mean in the control group (Group D) is similar to the change observed in Group C.

The predictions of Hypotheses 2 and 2a were that the
occurrence of stress-related health symptoms would decrease as a result of the intervention, and that the decreases would be proportional to the strength of the intervention. Although there was an overall non-significant decrease in health symptoms, these data do not support these hypotheses.

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Note. Group A = hypothesis presentation only (RAP). Group B = paper/pencil exercise only (PP). Group C = both hypothesis presentation and paper/pencil exercise (BOTH). Group D = no intervention (CONTROL).

Figure 2

Change in Self-Complexity as a Function of Type of Psychoeducational Intervention
The correlations between self-complexity and the existential variables (purpose in life and meaning in life categories) were positive but did not approach acceptable levels of statistical significance. Hence, Hypothesis 3, that a positive correlation exists between self-complexity and these existential variables, and Hypothesis 3a, that increases in self-complexity would be mirrored by increases in these existential variables, must be rejected.

Hypothesis 4 predicted that occurrences of stress-related health symptoms would be inversely related to measures of purpose and meaning in life. The obtained correlations between these variables were negative, but they also did not reach acceptable levels of statistical significance. These data, then, do not corroborate Hypothesis 4.

A positive correlation between self-complexity and positive health behaviors was predicted by Hypothesis 5. A positive relationship between these variables was found, but the relationship was statistically significant only at Time 1. This corroboration of Hypothesis 5 must be regarded as tentative. Hypothesis 5a, that increases in positive health behaviors would correspond to increases in self-complexity, is not supported. Positive health behaviors did not increase from Time 1 to Time 2.
Although the direction of some of the results was consistent with these hypotheses, overall, the interventions had little direct effect on these variables. One obvious conclusion is that the interventions were not strong enough to achieve the desired effect. A clearer perspective on such a conclusion can be gained by comparing these data with those from previous research and by considering the information gained through the post hoc analyses.

Comparison to Previous Research

Inasmuch as the interventions in this experiment did not have a significant effect on self-complexity, these overall data may be directly compared to the results reported by Linville (1987). As mentioned earlier, the multiple regression results obtained with the entire sample using Linville's self-complexity model are not significant. Identical measures were used in the present study, with the exception of the life events instrument. Subjects in the present study rated life events experienced during the previous six months, while participants in Linville's research completed an instrument directly targeted for college students in which events experienced during the previous two weeks were rated. Also, Linville's repeated measures occurred at a two-week interval, while in the present study the interval was four weeks. Either or both of these variations could
be the reason for the non-significant results obtained here, although the robustness of the self-complexity buffering effect is suspect if it is dependent on exact replication.

However, the fact that the buffering self-complexity/stress interaction was replicated in the Group C (strong) intervention group suggests that the intervention enhanced an effect that was unexpressed in the overall sample of undergraduates. This result suggests that psychoeducational intervention may not result in a main effect on self-complexity but may impact the self-complexity/stress interaction to enhance its buffering effect.

While the Time 1 difference between groups in self-complexity was statistically significant, the range was comparable to that reported with the self-complexity measure in previous research. Linville (1985) reports means of 2.86 and 3.56 on this measure with undergraduate samples. The overall mean in the present sample (3.11 at Time 1) is nearly identical to that reported by Linville (1987) (3.09 at Time 1) in her study examining the self-complexity buffering effect on stress-related illness. Marked differences are evident, however, on Time 1 scores of health symptoms (CHIPS) and perceived stress (PSS) when the present data are compared with those of Linville. Greater perceived stress (30.89 vs. 22.75) and higher
physical symptom scores (26.65 vs. 18.45) were obtained in the present sample.

General Findings

One intriguing result is the significant self-complexity/health behavior interaction at Time 2, found in the post hoc analyses. This interaction is not significant when Time 1 variables are used to account for Time 1 physical symptoms. An argument was made in Chapter 2 regarding the plausibility of a positive correlation between these variables. The interaction found at Time 2 invites speculation that the health benefits of positive health behaviors and self-complexity are multiplicative, not additive. More will be said about this in Chapter 5.

The non-significance of the inverse relationship between positive health behaviors and health symptoms is troublesome, but not inconsistent with previous research looking at the relationship between such variables. It may be that current measures are of insufficient sensitivity to reflect a more direct relationship between these variables. Another explanation might be that persons who practice more positive health behaviors are more somatically self-aware and hence also more likely to notice and report the types of symptoms included on questionnaires of physical health. A third possibility is that positive health behaviors have a more global benefit which goes undetected by indices of health symptoms (i.e.,
persons are less likely to develop chronic illnesses but still manifest acute stress-related symptoms). A fourth, but less appealing possibility is that the measures are accurate and that health behaviors have less effect on health than commonly assumed.

A sense of purpose in life was not directly related to health symptoms, but was positively correlated with positive health behaviors and inversely related to perceived stress. Approximately 20% of the variance is shared between perceived stress and a sense of purpose in life, as measured here. The purpose in life measure (PIL) was more reliable from Time 1 to Time 2, but suggestion about a causal direction in the relationship between these variables is purely speculative. One hypothesis would be that individuals with a greater sense of purpose in life are less sensitive to transient stressors in daily living. The purpose in life (PIL) mean for this sample (100) is just under the mean in the normative sample for the PIL (102) and falls in the range described as "indecisive with regard to a sense of purpose in life" (Crumbaugh & Maholick, 1969). Subjects in this present study were at or above the mean (of the undergraduate screening group) on at least one of two indices of stress, so lower than average PIL scores would be expected.

The number of meaning in life categories endorsed by subjects in this study was positively related to purpose
in life (PIL) scores. However, the notion that self-complexity would be associated with the number of meaning in life categories was not supported. The usefulness of such a checklist in this research arena is not evident from these results.

Two statistical results that elude clear explanation deserve mention. The first is the significant decrease in reported negative life events and meaning in life categories in the Group C (strong) intervention group. This result, however, was not sufficiently strong to make the overall MANOVA significant, and the raw data do not appear divergent enough to have practical significance. The more troublesome statistical anomaly is the absence of a correlation between Time 1 measures of perceived stress and negative life events in the sample as a whole. This sample comprised approximately one third of the screening group in which these variables had a correlation of .44. Correlational analyses by intervention group indicate that this deviation was clearly represented in all groups, except Group B. While there is no evidence that this irregularity had a deleterious effect on other analyses, it is a characteristic on which this sample is not representative of the population.

There were no significant sex differences in the regression analyses of buffering effects involving self-complexity. When the sample was divided into high stress
and low stress subjects (based upon the means of the stress indices), no significant differences in the regression analyses were obtained.

Overall, the best predictors of physical symptoms at Time 2 were physical symptoms at Time 1 and negative life events reported at Time 2. The predictive value of these variables was consistent across a variety of post hoc regression analyses.
CHAPTER IV
EXPERIMENT TWO

Experiment 2 was conducted as a supplementary study to Experiment 1, with the purpose of collecting data from a population of persons who were believed to be under greater stress than undergraduate students and who sought ways to better manage the stress in their lives.

Method

Subjects

Twenty-five first and second year veterinary students participated in Experiment 2. There were 20 females and 5 males with a mean age of 25.8 (SD = 4.4). An additional 16 females and 2 males attended session one of the experiment but did not return for session two.

Measures

Subjects completed measures of life experiences (LES), perceived stress (PSS), physical symptoms (CHIPS), and positive health behaviors (HBRS) both at Time 1 and Time 2. Descriptions of these measures may be found in Chapter 3 on pages 75 through 81.
Procedure

Participants for the study were solicited via a memo placed in mailboxes of 260 first and second year veterinary students. The memo described a two-part stress management seminar which also would involve gathering stress-related data from participants. The seminar meetings were scheduled over the noon hour due to the full schedules of these students. A copy of the solicitation memo is included in Appendix K.

Students were given a choice of two dates for Session One and two other dates for Session Two. These choices were given to divide participants into two groups through the scheduling process. Randomly, one group was made the experimental group and the other served as a control group.

At Session One (held during the second week of the quarter), both groups first completed the Time 1 measures. Participants used the last 4 digits of their Social Security numbers to identify their materials while protecting their anonymity and confidentiality. A presentation of "physical" stress management procedures followed which included information about mind-body relationships, the physiological impact of stress, lifestyle factors, relaxation procedures, and progressive muscle relaxation. With the experimental group, a description of the buffering role of self-complexity
followed, utilizing the metaphor of a chair with many legs as being more sturdy. Findings from previous research with self-complexity were discussed. Participants in this group were then encouraged to expand self-representation of themselves as "vet students" into smaller categories such as researcher, colleague of other students, test-taker, reader, clinician, and so on. They were further encouraged to identify other aspects of their lives that could function as categories of self-representation. Description and discussion of self-complexity was excluded from the presentation to the control group.

Attendance at the alternative times for Session Two was heterogenous with respect to membership in the experimental or control group. At Session Two (held during the sixth week of the quarter just after mid-terms), participants again first completed the four measures. Following this was a presentation of "cognitive" stress management strategies, including information about cognitions as mediators of emotional response to experience, methods for refuting irrational thinking, and thought-stopping techniques. Discussion of self-complexity was included with both Session Two groups to ensure that all participants received this information. The research hypotheses were fully described and questions were answered.
Results

Overall means and standard deviations for all measures are shown in Table 8, as well as Time 1 results for non-returning participants. Regarding Time 1 measures, the only significant difference between those who returned and those who did not return was on negative life events (LES) \( F(1, 41) = 4.95, p < .05 \).

In comparison to the undergraduate sample in Experiment 1, these veterinary students (who participated in the entire study) experienced fewer negative life events (although the measure is similar if non-returning

Table 8

Descriptive Statistics of Experiment 2 Measures

<table>
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<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
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</tr>
<tr>
<td>Overall (N = 25)</td>
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</tr>
<tr>
<td>LES</td>
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<td>PSS</td>
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<td>23.16</td>
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<td>HBRS</td>
<td>29.44</td>
<td>5.45</td>
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<tr>
<td>Non-returning</td>
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</tr>
<tr>
<td>Participants (N = 18)</td>
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<tr>
<td>LES</td>
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<td>PSS</td>
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<td>HBRS</td>
<td>29.39</td>
<td>5.21</td>
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</tbody>
</table>

Note. LES = negative life events. PSS = perceived stress. CHIPS = physical symptoms. HBRS = positive health behaviors.
participants are included in these averages), indicated less perceived stress, had fewer health symptoms, and reported more positive health behaviors. In general, the veterinary students who participated in Experiment 2 were healthier overall than the undergraduates who participated in Experiment 1, even though the veterinary school environment would generally be considered more stressful.

These data were analyzed using multivariate analysis of variance (MANOVA), multiple regression, and correlational procedures. Because the sample size in this experiment was very small (N = 25), the following results must be regarded as tentative and evaluated carefully.

The multivariate analysis of variance (MANOVA) indicated that none of the variables changed significantly from Time 1 to Time 2, nor were there significant differences between the intervention groups on any of the variables. Nonsignificant trends can be observed from the descriptive statistics presented in Table 9. Regarding health symptoms, the decrease in the experimental group compared to the slight increase in the control group was the predicted result. However, the increase in perceived stress in the experimental group is opposite the predicted result, since no increase is observed in the control group.

In a multiple regression analysis of the variance in health symptoms at Time 2 accounted for by health
Table 9

Means and Standard Deviations of Repeated Measures By Intervention Group in Experiment Two

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>CONTROL (N = 13)</td>
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<td></td>
</tr>
<tr>
<td>LES</td>
<td>10.08</td>
<td>5.75</td>
<td>9.85</td>
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<td>PSS</td>
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<tr>
<td>HBRS</td>
<td>29.69</td>
<td>4.97</td>
<td>30.15</td>
<td>6.23</td>
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EXPERIMENTAL (N = 12)

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<th>Time 2</th>
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<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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<tr>
<td>LES</td>
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<td>6.13</td>
<td>28.42</td>
<td>5.33</td>
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</tr>
</tbody>
</table>

Note. LES = negative life events. PSS = perceived stress. CHIPS = physical symptoms. HBRS = positive health behaviors.

symptoms at Time 1 and the type of intervention experienced (self-complexity information included vs. no such information), health symptoms at Time 1 accounted for a highly significant amount of the variance. While the partial regression coefficient for the self-complexity intervention did not reach statistical significance, its sign was negative, indicating that the intervention was associated with a reduction in health symptoms at Time 2. The standardized partial regression coefficient for physical symptoms at Time 1 was .70 (p < .0001), while that for the self-complexity intervention was -.24 (p <
.09). R-square for this regression model was .60.

Since self-complexity was not measured in this sample, a way to approximate an evaluation of the stress/self-complexity buffering effect is to use the intervention term in place of the self-complexity term in the regression analyses, since the intervention received by half of the subjects aimed to increase self-complexity. When negative life events at Time 1 is used as the "stress" measure, none of the coefficients for stress, intervention, or stress by intervention are significant. However, if perceived stress at Time 1 is used as the "stress" measure, all of these terms explain a significant amount of the variance in health symptoms at Time 2. The standardized partial regression coefficients for this analysis are shown in Table 10. Note that the sign for the interaction term is negative, as predicted by the buffering hypothesis.

Table 11 presents zero-order correlations for all variables. No significant differences were found on any of the variables by sex or age. Correlations for repeated measures ranged from .60 to .89 with the exception of the relationship between perceived stress at Time 1 and Time 2 (r = .38, p < .06). First year students reported more negative life events at both measurement times, and greater perceived stress at Time 2.
### Table 10

**Standardized Partial Regression Coefficients for an Approximation of the Stress/Self-Complexity Buffering Model: Experiment Two**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Standardized Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health (T1) (CHIPS 1)</td>
<td>.69***</td>
</tr>
<tr>
<td>Stress (T1) (PSS 1)</td>
<td>.36*</td>
</tr>
<tr>
<td>Intervention (Self-complexity/Control)</td>
<td>.98*</td>
</tr>
<tr>
<td>Stress X Intervention (PSS 1 X Intervention)</td>
<td>-1.21**</td>
</tr>
</tbody>
</table>

**Note.** Outcome variable is health at Time 2 (CHIPS 2).
R-square = .74. N = 25.
***p < .001. **p < .01. *p < .05.
Table 11

Zero-Order Correlations for Experiment 2 Variables

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SEX</td>
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<tr>
<td>2. AGE</td>
<td>.31</td>
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<tr>
<td>3. CLASS</td>
<td>.20</td>
<td>-.07</td>
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<tr>
<td>4. LES 1</td>
<td>-.08</td>
<td>.34</td>
<td>-.45</td>
<td>---</td>
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<td></td>
<td></td>
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<tr>
<td>5. PSS 1</td>
<td>.14</td>
<td>.00</td>
<td>-.24</td>
<td>.53</td>
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<td></td>
</tr>
<tr>
<td>6. CHIPS 1</td>
<td>.34</td>
<td>-.08</td>
<td>-.10</td>
<td>.29</td>
<td>.47</td>
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<tr>
<td>7. HRS 1</td>
<td>.12</td>
<td>-.39</td>
<td>.16</td>
<td>-.53</td>
<td>-.33</td>
<td>-.48</td>
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<tr>
<td>8. LES 2</td>
<td>.05</td>
<td>-.05</td>
<td>-.40</td>
<td>.60</td>
<td>.39</td>
<td>.30</td>
<td>-.24</td>
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<tr>
<td>9. PSS 2</td>
<td>-.16</td>
<td>.02</td>
<td>-.53</td>
<td>.46</td>
<td>.38</td>
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<tr>
<td>10. CHIPS 2</td>
<td>.35</td>
<td>-.23</td>
<td>-.19</td>
<td>.19</td>
<td>.48</td>
<td>.74</td>
<td>-.15</td>
<td>.36</td>
<td>.47</td>
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<td></td>
</tr>
<tr>
<td>11. HRS 2</td>
<td>.12</td>
<td>-.27</td>
<td>.06</td>
<td>-.36</td>
<td>-.13</td>
<td>-.48</td>
<td>.89</td>
<td>-.11</td>
<td>-.22</td>
<td>-.14</td>
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</tr>
</tbody>
</table>

Note. N = 25. Class = 1st year or 2nd year veterinary student. LES = negative life events. PSS = perceived stress. CHIPS = physical symptoms. HRS = positive health behaviors. 1 = Time One. 2 = Time Two.

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

Because self-complexity and purpose and meaning in life were not directly measured in this experiment, the results reported here can be used only in the evaluation of Hypothesis 2 (of those proposed in Chapter 2), which is that a reduction of the occurrence of stress-related health symptoms will accompany an increase in self-complexity. In the absence of a self-complexity measure, examination of the effect of the intervention designed to increase self-complexity on health symptoms is relevant. While there was no direct reduction of health symptoms as a function of the self-complexity intervention, the intervention had a directional (non-significant) effect when health symptoms at Time 1 are considered as well. This result might be regarded as weak support for Hypothesis 2, but caution is advised as no measure of self-complexity was obtained.

The significance of the stress by intervention interaction term in a multiple regression analysis with health symptoms at Time 2 as the dependent variable is suggestive that the self-complexity buffering effect was enhanced by the intervention that included a discussion of self-complexity. This could be regarded as some tentative evidence that psychoeducational intervention can enhance the self-complexity buffering effect with persons under stress.
The sampling procedure and sample size in Experiment 2 prevent generalizing these data to the entire veterinary student population. Regarding those who participated, the data suggest that their health was better overall than the health of the undergraduates who participated in Experiment 1. What makes this even more striking is that the Experiment 2 participants were students who presented themselves for a stress management seminar. This may indicate that these veterinary students have learned adaptive ways to cope with stress in their lives, otherwise they may not have been successful enough to be admitted to veterinary school in the first place. Attending a stress management seminar might be construed as evidence of a recognition that stress is something to be managed, which in and of itself is an adaptive perspective.
CHAPTER V
GENERAL DISCUSSION

Common Findings

When Experiments 1 and 2 are considered together, a few common results can be identified. First of all, in neither experiment did the interventions designed to increase self-complexity result in significant main effects on any of the repeated measure variables. On the other hand, the most evidence of the self-complexity/stress buffering effect was found with the strong intervention groups. One interpretation of these results is that the effect of the interventions was that of priming or enhancing the buffering effect. If this is the case, this result is more important than would be a demonstration of simple main effects on any of the specific variables.

Caution must be taken with such an interpretation, however, in light of the fact that the presence of the buffering effect was not robust. The self-complexity/stress interaction was significant with only one of the two stress measures in each sample, and the significant measure wasn’t the same in both samples.
In the discussion to follow, limitations of the present research will be mentioned and the self-complexity construct will be evaluated with respect to these studies. Suggestions for future research will be offered.

Limitations of the Research

Subjects in both experiments (undergraduates and veterinary students) were available for limited periods of time. Hence, the self-complexity interventions used in this research were designed to be intense but brief. Therefore, a key question that this research does not answer is whether longer-term interventions would result in significant main effects, especially with respect to self-complexity and physical symptoms.

The supplementary nature of Experiment 2 resulted in interesting additional data, but data which are based on a very small sample size. The only inducement offered to veterinary students to participate was the benefit of attending a stress management seminar. Limited time with these subjects meant that self-complexity was not measured; hence, analyses of the buffering effect of the stress/self-complexity interaction are approximations.

Self-Complexity and Health

Because this project used previous research with the self-complexity buffering hypothesis (Linville, 1987) as a point of departure, the failure to replicate a baseline
buffering effect in the Experiment 1 sample is troublesome. As mentioned in Chapter 3, a different life events measure was used here, and four weeks instead of two was the interval between measurement points. Of course, the inclusion of the interventions was a notable departure from the previous research, but the absence of clear effects of the interventions along with the inclusion of a control group which did not receive an intervention make the data from this sample a comparable replication of Linville (1987). The fact that the stress measures utilized here yielded inconsistent results, along with the fact that Linville reports some varying usefulness with different stress measures and measurement time intervals, suggests that how stress is measured is a critical factor in whether or not evidence for the buffering interaction is obtained.

The effort to understand the impact of a construct like self-complexity on health exemplifies what Schwartz (1982) labels the biopsychosocial approach to behavioral medicine. Implicit in this approach is that multiple variables interact and that health and illness can only be understood by considering such interactions at various levels of analyses. Investigation of the efficacy of interventions or treatments compounds the complexity of understanding such multivariate interactions. This is to say that in the arena of behavioral health, inconsistent
results are prevalent, and robust and replicable results are often rare.

The results of the present research introduce an additional complicating factor to the understanding of how self-complexity and health may be related. This is the presence of an apparent buffering interaction of self-complexity and positive health behaviors at Time 2. This result is intriguing, in that the zero-order correlations between health behaviors and health symptoms were not significant, yet the general consensus of the behavioral health movement is that behavioral changes are the locus of advances in health.

There is a need for a clearer understanding of the mechanisms by which self-complexity can be adaptive for health. While Linville's (1985; 1987) buffering hypotheses are logical and appealing, other alternatives must be ruled out. For example, it may be that persons who score high on self-complexity measures are those who have a greater variety of coping mechanisms for dealing with stress. Or, the relationship between self-complexity and multiple roles may mean that greater social support (associated with multiple roles) rather than cognitive representation of the self is the underlying reason for the apparent self-complexity buffering effect.

If subsequent research can rule out such alternative explanations and provide further evidence for the presence
of the self-complexity buffering effect, the practical significance of this knowledge and the usefulness of interventions designed to enhance the effect must be evaluated. In the multiple regression analyses where the effect was found in the present research, the self-complexity/stress interaction accounted for a very small percentage (1-3%) of additional variance in health symptoms at Time 2 beyond that accounted for by health symptoms at Time 1. Linville (1987) did not report such data. In behavioral health, the practical significance must be evaluated along with statistical significance.

Self-Complexity and Life Meaning

The results of this research did not corroborate the theoretical argument made in Chapter 2 for a relationship between self-complexity and existential factors such as life meaning (as measured by the PIL and meaning in life category checklist). However, the inverse relationship between purpose in life (PIL) and perceived stress (PSS) scores suggests that existential variables are of legitimate concern in the arena of behavioral health. The affective implications of cognitive self-representations serve as a solid foundation for speculation that a relationship exists between self-complexity and a sense of life purpose and meaning. Perhaps research which examines the presence of relationships between self-complexity and existential constructs such as hardiness (Kobasa, 1979;
1982) and sense of coherence (Antonovsky, 1984) is a logical next step.

Self-Complexity and Psychoeducational Intervention

These results suggest that self-complexity is relatively stable and not susceptible to change in response to a one-time, brief intervention. If a psychoeducational intervention is able to increase self-complexity, it likely would need to be a longer-term process.

However, the data presented here lead to the hypothesis that a short-term intervention may function to stimulate or enhance the buffering capabilities of self-complexity (given pre-intervention levels). For an individual experiencing maladaptive stress which is related to a specific role or self-aspect, calling attention to other aspects of the self as sources of self-worth, identity, or coping strategies, may be a ways in which the buffering capability of self-complexity can be stimulated. Longer-term interventions which successfully lead to increases in self-complexity would potentially enhance the capability of self-complexity to function as a buffer to adverse consequences of stress.

While the cost-effectiveness of psychoeducational intervention wasn’t evaluated in this research, information about self-complexity was easily incorporated
into a stress management seminar for veterinary students in Experiment 2. The construct is relatively easy to grasp (especially when presented with an illustration such as the "chair metaphor"), makes intuitive sense, and can be presented to groups. No major expenses are necessarily incurred above the normal cost of educational programs which aim to enhance health. Including a self-complexity component to the psychoeducational aspects of medical rehabilitation programs might prove beneficial.

Directions for Future Research

While the results of this research were not convincing with regard to increasing self-complexity or replicating the buffering effect of the self-complexity/stress interaction, abandoning this program of research is not advocated. Rather, pursuit of a number of lines of investigation is needed.

More basic research with the self-complexity construct could help unravel some of the measuring idiosyncrasies that are apparent, especially with the measurement of stress. If significant results are only obtained with specific measures, perhaps the construct won't live up to its promise. Self-report measures of stress other than those utilized to date might be examined. As this research progresses, physiological indices of stress should be considered, ranging from autonomic responses to neuroendocrine indicators.
The development of alternative measures of self-complexity would be useful.

As progress is made in psychoneuroimmunology, further understanding of physiological correlates of cognitive processes may be pursued. Stone and McCarthy (1983) have reported a stress inoculation effect in animal studies. The adaptation of animals to a wide variety of stressors resulted in reduced catecholamine response in the plasma, brainstem, and heart to subsequent exposure to the same stress. Might the low-level stress associated with higher self-complexity (or multiple roles) have such an inoculation effect? Continuing advances in brain-imaging techniques may lead to the ability to identify cerebral loci of self-representational processes and the neurochemical activity associated with thinking about the self. While such research is highly speculative, it points to the need for expanding interdisciplinary efforts.

Since behavioral changes are touted to be the means by which significant improvement in health and wellness can be realized (Brandt, 1982; Kirsch, 1983), the appearance of a buffering interaction between self-complexity and positive health behaviors should be pursued. If this result is replicable, theoretical explanation of the relationship is needed.

With regard to existential factors and self-complexity, a beginning theoretical foundation for
posing a relationship has been laid in Chapter 2. Since the existential measures used here did not result in significant relationships with self-complexity, other existential measures might be utilized in future research. Any relationship between the variables is likely to be understood only as interactions are identified.

Research with psychoeducational interventions aimed at enhancing self-complexity could profitably be undertaken in field settings. For example, self-complexity could be incorporated into employee wellness programs and subsequent health measures could be taken at various measurement points. Using claims on health insurance as an outcome variable would be one way to do cost-effectiveness evaluation.

The trait-sort measure of self-complexity devised by Linville (1985) has been found to have a test-retest reliability of .70 at a two-week interval (Linville, 1987). In the present research, a similar test-retest coefficient (.71) was obtained with a four-week interval, in spite of the interventions. If an alternative measure of self-complexity could be devised (of comparable or better reliability) that were less cumbersome to administer and could be used with large groups, inclusion of the self-complexity construct in other research endeavors would be more feasible. Such an alternative might enhance progress in self-complexity research.
Conclusion

The literature on the beneficial nature of multiple role involvements (e.g., Spreitzer, Snyder, & Larson, 1979; Thoits, 1983) and the evidence that no single health behavior or coping strategy accounts for much of the variance in health or illness (e.g., Gottlieb & Green, 1984) are both consistent with the folk wisdom that a "well-rounded" life is associated with health. The self-complexity construct corresponds to this perspective.

Research with how cognitive self-representations may be associated with health is still in its infancy. The lack of clear results in the present research points to the complexity of the relationships among such variables. Various hypotheses of how cognitions about the self affect health have been offered, including those tested here.

From the results of the research described here, a conclusion that psychoeducational interventions aimed at increasing self-complexity do reduce susceptibility to stress-related illness is not warranted. Nor is there conclusive evidence that such interventions have no place in applied behavioral health. In some respects, the data obtained here serve to rearrange or re-shuffle some of the fragmented pieces of a small portion of the multidimensional puzzle of health more than they help identify the correct location of any given piece. Progress
behavioral health research from a biopsychosocial perspective can seem elusive.

In the meantime, counseling psychologists and other professionals who endeavor to improve the quality of life of those served must continue to provide services based upon the best available knowledge base. The hypothesis that psychoeducational efforts aimed to increase self-complexity will have beneficial results for persons under stress grows from a rather recent research effort but has theoretical roots in some well-established literature. Inasmuch as there is no reason to believe that such psychoeducational interventions are in any way harmful, development and use of new such approaches with persons who must cope with high levels of stress are encouraged. The collection of data regarding the utility of such efforts will advance progress toward the goal of this project, that being to identify a new way to improve health and enhance the quality of life.
LIST OF REFERENCES


Herschberger, P. J. (1986). Multiple role involvements and the adjustment to conjugal bereavement. Unpublished master’s thesis, The Ohio State University, Columbus, OH.


The second public health revolution: Promise or threat?

Osipow, S. H. (1977). Will the real counseling
psychologist please stand up? *Counseling Psychologist*,
7(2), 93-94.

Health behavior change mediating the stress-illness
relationship. Paper presented at the annual meeting of
the American Psychological Association, Anaheim, CA.

coping. *Journal of Health and Social Behavior*, 19,
2-21.

and Eysenck Personality Inventory. *Journal of Clinical
Psychology*, 30, 562-564.

likelihood model of persuasion. In L. Berkowitz (Ed.),
*Advances in experimental social psychology* (Vol. 19).


Prohaska, T. R., Leventhal, E. A., Leventhal, H., &
cognition in young, middle aged, and elderly adults.
*Journal of Gerontology*, 40, 569-578.

Rogers, M. P., Dubey, D., & Reich, P. (1979). The
influences of the psyche and the brain on immunity and
disease susceptibility. *Psychosomatic Medicine*, 41,
147-164.

Interface of social and clinical psychology. *Journal of
Social and Clinical Psychology*, 1, 120-127.

Rogers, T. B. (1981). A model of the self as an aspect of
the human information processing system. In N. Cantor &
J. F. Kihlstrom (Eds.), *Personality, cognition, and
social interaction* (pp. 193-214). Hillsdale, NJ:
Erlbaum.


APPENDIX A

TRAITS INCLUDED IN SELF-COMPLEXITY SORT

outgoing rebellious
lazy industrious
quiet relaxed
playful reflective
imaginative individualistic
humorous unconventional
soft-hearted affectionate
assertive mature
competitive impulsive
unorganized not studious
emotional sophisticated
studious organized
reserved irresponsible
insecure conformist
cnfident tense
withdrawn unsophisticated
hesitant
APPENDIX B

HEALTH BEHAVIOR CHECKLIST

Beside each of the 15 statements listed below, write the number from the following scale which best describes the extent to which that statement is true for you.

0 - Never 2 - Frequently
1 - Occasionally 3 - Always

_____ 1. I eat breakfast every day.
_____ 2. I get 7-8 hours of sleep each night.
_____ 3. I devote at least 15 minutes of my waking time each day to intentional relaxation or meditation.
_____ 4. I avoid contact with substances that have been identified as carcinogenic (cancer-causing).
_____ 5. I eat a balanced diet, avoiding foods with additives, avoiding high-cholesterol foods, and including bran or other high-fiber foods.
_____ 6. I weigh within 10 pounds of my target weight.
   Target weight:
   **Males:** 100 pounds plus 6 pounds for each inch over 5 feet.
   **Females:** 100 pounds plus 5 pounds for each inch over 5 feet.
_____ 7. I do not smoke cigarettes or use other tobacco products.
_____ 8. I exercise at least three times per week.
_____ 9. I follow advice given by my physician and/or take prescription medication as prescribed.
_____ 10. I tend to avoid behaviors that obviously involve the risk of injury or illness.
_____ 11. I wear seat belts when I drive or am a passenger in a motor vehicle.
12. I do not use illegal drugs.
13. I have regular medical check-ups.
15. I average less than one drink of an alcoholic beverage each day.
APPENDIX C

MEANING CATEGORY CHECKLIST

Think about what currently gives your life meaning. The following categories are descriptive of a few sources of life meaning. Review the categories. Place an "X" beside the item(s) which describe the source(s) of meaning for your life now. Place an "X" in all the categories that apply.

_____ BELIEF (Meaning from one's religious, social, or political convictions.)

_____ GROWTH (Meaning through self-improvement and understanding. May include reaching goals, developing talents, increasing self-worth, or increasing independence.)

_____ HEALTH (Meaning in life from maintaining physical and/or mental health.)

_____ LIFE WORK (Meaning derived from one's occupation, job, work [this may include schooling]; however, a homemaker finding meaning in her/his family should check the "relationships" category.)

_____ OBTAINING (Meaning in life derived through acquiring possessions, respect, and/or responsibility.)

_____ PLEASURE (Meaning derived from living and experiencing life to the fullest.)

_____ RELATIONSHIPS (Meaning in life comes through interaction with family, friends, and/or romantic partners.)

_____ SERVICE (Meaning is derived from a helping, giving orientation toward life.)

_____ MISCELLANEOUS (Anything else that does not fit into the above categories.)

Explain:
APPENDIX D

INSTRUCTIONS FOR SCREENING SAMPLE

This experiment involves completing a short questionnaire about recent experiences in your life and about your recent thoughts and feelings. Your responses on the questionnaire will be anonymous and confidential. A three-digit code has been placed on each questionnaire for recording purposes. For your participation, you will receive one hour of experimental credit. The principle investigator in this research is Dr. W. Bruce Walsh.

Half of those completing the questionnaire will have the opportunity to earn three additional hours of experimental credit by agreeing to participate further in this study. Your additional participation will involve two other sessions during which you will be asked to complete some additional forms. For attending those sessions, you will receive three hours of experimental credit. The first of these two sessions will take place within the next two weeks, and the final session will take place during the sixth or seventh week of the quarter.

If you are willing to be considered for this additional participation, it is essential that you write the three digit code from this questionnaire on your experiment card. This is necessary because you will need this code in the additional two sessions. Also, at the end of the questionnaire, there is a form on which you are requested to indicate your first name, your phone number, and a convenient time for us to call you if you are among those invited to participate further. If you are called, at that time we will schedule you for the next session. Throughout the study you have the right to withdraw at any time.

Please note that completing the form at the end of the questionnaire doesn’t mean that we will definitely call you, it simply is your indication of your willingness to participate further in our study. If we don’t reach you within the next two weeks, you can be sure that you will not be contacted for additional participation.

Thank you for completing the questionnaire. Please return it tomorrow to your instructor.
APPENDIX E
FORM FOR SUBJECT RECALL

If you are willing to be contacted for further participation in this study (and receive an additional three hours of experimental credit for that participation), please complete the form below. The additional participation will involve two sessions, with one session occurring within the next two weeks and the other during the sixth or seventh week of the quarter.

Please give your first name, and a telephone number where we are likely to be able to reach you at the time you indicate.

Completing this form indicates your willingness to be called for additional participation. It does not mean that you will definitely be contacted. If you are not called within the next two weeks, assume that the required number of participants has been reached and that you will not be contacted.

PLEASE REMEMBER TO WRITE YOUR THREE-DIGIT CODE ON YOUR EXPERIMENT CARD SO YOU WILL HAVE IT FOR THE ADDITIONAL SESSIONS.

Thank you for your willingness to be a part of our research.

-------------------

First name: __________________

Telephone number where you can be reached: ___________

What days of the week and times of the day are best for reaching you?

Days: Time of Day:
Because the presentation of the primary hypothesis of the study was brief and only presented once, it was important that it be as memorable as possible. In an attempt to achieve this end, an audio-visual presentation was used which falls into the genre of "rap."

"Rap" is characterized by rhythmic verse accompanied by percussion and little or no music. Typically, there is a chorus repeated throughout the piece following each verse. A popular example of "rap" is the "Super Bowl Shuffle" produced by the National Football League's Chicago Bears in late 1985. "Rap" was chosen for this presentation because of its appeal to the college student population, the repetition of the key verse, and its easy rhythm which aids recall of the verse. The presentation utilized an audiotape of the "rap" accompanied by a script containing a few cartooned illustrations.

The metaphor of a chair needing a number of independent sturdy legs for stability underlies the content of the "rap." The notion is that a chair with many independent legs is better able to withstand injury to one leg than is a chair with fewer legs, or many legs that are interdependent. The story line for the "rap" centers on a group of personified chairs, "The Rappin' Chairs." Members of the group are as follows: 1) "Foldin' Chair" has only three connected legs, is easy to manage, but collapses easily; 2) "Easy Chair" is heavy and rather bulky, packs a great deal of weight onto four legs, and is stable unless one leg is broken; 3) "Lounge Chair" is rather flexible and has six independent legs upon which it can rest depending on its position; 4) "Rockin' Chair" is able to move freely, its weight being dispersed over a number of legs, and can experience the loss of a few legs without significant impact upon its stability. The essence of the story line of the "rap" is that having a number of legs makes a chair less likely to lose its stability when one leg is lost or negatively impacted. The legs for each chair are described in terms of self-aspects, including roles, superordinate personality traits, and activities. The recurring theme of the "rap" is: "...lots of great legs keeps a chair rappin'!" The entire script follows.
The Rappin' Chairs

WE'RE THE RAPPIN' CHAIRS AND WE'RE HERE TO SAY,
"LOTS OF GREAT LEGS WILL KEEP YOU RAPPIN' TODAY.
LISTEN UP NOW AND WE'LL TELL YOU WHY,
WHAT WE HAVE TO SAY JUST AIN'T A BUNCH OF JIVE.

When we speak about a leg now here's what we mean,
A leg is a role, or some such thing,
You may be a scholar, a roomie, and a friend,
You may be a person who would lend a helping hand.
Your hobbies and abilities do classify
And also your quirks, such as being sly,
All of these are legs on which your "self" is built;
The more legs you've got, the less you will tilt.

We four Rappin' Chairs will now speak about
Our very own legs, some of which are stout.
You'll see that Foldin' Chair appears just fine,
But Rockin' Chair is sturdiest more of the time.
Think about your roles, traits, and skills,
The things you like and the things that give you thrills.
The many different ways you think about yourself
Can all be legs that will keep you in good health.

WE'RE THE RAPPIN' CHAIRS AND WE'RE HERE TO SAY,
"LOTS OF GREAT LEGS WILL KEEP YOU RAPPIN' TODAY.
LISTEN UP NOW AND WE'LL TELL YOU WHY,
WHAT WE HAVE TO SAY JUST AIN'T A BUNCH OF JIVE.
I'm Foldin' Chair and my thinking is simple—
With just three legs and a cute little dimple.
One leg is athlete, another is son,
The third is friend; they're just about all one.
When I have a great game, I feel like number one,
Both as a friend and also as a son.
But when I've done lousy and I feel real bad,
I feel like a loser for my friends and for my dad.

My name is Easy Chair, I take it real slow.
I rest on four legs, so easy don't you know.
I'm a musician, and I'm a mom,
I'm also a funny gal, and have a horse farm.
My legs are independent, and that's just fine,
A hurt in one doesn't dominate my time.
If I lose a leg, I've still got three,
But I'd be a little lopsided, don't you see?

WE'RE THE RAPPIN' CHAIRS AND WE'RE HERE TO SAY,
"LOTS OF GREAT LEGS WILL KEEP YOU RAPPIN' TODAY.
LISTEN UP NOW AND WE'LL TELL YOU WHY,
WHAT WE HAVE TO SAY JUST AIN'T A BUNCH OF JIVE."
They call me Lounge Chair and I am flexible,
I do many things, you could say adaptable.
I have six legs on which I can recline,
I only need four at any given time.
A student, a boater, I paint now and then,
I ski, I cook, and I have a pet hen.
When my boat is down I don't lose sleep,
I look at my art and think it's real neat.

Now I'm Rockin' Chair and I move freely,
I have lots of legs but I'm really not greedy.
I like to think of myself as diverse.
There's only one me in the whole universe.
I am the chair of which it can be said,
Lots of different legs keep me ahead.
To give your life more balance, strive to be
A multi-legged dude, just like me.

WE'RE THE RAPPIN' CHAIRS AND WE'RE HERE TO SAY,
"LOTS OF GREAT LEGS WILL KEEP YOU RAPPIN' TODAY.
LISTEN UP NOW AND WE'LL TELL YOU WHY,
WHAT WE HAVE TO SAY JUST AIN'T A BUNCH OF JIVE."

WE'RE THE RAPPIN' CHAIRS AND OUR MESSAGE IS CLEAR,
"LOTS OF GREAT LEGS WILL KEEP YOU RAPPIN' ALL YEAR."
Following the "rap", a brief didactic presentation will be made reinforcing the purpose and point of the "rap." The text of that presentation follows.

SCRIPT TO BE READ FOLLOWING "The Rappin' Chairs"

(Groups A and C only)

I hope you enjoyed the "Rappin' Chairs."

The study in which you are participating is built upon some earlier research which suggests that persons who think about themselves as having many diverse aspects are less susceptible to stress-related illness. The presentation you have just seen attempted to illustrate this using the metaphor of a chair with many legs.

Suppose the primary way you think of yourself is as a student, and every other part of your life is related to being a student... you feel your parents' approval is dependent upon your getting good grades, the only time you spend with your friends involves studying, and so on. If you get poor grades this quarter, that will affect not only your feelings about yourself as a student, but also your feelings as a son or daughter, and your feelings as a friend. On the other hand, if being a student is only one aspect of your life independent of other aspects, such as being a friend, a musician, an athlete, or a reader, you will have more on which to fall back for feeling good about yourself, if you get poor grades.

In this study, you aren't being asked to go out and develop new hobbies or skills so you have more ways of thinking about yourself. What is being asked of you is this. Given the involvements you have in your life at the present time, try to think about yourself in as many different ways as you can. For example, take the category student. It is possible to break down this aspect of yourself into smaller categories, such as reader, test-taker, colleague of other students, researcher, and so on. If you score poorly on a test, you may not feel good about yourself as a test-taker, but you can still feel good about yourself as a reader, colleague, and researcher.

If it sounds as if I am asking you to stretch your imaginations, that is indeed the case. We are hoping to discover whether thinking about yourself in an expanded number of ways can be healthy for you, without making a lot of changes in your daily involvements.
(Group A only)

During the next few weeks until you return for the final session of this study, remember the Rappin’ Chairs and try and think about yourself in more ways than you usually do. Stretch your imaginations. Focus on those aspects of yourself which make you feel good about yourself. We have good reason to believe that this can be to your advantage by making you a bit less susceptible to colds, flu, and other aches or pains.

I will now schedule you for your final session. Please do return as your participation at that time is crucial to our research.

(Group C only)

I now have a paper and pencil exercise for you to complete which is designed to aid you in the process of thinking about yourself in an expanded number of ways. Instructions are printed on the packet which I will give to you.
APPENDIX G

SELF-DIVERSITY EXERCISE

Three-digit code: _____ _____ _____

PLEASE PLACE YOUR THREE-DIGIT CODE IN THE BLANKS ABOVE.

One of the goals of this study is to examine the diversity with which persons are able to view themselves. In other words, in how many different independent ways are you able to think of yourself? While it is possible to think of yourself in many ways apart from the various roles you may have in your life (e.g., student, daughter/son, friend, employee, etc.), this exercise will focus on such roles.

The purpose of the exercise is to have you think about yourself as a person who has many roles, many interests, and many feelings. Hopefully you will discover that you are able to think about yourself as a more diverse person than you typically view yourself.

On page 3 you will see a list of various roles that students might have. The task of this exercise is to think of yourself as having as many of these roles as possible, no matter how much you need to stretch your imagination to connect yourself to a given role. Your goal is to connect yourself to as many of these roles as possible, with a minimum of 15 roles. For each role you choose you are asked to write a brief sentence (or two if necessary) mentioning how you see yourself having that role. Next, you are to choose a word from the list on page 4 of the packet which best describes how you feel when you think about yourself in each role.

Beginning on the fifth page are your recording sheets. For each number, there is: 1) a blank for you to list the role; 2) a few blank lines on which you are to write a sentence describing how you see yourself in that role; and 3) another blank for you to list the word from the list on page 4 which best describes how you feel when you think about yourself in that role.

Examples: 1. student
   I am a student because I am enrolled at Ohio State.
   self-confidence.
2. **healthy person**  
   Because I eat breakfast every day, I am a **healthy person.**  

   **strength**

   A good way to begin this exercise is to start with those roles that are most obvious for you. Then begin to stretch your imagination to link yourself to as many roles as possible. Remember to do at least 15 roles but beyond that do as many as you can. As much as possible, work to identify roles for which you have positive feelings.

   If you are unclear about any of these directions, please ask the experimenter for clarification.

   When you have completed the exercise, read the last page of the packet for further directions.
<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helper</td>
<td>One who enjoys play</td>
</tr>
<tr>
<td>Friend</td>
<td>Worker</td>
</tr>
<tr>
<td>Future career person</td>
<td>Student</td>
</tr>
<tr>
<td>Social person</td>
<td>Daughter/Son</td>
</tr>
<tr>
<td>Spouse</td>
<td>Healthy person</td>
</tr>
<tr>
<td>Romantic partner</td>
<td>Involved with a hobby</td>
</tr>
<tr>
<td>Leader</td>
<td>Activist</td>
</tr>
<tr>
<td>Solitary person</td>
<td>Involved in a sport</td>
</tr>
<tr>
<td>Cultivating a talent</td>
<td>Religious person</td>
</tr>
<tr>
<td>Receiver of advice</td>
<td>Employee</td>
</tr>
<tr>
<td>Casual acquaintance</td>
<td>Successful person</td>
</tr>
<tr>
<td>Follower</td>
<td>Innovator</td>
</tr>
<tr>
<td>Quiet person</td>
<td>Sister/brother</td>
</tr>
<tr>
<td>Musician</td>
<td>Conversationalist</td>
</tr>
<tr>
<td>Subordinate</td>
<td>Parent</td>
</tr>
<tr>
<td>Reader</td>
<td>Intimate friend</td>
</tr>
<tr>
<td>Member of social organization</td>
<td>Involved in recreation</td>
</tr>
<tr>
<td>Music lover</td>
<td>Companion</td>
</tr>
<tr>
<td>AFFECT TERMS</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Joy</td>
<td>Powerlessness</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Happiness</td>
</tr>
<tr>
<td>Strength</td>
<td>Stress</td>
</tr>
<tr>
<td>Caring</td>
<td>Love</td>
</tr>
<tr>
<td>Unhappiness</td>
<td>Tenderness</td>
</tr>
<tr>
<td>Guilt</td>
<td>Solidarity</td>
</tr>
<tr>
<td>Loneliness</td>
<td>Inner warmth</td>
</tr>
<tr>
<td>Inferiority</td>
<td>Intimacy</td>
</tr>
<tr>
<td>Despondency</td>
<td>Pride</td>
</tr>
<tr>
<td>Disappointment</td>
<td>Inner calm</td>
</tr>
</tbody>
</table>
RECORDING SHEET - A

1. Role: ______________________
   Sentence describing myself in this role: __________
   Feeling associated with thinking about myself in this role:

2. Role: ______________________
   Sentence describing myself in this role: __________
   Feeling associated with thinking about myself in this role:

3. Role: ______________________
   Sentence describing myself in this role: __________
   Feeling associated with thinking about myself in this role:

4. Role: ______________________
   Sentence describing myself in this role: __________
   Feeling associated with thinking about myself in this role:
There is one final task to carry out. Review the roles with which you have linked yourself and identify five (5) roles which you previously have not thought about yourself as having and which elicit positive feelings when you think about those roles. Please list five such roles here:

1) ____________________________
2) ____________________________
3) ____________________________
4) ____________________________
5) ____________________________

Thank you for completing this exercise. During the next few weeks, try and continue this process in your mind. Keep thinking about yourself as a diverse person who has a variety of roles, can function in many different settings, has various interests, and experiences a wide range of feelings. Enjoy thinking about yourself in many different ways.

Please be sure you have copied your three-digit code on the top of page 1.

Now give this packet to the experimenter. You will be scheduled for your final session of this experiment which will take place during the seventh or eighth week of the quarter. Please do return for the final session.

Thank you for your participation.
APPENDIX H

INSTRUCTIONS FOR SESSION ONE

(Have self-complexity sort materials in cubicles before subjects arrive (trait cards, 10 blank cards, recording sheet, pencil).)

(See that subjects are seated in individual cubicles.)

Thank you for agreeing to participate in the rest of our study. For coming today and returning for the final session near the end of the quarter, you will receive three hours of experimental credit.

Today you will first of all be asked to do a sorting task which I will describe to you in a moment. Following that you will be given some questionnaires to complete...

(Group A only)

... When all of you have completed the questionnaires, we have a presentation for you. After the presentation, you will be scheduled for the final session.

(Group B only)

... When you have completed the questionnaires, you will be given a paper and pencil exercise to complete. Instructions will be given to you with the exercise. When you are finished with the exercise, you will be scheduled for the final session.

(Group C only)

... When all of you have completed the questionnaires, we have a presentation for you. After the presentation, you will be given a paper and pencil exercise to complete. Upon finishing that exercise, you will be scheduled for the final session.

(Group D only)

... When you have completed the questionnaires, you will be scheduled for the final session.

(All groups.)

Please remember to place your three-digit code on all of your materials. At this time please place your three-digit code on the recording sheet in front of you.

Are there any questions?
Begin reading the instructions for the self-complexity sorting task.

As each subject finishes the self-complexity sorting task, collect those materials. When all have completed this task, hand out the questionnaire containing the CHIPS, HBRS, and MILC. Remind subjects to place their three-digit code at the top of the questionnaire.

While subjects are completing the questionnaire, write the appropriate group letter at the top of each self-complexity recording sheet.

When all subjects have completed the questionnaire, collect them and hand out the PIL. Tell subjects to place their three-digit code in the "name" space, and fill in the blanks for sex and age. Then instruct subjects to complete only Part A of this form.

When all subjects have completed the PIL, proceed with the appropriate intervention.

When the intervention has been completed, schedule subjects for Session Two. Have them sign their names on a sign up sheet and also give their phone numbers so a reminder call can be made. Remind them to write the time for the next session on their experiment cards. They will be given their three hours at that time.
APPENDIX I

INSTRUCTIONS FOR SESSION TWO

(See that subjects are seated in individual cubicles.)

Thank you for returning for the final session of our study. Today's session will again involve doing a sorting task and completing some questionnaires. After completing the questionnaires, you will be given a brief summary of the purpose of this research to read. I will then sign your experiment cards before you leave.

Once again, please remember to place your three-digit code on all of your materials.

Are there any questions?

(Hand out self-complexity materials and begin reading the instructions for that task.

As each subject finishes the self-complexity task, give her/him the LES/PSS to complete, followed by the CHIPS/HBRS/MIL and PIL, respectively. Upon completion of the PIL, give each subject the "Research Summary" sheet to read and an opportunity to leave a forwarding address for research results if desired. Answer remaining questions and sign experiment cards.)
APPENDIX J

DEBRIEFING HANDOUT

The primary question this research hopes to answer is whether or not persons can become less susceptible to stress-related illness by expanding the diversity with which they think about themselves. Using a brief presentation or a short paper and pencil exercise, participants were encouraged to think about themselves in a greater number of independent ways. You were in one of four subject groups:

A - presentation (Rappin' Chairs)
B - paper/pencil exercise (Self-Diversity Exercise)
C - both presentation and exercise
D - neither presentation nor exercise (control group)

Previous research suggests that persons who think about themselves as having a greater number of independent aspects are less susceptible to stress-related illness when under stress.

You were asked to participate in this study because your score on the first questionnaire indicated that you were average or above average in either the number of stressful life events you have experienced recently or the amount of stress you perceive in your life, or both.

The research measured self-complexity (sorting task), recent life events, perceived stress, physical symptoms, positive health behaviors, and purpose and meaning in life. The last two measures were included to determine whether persons who think about themselves in a greater number of independent ways have a stronger sense of purpose and meaning in life.

If you would like to receive a summary of the results of this study, please leave a forwarding address with the experimenter.

Also, if you have questions about the study that haven't been answered by this brief summary, ask the experimenter for further clarification. Please return this sheet to the experimenter.

Again, thank you for participating in the study. Be sure to have your experiment card signed before you leave.

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APPENDIX K

EXPERIMENT 2 PARTICIPANT SOLICITATION MEMO

Subject: "Brown Bag Lunch"
Stress Management Seminar/Research

Date: March 25, 1988

From: Bruce Walsh & Paul Hershberger, Department of Psychology
Dr. Andy Hudson, Director, Educational Resources
To: First & Second Year Veterinary Students

You are invited to attend a "Brown Bag Lunch" seminar on stress management. The seminar, conducted in conjunction with the Department of Psychology, is designed to teach basic stress management procedures and to collect data regarding stress and health among veterinary students. Your participation is strictly voluntary. We believe this seminar will be very helpful in managing the stress that goes with being a veterinary student. Data collected will be strictly anonymous and confidential.

The seminar consists of two sessions. The first will be held twice during the second week of classes and there will be a follow-up session held twice during the seventh week of classes. You need attend only once per week.

If you wish to participate, please circle the one time during each week which is best for you. All sessions will be held in the AT Classroom on the dates indicated. Be sure to bring your lunch and join us for this informative seminar and important research project. Thank you.

NAME ___________________________________________ VMEI  VMEII
(please circle)

I WOULD LIKE TO PARTICIPATE IN THE STRESS MANAGEMENT SEMINAR AND WILL ATTEND THE FOLLOWING SESSIONS:

SESSION I (pick one date):
☐ Tuesday, April 5, Noon-1 p.m.
☐ Thursday, April 7, Noon-1 p.m.

SESSION II (pick one date):
☐ Tuesday, May 10, Noon-1 p.m.
☐ Thursday, May 12, Noon-1 p.m.

PLEASE RETURN THIS FORM TO THE AT LAB BY THIS THURSDAY, MARCH 31.