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The effect of twelve weeks of exercise on depression, self-esteem, and locus of control in a wellness program sample of women aged 65 and older

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THE EFFECT OF TWELVE WEEKS OF EXERCISE ON DEPRESSION, SELF-ESTEEM, AND LOCUS OF CONTROL IN A WELLNESS PROGRAM SAMPLE OF WOMEN AGED 65 AND OLDER

by

Virginia Rau Knittle

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ABSTRACT

Because half of age-related physical losses result from inactivity and disuse, and loss frequently antecedes depression and decreased self-esteem; exercise intervention offers potential physiological and psychological benefits. Self-efficacy and personal control is additionally promoted in a wellness concept exercise program.

The effect of twelve weeks of wellness-oriented exercise upon depression, self-esteem, and locus of control orientation is studied in an exercise and non-exercise control group of community residing women 65 and older.

Statistically significant post-exercise changes result from reductions in two self-report measures of depression in the exercise group, and increased self-esteem scores in the control group. A non-representative sample may account for high pre-exercise scores in all three dependent variables.

A replication with a larger, random, representative sample of older people and domain-specific measures is recommended to improve the study of hypothesized psychological benefits associated with exercise.

CHAPTER 1

INTRODUCTION

The awareness and importance of physical fitness is evident in the increasing numbers of older Americans engaged in healthful physical activities. An early morning visit to many shopping malls routinely reveals dedicated older walkers briskly pacing their steps and monitoring their pulses to be sure they are in their training range to subsequently benefit their cardio-vascular system. A plethora of fitness programs designed for the 55 and over age group are offered at Senior Citizen centers, through community education programs, at Y.M.C.A's, universities and colleges, private health clubs, and retired residential sites. Publications geared toward the older reader feature articles on the benefits of exercise while the accomplishments of Senior Olympic participants and Masters athletes impress readers of all ages that vitality is not restricted to youth.

The efficacy of physical activity for the aging body is overwhelming. Benefits for the musculo-skeletal, respiratory, cardio-vascular, nervous, and endocrine

systems have been empirically shown (MacRae, 1986; deVries, 1986; Smith and Serfass, 1981; Wiswell, 1980; Shephard, 1978; Brunner and Jokl, 1970). Smith and Serfass (1981) state that current research suggests 50% of the decline attributed to physiological aging is in reality disuse atrophy resulting from inactivity in an industrial world. Since experts in the medical profession concur that the single most effective way to accelerate the aging process is to do nothing, exercise has been acclaimed the most potent "anti-aging" drug now available (Conrad, 1976).

The psychological benefits from improvements in physical fitness have been more elusive to establish empirically.

In a review of the studies which claim psychological changes as a result of fitness training, Folkins and Sime (1981) conclude that such implications are oversimplified and mechanistic. Studies on mental health benefits from physical fitness frequently appear to have been poorly designed and atheoretical. Folkins and Sime concede, however, that improved mood and feeling of self-concept can be associated with fitness training.

Self-concept is defined by Rogers (1951) as an organized configuration of perceptions of the self which are admissable to awareness. Self-esteem is generally

regarded as the evaluative component of self-concept and is defined as the extent to which the person feels positive about himself (Gergen 1971). While a distinction attributes description to self-concept and evaluation to self-esteem, the two terms are often used interchangeably (Shavelson, Hubner, and Stanton, 1976).

Three years after the review by Folkins and Sime which cited self-concept (self esteem) as one of the variables studied in exercise/psychological benefits studies, Sonstroem (1984) reviewed 16 studies and stated that exposure to physical training programs is associated with increased self-esteem scores. It was not possible, however, to certify that increased fitness influenced these scores or that these scores were related to enduring aspects of self-concept. Sonstroem concluded that a perception of improved fitness could be related to a change in self-esteem scores, and that a person's information about fitness training effect may be as or more important than the physical changes themselves (Heaps, 1978; Leonardson, 1978).

A state-of-the-art workshop sponsored by the Office of Prevention of the National Institute of Mental Health issued a series of consensus statements on exercise and mental health in the Spring of 1984. Their findings were:

(1) Physical fitness is positively associated with mental health and well-being.

(2) Exercise is associated with the reduction of stress emotions.

(3) Anxiety and depression are common symptoms of failure to cope with mental stress, and exercise has been associated with a decreased level of mild to moderate depression and anxiety.

(4) Current clinical opinion holds that exercise has beneficial emotional effects across all ages and in both sexes (Morgan and Goldston, 1987).

Depression is catagorized as a multi-faceted, multi-dimensional, multi-causal, complex phenomenon (Chaisson-Stewart, 1985). Depression has been seen as "endogenous" or arising from a deranged biochemistry and as "reactive" to experiences in the individual's life. Nature being complex, it seems likely that depression is the symptomatic manifestation of multiple etiologic factors expressed through the final common pathway we label depression (Akiskal and McKinney, 1975).

Chaisson-Stewart (1985) conceptualizes depression on a continuum, or as a single illness with two main variants. Rather than view biological and psychological causes of depression as antithetical, Chaisson-Stewart suggests a unitary concept of depression. A unitary

concept was espoused by Meyer (1905) and can be seen as compatible with the modern theory of stress (Selye, 1978) which views depression as a psychobiological reaction to life events, minimizing the importance of organic, constitutional and genetic factors (Klerman, 1974). Stress theory defines stress as a biological response syndrome that is mediated psychologically by perceptions of stressors, either real or imagined (Selye, 1978).

Because the stressors of old age are frequently associated with loss, and because loss is a major correlate of depression, the elderly are at an increased risk for depression. Depression is regarded as the most prevalent major psychiatric disorder in the older population (Neshkes and Jarvik, 1986). Eisdorfer and Wilkie (1979) state that the elderly are more susceptible to the effects of stress because they undergo many negative life events and experience many losses during a period when physical decline is concurrent.

Especially salient to this research is the concept of threat that Lazarus (1966) incorporates in a definition of stress. He defines stress as a complex psychobiological process that consists of three major elements: stressor, threat, and emotional reactions. When an event or situation is seen as threatening, whether real or imagined, the sense of threat will lead

to an unpleasant emotional reaction. Whitbourne (1985) in an application of Lazarus' cognitive appraisal of stress hypothesizes that part of the self-evaluation individuals make as their bodies age, includes their appraisal of themselves as capable of responding adequately to the environment. One of the effects of aging is the alteration of an individual's self-concept as well as the adaptation they must make to their social and physical environment.

Lazarus' theory emphasizes the importance of cognitive appraisal and coping as mediators between the behavior of a person and the environment. Negative appraisals such as threat, harm, or loss, will lead to negative emotions such as anxiety and depression.

Coping as defined by Billings (1983) consists of the cognitions and behaviors that serve to appraise the meaning of stressors, to control or reduce stressful life circumstances, and to moderate the affective arousal that often accompanies stress. Klerman (1974) considers depression to be more an adaptational failure than a psychological illness. Reker (1985) defines a coping style as a preferred mode of dealing with potential stressors.

The cognitive appraisal model of stress can be applied to fitness training and ensuing psychological

benefits in the following way. With advancing age and the increasingly sedentary lifestyle that is characteristic of so many older people, a person may begin to feel threatened by age-related changes in appearance such as weight gain, loss of physical strength, perceptions of increased risk of cardio-vascular disease, shortness of breath during physical exertion, and decreased flexibility and balance. Through the intervention of an exercise class as a readily available means of lowering the rate at which debilitative effects of the aging process occur, a sense of personal competence and control results, actual physical gains are realized or perceived, a threatened loss of self-esteem is attenuated, and the possibility of reactive depression is reversed. Not only does the physical activity participation offer improvement in physical fitness but it also may provide parallel benefits to the mental health of older adults (Ostrow, 1984).

Lazarus (1974) classifies coping responses into two classes: palliative and instrumental. Palliative coping refers to attempts to make oneself feel better without attempting to change the situation, while instrumental coping refers to attempts to solve the problem directly through appropriate action. Reker (1985) states that

internal-external locus of control is an example of a coping style. Locus of control refers to one's perceptions of events as either under one's control (internal) or beyond one's control (external). There is a growing body of literature linking locus of control in the elderly to physical and psychological well-being, mental alertness, physical health, and a reduction in mortality rate. Reker (1985) states that perhaps the most promising technique in which palliative and instrumental coping are mutually supportive is the wellness concept of health, or the mobilization of the individual's personal resources to achieve high levels of psychological and physical well-being.

The wellness concept is an approach that extends the medical treatment model beyond the alleviation of illness to a state of positive health through awareness, education and growth (Reker, 1985).

The conceptual basis for this study concerns the potential threat that the aging body poses to an older person's self-concept and self-esteem. Because physical inactivity and disuse contribute greatly to aging losses, the intervention of exercise in a wellness type program which encourages self-efficacy through education, growth, and awareness, can result in increased physical and mental well-being.

The purpose of this study is to measure the psychological effects of three months of exercise in a community sample of women 65 and older who participated in an exercise class as part of the wellness program "Project Age-Well". It is hypothesized that after twelve weeks of exercise the exercise participants will have a significant increase in self-report measures of self-esteem and internal locus of control, and a decrease in two self-report measures of depression. It is also hypothesized that a control group of women who did not take part in the exercise class will not show significant changes in these same measures.

CHAPTER 2

REVIEW OF LITERATURE

This chapter describes the literature that was researched and the areas which relate to this study. Literature concerning depression in the elderly, self-concept, self-esteem, and locus of control in aging is included. Literature concerning stress, stress and physical activity, and stress and chronic disease is followed by literature concerning the wellness concept and the association of physical activity and mental health in older adults.

Depression in the elderly

In Geriatric Mental Health (1984), Steven and Judy Zarit state that even though definitive findings about the nature and treatment of depression remain to be discovered, it is important to be aware of current theories and to draw what is useful from each.

Biological, cognitive, behavioral, psychoanalytic, recent losses, and learned helplessness are all theories that can explain the prevalence of depression among people over 65 years of age. Although there are differences with the various criteria used for

estimating the prevalence of depression, findings are consistent in that depression in old age is a substantial problem (Zarit, 1984). Depression is now recognized as being the psychiatric illness that occurs most commonly in old age (Frengley, 1987; Atchley, 1985; Butler and Lewis, 1983, 1977; Eyde and Rich, 1983; and Stenback, 1980).

Age is not the critical factor in understanding the prevalence of psychological distress and depression in older adults, however. According to Feinson (1985), even though older adults are generally perceived as more psychologically distressed and/or depressed than younger adults, age per se is not the critical factor. An analysis of studies done during the past 30 years provides evidence that mental health problems are not integral to the aging process and that such factors as physical health, social support, organizational activities and mobility, all of which may decline with advanced age, may account for depressive symptoms as measured by self-reports in older adults.

Much of what is called "depression" in the elderly may actually represent decreased life satisfaction and periodic episodes of grief, secondary to the physical, social and economic difficulties encountered by aging individuals in the community (Blazer and Williams,

1980). It is not hard to determine why depressive reactions occur with high frequency in older people. Old age has been described as a season of loss and depressive reactions, depending on their degree, and are appropriate or inappropriate resonses to loss (Kermis, 1984).

Taking an Eriksonian approach, Butler and Lewis (1977, 1983) propose that the major psychological conflict for older persons is grief versus restitution. According to Butler, adaptation depends on coming to terms with the losses that have occurred and drawing on the resources one has left, rather than grieving perpetually. Erikson's (1950) own concept of aging as a conflict between integrity and despair implicitly refers to loss. Adaptation depends on accepting the mistakes and limitations of the past, as well as the fact that one cannot go back and start over.

Stenback (1980) contends it is normally necessary for old persons, especially those 75 and older, to adapt both physically and psychologically to impaired physical function and chronic disease. These physical changes lead to changes in self-image. Persons who cannot integrate these changes into their self-concept may experience a decrease in self-esteem.

Depressed elders generally report that significant

life changes preceded depressive episodes (Post, 1962, 1972). Among the various life changes, illness is more prominent a factor in late life depression (Kermis, 1984; Botwinick, 1978; Rubenstein, Zaidi, and Kahn, 1976; Kay, Roth and Hopkins, 1955).

Seligman (1975) has proposed the theory of "learned helplessness" that links losses and depression. Studies have found that when animals are repeatedly exposed to shock and other noxious stimuli from which they cannot escape, they become withdrawn, inactive, and do not attempt to escape even when possible. Seligman believes that people who are experiencing changes over which they perceive they have no control learn to view themselves as helpless and therefore no longer take active steps to change their circumstances.

According to Osgood (1984), the high incidence of suicide in older people is a result of multiple losses throughout the later years. In addition to the losses, aging impairs a person's ability to cope with these stresses at a time when life's other resources are also diminishing.

A multidimensional model of depression has been articulated by Akiskal and McKinney (1975). Noting the findings that link depression to many different factors, including genetic, biochemical vulnerability, early

childhood losses, recent losses, stresses, and personal habits, they propose that there may be several pathways to depression. The amount contributed by each predisposing factor may vary from case to case. In one individual biological dimensions may be more important, while in another, recent stress plays a larger role. Their model takes into account the interaction between behaviors and stress on one hand and biochemical responses on the other.

Chaisson-Stewart in her book Depression in the Elderly (1985), presents a comprehensive, integrated and holistic theory of depression that interrelates multiple concepts and constructs of depression. She states that the unitary theory of depression which views depression as a single illness with two main variants on each end of a continuum, and stress theory as formulated by Selye (1978), addresses the same concepts: (A) Events, circumstances, or stressors, (B) Psychological response, and (C) Biological response. According to Chaisson-Stewart (1985), "modern neurobiological findings support the stress model and increasingly emphasize central nervous system (CNS) structures and functions as mediating and integrating the organism's response to its environment" (p.58). By integrating the two theories, a conceptual framework is proposed to explain how

depression is related to stress. Chaisson-Stewart posits that "depression can be viewed as one type of psychobiological response to stressors that are mediated by the CNS (cognitively and through the senses) to produce a syndrome of psychological and somatic systems combined" (p.59).

An increase in depression in the elderly, Lipton (1976) suggests, is probably related to biochemical changes resulting in reduced availability of the neurotransmitters that the body needs to adapt to stress.

Epstein (1976) explains that the reason depression is so prevalent in the elderly is that it occurs chiefly as a reaction to age-related stressors. Clearly with advancing age, the risk for encountering more age-related stressors in greater severity and in more rapid succession increases at a time when biological structures may be diminished in adaptive function, both changes increasing vulnerability for depression (Chaisson-Stewart, 1985).

Levin (1963) divides stressors that are unique to the aged into four categories: loss, attack, restraint, and threat. The dominant of these categories, loss, is defined as the loss of a love object or loss of anything in which narcissistic libido is invested, such as a

talent or a part of the body. Included in losses which are pertinent to this research are loss of health, mobility, body image, role, and status.

Charatan (1975) identifies loss-related stressors as loss of physical vigor and stamina, while Paykel (1979) associates losses that have strong effects on self-esteem as memory, sexual satisfaction, health, and mobility.

J. Becker (1974) proposes that depression should be conceptualized in terms of three types of perceived losses: self-esteem, game, and meaning. The loss of self-esteem goes hand in hand with the loss of hope. Hope increases with an increase in self-esteem and the two are affected by the predisposing internal factor of thoughts and the external factors (which can be facilitative or restrictive) of health, nutrition, finances, mobility or exercise, and social supports.

According to Klerman (1974), depression may be a response to helplessness and a fall in self-esteem. Fall in self-esteem, Hirshfeld (1979) feels, is a hallmark of depression. In old age, it is even harder to maintain a sense of self-esteem when the individual returns to a dependency state of earlier life stages. Being dependent in a society that values independence decreases self-esteem.

Self-concept

Definitions of self-concept reveal that it is a multi-faceted construct (Whitbourne, 1985). A fairly straightforward meaning is given by Abend (1974), as "more or less concrete anatomical self-representations" (p.412). Cooley (1902), best known for inventing the term "looking glass self", regards self-concept as including the reaction of others to oneself which serves as a mirror to reflect an image of the self. One's ideas of self are influenced by what one imagines other people think. Social factors also influence the personal perception of physical characteristics. Mead (1934) stipulates that self-concept could only develop in and with reference to a group.

Theorists on self-concept have emphasized the theme that the "me" that is reflected from our own and others views of our physical attributes form an important part of our overall self-esteem (Wylie ,1974). Rosenberg (1979) endorses social identities, personal dispositions, and physical characteristics as the three major components of self-conception. Social identities include: social status (age, sex), membership groups (Senior Citizen club member), labels (retired), derived status referent to previous status (former teacher), and social types based on common societal generalizations of

salient characteristics (inactive, disengaged). Rosenberg's second component, personal dispositions, refers to people's self-perceptions about their traits, abilities, preferences, and response tendencies (e.g. I am an active, energetic person). Physical characteristics refer to the evaluative picture an individual holds about his or her height, weight, strength, attractiveness, for example.

The importance of physical attributes to self-conception is explicity recognized by developers of self-concept inventories (Sonstroem, 1976). Zion (1963) in a study of the relationship between self-concept and body concept concludes that there is significant linear relationship between the two and it appears that the security one has in one's body is related to the security with which one faces one's self and the world. The concept of body acceptance, Zion felt, was an important consideration for mental health. Wylie (1974) states that it seems intuitively obvious that attitudes toward the body are important aspects of self regard.

Some of the components of body concept are (1) body image, (2) body cathexis, or the degree of acceptance and rejection of various body parts, and (3) body awareness (Fisher and Cleveland, 1958). Body concept also includes the self-evaluation of the effectiveness

with which one's body is functioning (Back and Gergen, 1968; Epstein, 1973; L'Ecuyer, 1981).

Kreitler and Kreitler (1970) claim that physically inactive older people have distorted body images and often perceive their bodies to be broader and heavier than they really are. Shephard (1978) showed that elderly women have greater discrepancies between their ideal and perceived body image than do elderly men. Distortion of body image produces feelings of clumsiness, anxiety and insecurity, and leads to less interest in (and perhaps fear of) participating in physical activity. This in turn leads to further physical deterioration (Harris, 1973; Shephard, 1978).

Back and Gergen (1968) speculated that as people age they may feel a diminishing influence on the environment because their bodies are less capable of action. A summary of research on older adults using the Tennessee self-concept scale which includes a measure of physical self-concept, was carried out by Thompson (1972). He reported no relationship between declining scores on physical self-concept and overall self-satisfaction.

The self-concept, or how we see and feel about ourselves in relation to the world, will have an important effect on how we grow older. Negative

feelings about oneself, physical appearance, sexual attractiveness, and job may become more intense in later years, when significant changes take place in these areas. Individuals may feel less positive about themselves, their adequacy, and their potential however. The sense of identity includes an inner assurance of continuity with the past but an awareness and acceptance of the change in the present (Neuhaus, 1982).

Aiken (1982) explains that the self-concept includes the overall value that one places on oneself as a personality, as well as evaluations of one's body and behavior. Biological factors such as physical appearance, health, innate abilities, and certain aspects of temperament are important in determining the frequency and kinds of social experiences that a person has and the degree of social acceptance that is attained. These biological factors intereact in complex ways, and they always operate in a social context. Therefore the social evaluations placed on the physical and behavioral characteristics of an individual who possesses a particular biological make-up and consequently his or her self-evaluation, depend on the specific sociocultural group to which the person belongs.

One of the few studies done on self-concept and

exercise in older people was conducted by Perri and Templar (1984-1985). Their results showed improved self-concept after fourteen weeks of exercise in participants at least 60 years of age. The researchers concluded these results indicate the participants had an increase in self-confidence and a sense of mastery over their environment, with success in becoming involved in a strenuous activity that had been previously reserved for younger participants. Sonstroem (1984) agrees that self-concept may be influenced by social comparisons and reflected appraisals, and believes changes in self-esteem are linked to achievements and feelings of competence.

Self-esteem

Ruth Wylie in her comprehensive reviews of research on the self-concept and related constructs (1968; 1974) states there are many ambiguities and inconsistencies in the usage of the constructs self-concept and self-esteem. The variety of usages can be attributed both to the wide range of theoretical perspectives bearing on self-concept and self-esteem and to the variety of measurement orientations that result. Nonetheless, increasing convergences can be noted in the definition and measurement of these constructs (Mangen and

Peterson, 1982). Self-esteem and self-concept have been conceptualized and measured both globally and in terms of relevant dimensions. Relatively few measures of self-concept are intended to be global, or all-encompassing. The majority of self-esteem measures are global in orientation.

The distinction between self-concept and self-esteem rests in a view of the self that contrasts cognitive and affective process in self-perception. Self-concept is the cognitive component of the self and consists of the individual's self-perceptions of himself or herself as an object (i.e. "what I am really like"). Self-concept emerges as a description of one's self. In contrast, self-esteem refers to the affect associated with a judgment or an evaluation of one's self. It might be assessed as high, low, positive, or negative.

A poll of 2000 Psychology Today (1973) readers showed body image to be highly related to self-esteem. Only 11% with lower than average body image possessed above average levels of self-esteem. The authors conclude "body image" is part of a larger self-concept which includes identities based on marriage, job, friendships, and other roles.

An insufficiency of empirical evidence supporting a relationship between fitness and self-esteem (Sonstroem,

1984) appears to have resulted from the propensity of investigators to restrict assessment to global measures of self-esteem. Since society provides a wide variety of social identities, occupations, avocations, and interests that people may use to develop feelings of success, physical fitness may not be important to all people. The current enthusiasm for healthy, slim bodies and physical activity has provided high social reinforcement for those individuals whose roles include those of exerciser. Roles associated with positive personal and social evaluation tend to be adopted more rapidly (Gergen, 1971).

Three investigators have established self-perceptions of physical fitness and ability as a mediating variable in the fitness, self-esteem relationship (Heaps, 1978; Leonardson, 1978; and Sonstroem, 1976). Their studies found no direct association between physical fitness and global self-esteem. They did report a relationship between fitness and self-perception or attitude about personal fitness. It is the perception or attitude about personal fitness that is related to self-esteem rather than the fitness itself.

In spite of the given stresses and losses that come with increasing age, the lack of respect frequently

shown the elderly, and the diminishing physical capacities and sometimes diminishing cognitive capacities that accompany age, Kalish (1975) does not believe self-esteem can be assumed to decrease in older people. Some studies show that self-esteem increases with age (Gurin, Veroff, and Feld, 1960), and that some persons show reduced self-esteem (Kogan & Wallach, 1961), and some show no change. Kaplan and Pokorny (1970) found that for people who had not had any recent disruptive life experiences, age was positively related to self-esteem, while a lowered self-esteem was associated with having a lower standard of living or living alone or with relatives rather than as a couple.

There are no firm theoretical reasons to expect age differences in self-concept and/or self-esteem according to Mangen and Petersen (1982). Although different theoretical paradigms suggest that a variety of variables are responsible for the development and maintainence of self-concept and self-esteem, chronological age is not, at this point, one of them. Age per se does not appear to be a causal agent: rather, it influences self-concept and self-esteem indirectly. Provided that other theoretically relevant and age-related variables such as health, retirement, and loss of spouse have been appropriately controlled, there are

no theoretical reasons to expect a change in older people.

Numerous studies by Atchley (1985) found that most older people do not have a negative self-image, and that self-esteem tends to increase with age. It is only in the absence of adequate defenses that exposure to ageism erodes the basis for self-esteem. The continuity of personality and self through time means that how we see ourselves involves not only an assessment of our current performance and character, but also our view from the past. Continuity of self is reinforced and defended when people remain in familiar environments that allow them to exercise well practiced skills providing in turn an experience of competence. The key factors Atchley found responsible for a loss of self-esteem are: (1) decline in physical capacity, (2) an already vulnerable self-image, and (3) loss of control over one's environment. A gradual decline in physical capacity can be incorporated into the self-concept. Physical changes that disrupt continuity have a much greater potential for affecting self-concept and self-esteem than do physical changes that allow continuity at a reduced level. The basis for the self-esteem of most older Americans is a highly diversified pattern of activities, roles, personal qualities and other characteristics

(Atchley, 1985). With aging our role relationships increase in duration. Older people have developed a firm idea of what they are like and they become more adept at differentiating self from a variety of roles. Self-acceptance can increase with age because of the reduction in role responsibilites (mainly child rearing and employment) and because of the increased potential for personalized role relationships over time (Atchley, 1985).

Working on the theory that older people themselves are the best ones to say what self-esteem consists of, Gifford and Golde (1975) found that a group of older people identified four dimensions of self-esteem as: (1) mastery or the capacity to use talent and skills and to continue to learn, (2) physical health, including the ability to be physically active, attractive and capable of sexual enjoyment, (3) social acceptance to include the ability to interact with friends and colleagues, and (4) religious or ethical orientation or an abiding set of beliefs.

Locus of Control

In a review of the construct of control, Rodin, Timko and Harris (1985) postulate that the need for mastery and control of one's environment has long been viewed as basic

to human motivation (Adler, 1929; deCharms, 1968; Erikson, 1950; White, 1959). More recently it has been suggested that the presence or absence of control has profound effects on people's emotional, cognitive, and physical well-being (Glass and Singer, 1972; Seligman, 1975; Wortman and Brehm, 1975).

Much has been written on how and why personal control is influenced by growing old with the majority of theorists hypothesizing that the elderly experience a decline in both objective and subjective control. Specifically, environmental and biological events are thought to decrease the two types of control, which are postulated to act as determinants of one another. Rodin (1986), for example, suggests that aging frequently produces lowered perceived control because many environmental events that accompany old age result in limits on the range of outcomes that are attainable. These environmental factors include the losses of roles, norms, and appropriate reference groups, which are often created by major life events such as retirement and bereavement (Kuypers and Bengston, 1973). Weisz (1983) emphasizes the association between old age and loss of actual contingency for a number of important outcomes: for instance retirement entails a loss of contingency in the world of work, and one's health status depends less on

voluntary behaviors and more on biological forces. Indeed these biological changes that occur in late adulthood, particularly acquired deficits in one's physical abilities, may induce generalized feelings of lack of control, as well as actual helplessness (Rodin, 1986; Schulz, 1980).

Yet another challenge to the sense of control of older people is presented by negative stereotypes that exist with respect to the aging process (Butler, 1970). Kuypers and Bengston (1973) argued specifically that the elderly are quite susceptible to social labeling, and that the consequences of generally negative aging labels in Western societies involve the loss of coping abilities and the internalization of a sense of incompetence. Rodin & Langer (1980) suggest that negative labeling and stigmatization contribute to behavior on the part of older individuals that confirms the prevalent stereotypes of old age and so lead to lowered self-esteem and diminished feelings of control. Bandura (1981) described the elderly as a group particularly likely to underestimate their true competence in a number of important areas.

Not only do negative stereotypes of aging influence judgments of self-efficacy, but an older person's observations of other, less competent elderly, through the media or personal contact, also may lead to modeling of

helpless behaviors (Bandura, 1977).

Rotter's (1966) I-E scale treats locus of control as a unidimensional construct, with beliefs in internal and external control representing opposite poles of a continuum. Using this scale, investigators have found greater internality, greater externality, and no differences when comparing older and younger subjects. Rotella and Bunker (1978) and Wolk and Kurtz (1975) found noninstitutionalized elderly were more internal than normative scores for younger samples. In a cross-sectional study, Gatz and Siegler (1981) found that middle-aged and elderly were higher in internality than college students. Subsequently Siegler and Gatz (1985) evaluated data from a six-year longitudinal study of a cohort of 46 to 69 year olds, and found a decrease in internality over time. Cicirelle (1980) showed increasing externality with progressing age, and Lao (1975) showed that people over 60, and teenagers were more external than middle-aged subjects. Using non-institutionalized samples, many studies found no association between age and internal-external perception of control (Brown and Granick, 1983; Hunter, Linn, Harris, and Pratt, 1980; Krantz and Stone, 1978; and Kuypers, 1972).

The lack of consistency in the results of studies using unidimensional measures of locus of control makes it

impossible to state conclusively whether or how control perceptions change in old age (Rodin, Timko, and Harris, 1985).

Although Rotter's scale has been extensively used within and outside the field of gerontology, it has been widely criticized. One of the major criticisms concerns Rotter's (1966) original assumption that locus of control orientation represents a one-dimensional construct (Lefcourt, 1966, 1981; Phares, 1973, 1976).

The issue of whether control is most usefully conceptualized as a uni- or multidimensional construct is crucial to gerontologists, because age could be differentially related to different control dimensions (Lachman, 1986; Rodin, 1986). For example, Lachman (1986) hypothesizes that because aging sensitizes people to the role of chance and luck in their lives, and because the aged come to see younger people as more powerful than themselves, the elderly should appear more externally oriented. At the same time, because older individuals have accumulated a vast number of mastery experiences in at least a few domains, their belief in internal control may increase, especially if realistic adjustments are made in particular expectations or goals. Lachman's own work has not confirmed these hypotheses, however.

Despite using Levenson's (1974) multidimensional

measure of control in response to criticism of Rotters's unidimensional scale, the age-control relationship still has not been conclusively resolved.

Weisz (1983) specifies that for people to make accurate judgments of their capacity for control, they must be able to gauge two factors. First, they must be able to judge the degree to which an outcome is contingent upon their behavior, and second, they must be able to judge their degree of competence in producing the behaviors upon which a desired outcome depends. Additionally, individuals must be able to combine these two factors correctly into a composite control judgment. Studies have provided little direct evidence as to the accuracy of contingency reasoning among the elderly.

A further explanation of conflicting findings may involve the global nature of the measures used. Although Rotter states that generalized assessments concerning locus of control are appropriate and meaningful for many research purposes, Rotter (1975) acknowledged domain-specific measures could achieve a higher level of predictability.

Lachman (1986) and Rodin (1986) have both agreed that domain-specific measures may be more appropriate for use with the aged than generalized measures. They hypothesize that locus of control expectancies may show differential

age changes across different domains, so that general measures may mask important age changes. Underlying this hypothesis is also the assumption that situations do not have uniform meanings across the life span. For example, health and intellectual functioning are two areas in which expectancies of personal efficacy may change with old age.

Another issue in interpreting the studies examining the relationship between aging per se and feelings of control is overreliance on cross-sectional data. As has been noted many times in the study of aging, conventional cross-sectional investigations of age-related changes confound age-related and cohort effects. In addition to cohort effects on control expectations, there is likely to be intra-cohort variability. Such demographic factors as gender, socioeconomic status, education, and race have all been found in some studies to be related to various measures of perceived control, within and across different age groups, including the elderly.

Rodin, Timko and Harris (1985) suggest that studies done on locus of control may appear contradictory and unclear because age per se may not bear a direct relationship to control expectancies. Rather, the authors propose, "age may exert its effects by influencing the relationship between variations in personal control and psychological and physical well-being. Thus one would look

for correlations between age and the effects of control-relevant manipulations on psychological and physical well-being, rather than for direct correlations between control and age per se. While lack of personal control is potentially damaging for people of all ages, the elderly may be psychologically and physically more vulnerable to the negative effects of uncontrollability because of environmental and physiological changes that commonly occur in old age" (p.14).

Research investigating the association between control and psychological adjustment typically equates psychological adjustment with greater life satisfaction, positive self-concept, positive affect and feeling young for one's age. Palmore and Luikart (1972) found that locus of control was the third strongest predictor of life satisfaction (after self-rated health and organizational activity), with internality making a significant positive contribution to satisfaction. Wolk and Kurtz (1975) report that internal, noninstitutionalized elderly are both more satisfied with their lives and better adjusted than their external counterparts. Hunter, Linn and Harris (1981-82) found feelings of perceived control to be related to self-esteem. Among noninstitutionalized elderly, internality was positively related to better coping abilities, greater adaptability and less defensiveness (Kuypers, 1972). Wolk

and Kurtz (1975) found that internals were more active than externals.

People who perceive events as controllable by their own responses and who are reinforced for making those responses are further afforded a more predictable environment, and predictability in itself has a strong positive effect on psychological well-being (Seligman, 1968; Weiss, 1971). The attributions people make for uncontrollable events are another mediator between control and psychological state in that attributions are linked to levels of self-esteem and depression. Abrammson (1978) in a reformulation of learned helplessness, hypothesized that if events are attributed to internal rather than external sources, helplessness involves loss of self-esteem. If events are attributed to stable rather than unstable causes, helplessness is expected to persist over time; and if events are attributed to global as opposed to specific sources, helplessness should generalize across a variety of domains.

Rodin (1978) focused on the potentially harmful effects of attributing negative outcomes to nonmodifiable sources. Specifically, she presented an analysis of older people's tendency to overattribute negative physical symptoms to aging per se, and underattribute health problems to situational factors, such as the occurrence of

stress-inducing events. When physical declines are attributed to the aging process, they may be seen as inevitable and thus nonmodifiable, so that remedial steps that could be beneficial may not be undertaken.

Perceptions of control may influence whether actions are taken to prevent and remedy health problems. These include gathering health-related information, engaging in self-care behaviors, being active in interactions with medical providers, and showing better compliance with medical regimens. People high in perceived control may be more likely to take action to enhance their health status. Wallston and Wallston (1982) support the hypothesis that individuals with higher levels of perceived control take greater responsibility for meeting their health needs. Wallston, Maides, and Wallston (1976) found that people classified as internals who highly valued health indicated a greater willingness to read information on hypertension than externals who also valued health highly. Among participants in an exercise program, internals were less likely to drop out than externals (Dishman, Ickes, and Morgan, 1980). Sonstroem and Walker (1973) determined internals were more likely to engage in physical exercise. These studies indicated that there may well be direct effects of feeling of control on behavior in health-related areas, which in turn improve health or modify disease. A

review of perceived control and health-related behaviors by Strickland (1978) showed a connection between internality and preventative or health-maintenance behaviors.

Research based on Bandura's theory of self-efficacy (1977) provides support for behavioral change as a mediator of the relationship between feelings of control and health outcomes. Since self-efficacy also affects the amount of effort devoted to a task, and the length of persistence, adherence to medical regimens might be more consistent and longer-lasting among people high in self-efficacy expectations.

Although Rodin, Timko and Harris (1985) emphasized the benefits derived from increased personal control for older people in particular, they do not suggest that it is universally beneficial to feel increased control. People differ in their desire for personal control, and there are some conditions in which perceived control is more likely to induce stress than to have a beneficial impact (Averill, 1973). Consistent with the proposal that variations in control have the most impact on the aged, Rodin, Timko, and Harris, (1985) propose that individual preferences for control may show greater variability in the aged than in younger groups. Engaging in futile attempts to control events that are actually uncontrollable is likely to have psychological and physiological costs (Janoff-Bulman and

Brickman, 1980; Schulz and Hanusa, 1980; Wortman and Brehm, 1975). Excessive feelings of responsibility may be aversive (Averill, 1973; Rodin, Rennert, and Solomon, 1980; Thompson, 1981) and personal control often places heavy demands on people in the form of a high investment of time, effort, resources and the risk of the consequences of failure. The psychological cost of control may be greater for older people because they may have more extreme reactions to stress than other age groups, and because stress may accelerate the aging process (Eisdorfer and Wilkie, 1977).

Rodin, Timko, and Harris (1985) state that future research is needed to explore the hypothesis that the negative effects of loss of control are most profound for the aged and to clarify the mechanisms by which increased control benefits the psychological and physical health of older age groups. Based on present understanding, perceived competence and environmental contingency figure importantly in the health and well-being of older people.

Stress

Stress is an integral element in the biological scheme of any living organism. All living things are designed with innate stress-alarm reactions which enable them to cope effectively with their environments (Pelletier, 1977). Spielberger (1987) states that "stress is an integral part of the natural fabric of life and coping with stress is an everyday requirement for normal human growth and development" (p. 11).

The subject of stress has received considerable attention in recent years. It is now widely recognized that prolonged stress may cause a variety of problems such as allergic reactions, dermatitis, gastrointestinal upsets, hypertension, depression, and anxiety (Morgan and Goldston, 1987). It is not known why some individuals seem to be predisposed to respond with such reaction when stressed, nor is it clear why other persons are essentially resistant to the same stressors. Hurricanes, floods and wars are examples of catastrophic stressors that exert tremendous pressures on large masses of people. Marriage, taking an examination, deadlines, family relationships, retirement, and old age are all included in the ubiquitous sources of stress (Spielberger, 1987).

For older adults stress assumes special significance

because of the frequency and intensity of stressful life events experienced during a life stage when economic, physical, social and psychological resources are diminishing (Rosow, 1967).

Old people experience guilt and tension as approaching death brings to mind the omissions and commissions of a life once lived. Feelings of impotence and helplessness, and of loss and decline, all demand new modes of adaptation when the aging nervous system is increasingly vulnerable to stress (Butler, 1977). Autonomic activity is heightened in the elderly, they are more prone to overactivity, and the inefficiency of previously functional homeostatic feedback mechanisms necessitates more time for the elderly to return to a relaxed state (Schulz, 1982).

With age, a person generally produces fewer hormones, and the hormones produced are not adequately received by the target organs. The total effect of the changes in the endocrine and immune systems is that aging persons show an increasing inability to adapt to stresses from the inner and outer environments, such as infections, temperature change, and psychosocial distress (Kermis, 1986).

Hans Selye (1974) explains his conception of stress in this manner. "Stress, like success, failure or

happiness means different things to different people so defining it is extremely difficult. The problems that people face are totally different but medical research has shown that in many respects, the body responds in a stereotyped manner, with identical biochemical changes, essentially meant to cope with any type of increased demand upon the human machine". (p.25-26).

Stress in the 18th and 19th century became popularly used to denote a force, pressure or strong influence acting upon a physical object or person that induced a "strain" in the object. Thus, in common sense terms stress refers to both the situation or circumstances that place physical or psychological demands upon an individual and the emotional reactions that are experienced in these situations. The popular usage implies that stress causes strain (Spielberger, 1987).

People are much more complex than inorganic materials and they have the ability to anticipate the future and to interact with and change the environment.

Whether or not a stressful situation produces worry or anxiety will depend on how the situation is perceived or interpreted, and on the individual's coping skills. Reactions to a situation or event will depend on how the particular circumstances are perceived or appraised. When

a person appraises a situation as potentially harmful or threatening, he or she will experience an emotional reaction. Threat appraisals are influenced, of course, by the characteristics of a situation, and objectively dangerous circumstances are generally perceived as threatening by most people. The thoughts and memories that are stimulated by a particular situation, and an individual's coping skills or previous experience with similar circumstances, can have an even greater impact (Spielberger, 1987).

The concept of threat is central to Richard Lazarus' (1966) definition of stress as a complex psychobiological process that consists of three major elements: stressor, threat and emotional reactions. The term stressor refers to any stimulus situation or event that is objectively characterized by some degree of physical or psychological danger. Threat refers to an individual's perception or appraisal. When the event or situation is seen as threatening, irrespective of whether the danger is real or imagined, the sense of threat will lead to an unpleasant emotional reaction (Spielberger, 1987).

Anxiety and anger are the primary emotional reactions to appraisals of threat and frustration. The objective characteristics of a situation, the thoughts and memories

that are elicited or recalled, and the individual's coping skills and previous experience in dealing with similar circumstances all contribute to the appraisal of a situation as more or less threatening.

Two ways of reducing the anxiety aroused by an external danger are simply to avoid the source of danger or to modify the environment so the danger is reduced or eliminated. Psychological defense mechanisms modify, distort, or render unconscious the feelings, thoughts, and memories that would otherwise provoke anxiety.

Stress and Physical Activity

There is considerable cross-sectional evidence, and some longitudinal data, suggesting that physical activity of a vigorous nature represents a natural, inexpensive, and effective means of coping with mental stress (Morgan, 1981, 1982, 1984,1985; Kermis, 1986; Wiswell, 1980; Heinzelmann and Bagley, 1972).

In his book,Fitness After Fifty (1982), deVries writes that doctors and scientists are just beginning to explore the complex relationship between body and mind. Research has already shown that the mind acts on the body in countless subtle ways. deVries continues by saying that preliminary studies of the impact of exercise on

energy reserves and on people under stress suggest the link between body and mind may work in both directions and that activity of the body can affect the states of the mind.

Exercise has long been believed to relieve neuromuscular tension. Dr. Paul Dudley White who was a prominent example of vigorous physical activity said "exercise is the best tranquilizer in the world" (Brunner and Jokl, 1970). According to psychologist Richard Driscoll (1975) it is evident that physical activity enhances an individual's capacity to reduce stress. Wiswell (1980) believes that a major benefit of exercise and relaxation with regard to mental health is the potential ability of these interventions to assist older individuals in coping with stress, either physical or emotional. The manner in which exercise and relaxation reduce the detrimental effects of stress is not clearly understood. He states "It is possible that the ability of individuals to cognitively control their perception of exertional or emotional stress is the link tying aerobic exercise and relaxation responses together as a contributor to positive mental health. Exercise and relaxation may be the mediators of a central control mechanism to reduce the psychological impact of stress and

to further keep the body in metabolic balance" (p. 953).

During the stress response the body releases chemicals that pre-dispose toward disease or exacerbate certain chronic illnesses (Lewis, 1985). Exercises can retard the release of these chemicals and speed the metabolism of those already in the body (Allen and Hyde, 1981).

Bernath and his associates (1985) state that there is a wealth of information concerning the effect of exercise on the endocrine system, and they agree that for those individuals who trained the most and achieved improved fitness levels, favorable changes in mood, body image and psychological outlook do occur. What exact influences the endocrine system plays in these psychological changes remains speculative.

Bahrke and Morgan (1978) point out that exercise may be a useful stress coping mechanism for some people simply as "time out" therapy. The physical separation plus pleasant surroundings, an enthusiastic exercise leader, and sympathetic co-exercisers may be all that is required to decrease anxiety or depression: the actual exercise and its biologic effects may be secondary.

One important psychological benefit of exercise is an improvement in self-esteem. Exercise provides a sense of

accomplishment while it improves our health and our body's ability to function. The result of all this is that we feel better about ourselves. When we hold ourselves in high regard, we are less apt to be made ill or to feel badly from a stressor. Exercise can therefore provide psychological relief and help us manage stress (Greenberg, 1983).

According to Beck (1979), organisms are motivated to reduce aversive internal states. If one can consider fear and depression as aversion, than it seems quite plausible that older adults who exhibit this cognitive orientation would be more motivated to participate in exercise groups (Valliant and Asu, 1985). They hypothesized that pronounced cognitive and physiological differences separated physically active from nonactive people, and that cognition is instrumental in ability to cope with the aging process. They hypothesized that when the elderly experience less activity, they will actively seek out ways to reduce associated negative perceptions such as depression, fear, or lowered self-esteem. Using men and women 50 years and older who volunteered for an exercise program , they found that upon completion of the program, participants had lower depression scores and for the men increased self-esteem, compared to those who had

participated in social activities only.

Individual personality differences are singled out by Neugarten (1977) as the key element in the process of adaptation. Kuypers (1972) maintains that each individual possesses certain "disposing characteristics" which serve to pattern his interaction with the environment. When an individual experiences sequences of failure or success his self-concept is influenced. Positively experienced consequences lead to the feeling of being causally important, which in turn leads to the active creation of more positive consequences.

Stress and Chronic Disease

Pelletier (1977) says "psychosocial stress in our culture has become a dangerously cumulative phenomenon, unremitting in its effects. One tragic consequence of this is that stress-related psychological and physiological disorders have become the number one social and health problem in the last decade. Stress-induced disorders have long since replaced epidemics of infectious disease as the major medical problem of the post-industrial nation" (p.6). Described as the affliction of civilization, these chronic, degenerative diseases: cardiovascular disorders, cancer, stroke, arthritis,

diabetes and respiratory diseases are the most prominent in the U.S., Western Europe, and Japan (Fries and Crapo, 1981). Butler (1975) points out that 86% of the older population suffers from at least one chronic degenerative disease. 80% of all premature deaths and over 90% of all disabilities are due to chronic disease (Fries and Crapo, 1981). Prevention is the only sensible approach to the control of today's major health problems and exercise does play a role in this prevention (Morgan and Goldston, 1987).

The epidemic proportion of degenerative disease to a large extent is due to an individual's personal health habits and lifestyle choices. Harmful habits and choices include; smoking, improper diet (which in the U.S. frequently consists of excessive sugar, salt, fats, and alcohol intake), excesssive body weight, inadequate exercise, inadequate use of mature psychological defense mechanisms, and living in the psychological state of helplessness without options for major life choices and decisions (Fries and Crapo, 1981). The U.S. Public Health Service for the Center for Disease Control has estimated that one half the mortality for the ten leading causes of death in the United States is strongly related to habitual behaviors. Reports by the Surgeon General (1979) and the

Institute of Medicine (Hamburg, 1982) include physical inactivity among major health risk behaviors (Morgan and Goldston, 1987).

Processes that lead to chronic disease, not just the treatment of symptoms, should be emphasized by the health care system (MacRae, 1986). The assumption of personal responsibility for health with the emphasis on prevention of illness and promotion of health shows the greatest potential for reducing premature deaths and avoiding disabilities.

Fries and Crapo (1981) maintain the erroneous assumption has been made by medical science and services that the "body can be regarded as a machine whose protection from disease and its effects depends primarily on internal intervention. This approach has led to indifference to the external influences and behavior which are predominant determinants of health" (p.105).

Lazarus (1980) has identified two functions of psychosocial coping: instrumental or problem-solving and palliative or the regulation of emotional distress. Often, though not always, each coping mode supports the other. Effective copers use a combination of direct action and palliative coping strategies in dealing with stressful life situations (Reker, 1987).

Wellness Concept

The most promising technique in which palliative and instrumental coping are mutually supportive involves the mobilization of the individual's personal resources to achieve high levels of psychological and physical well-being. This is the wellness concept of health. Implicit in the wellness concept is the assertion that the individual has the responsibility and the power to take control of his or her health. (Reker, 1987).

Ryan and Travis (1981) believe that high-leval wellness is achieved through an assessment of self-responsibility, taking care of the physical self, using the mind constructively, and channeling stressors positively. The individual in a group environment is guided to marshal personal coping resources in four main areas: (1)stress control, (2) self-responsibility, (3)nutrition, and (4)physical fitness. Since the focus is on the individual and on self-maintenance, the wellness concept has the potential for promoting higher levels of perceived psychological and physical well-being.

Ideally, health promotion programs should be integrated and should include components such as nutrition, exercise, stress management, health monitoring

or medical self-care, and environmental awareness and action. Such programs speak to the individual in his or her wholeness as an integrated body, mind, and spirit (Warner-Reitz and Mettler, 1983). Edinburg (1985) feels that given the nature of problems faced by the elderly a "wellness" approach that emphasizes building on existing strengths, adaptation, and coping mechanisms should be considered rather than the traditional "illness" approach. According to Bolton (1985), many factors combine to support a wellness lifestyle model. He says "as health care costs continue an upward spiral to unprecedented levels; as physical fitness and health promotion become stronger factors in activities of daily living; and as the field of medicine discovers that aging is not a disease but a process responsive to proactive preparations, Americans will discover that the autumn of life can be far more pleasant and rewarding if they focus on sustaining and improving rather than passively waiting for Winter's inevitable chill" (p. 187). MacRae (1986) describes two paths that can be taken in discussing health care systems, a hard and a soft path. The hard path advocates the growth of medical-industrial complexes while the soft path encourages the holistic approach to health promotion in an attempt to prevent disease, or, in the case of existing

disease, to provide caring and coping strategies for the individual. The soft path is education-oriented with the emphasis on individual responsibility for health. As medical costs continue to increase this alternative soft path will become increasingly used.

Physical Activity and Mental Health

In an attempt to summarize what was known about exercise and its efficacy in the prevention and treatment of mental health problems, a state of the art workshop sponsored by the Office of Prevention of the National Institute of Mental Health, was held for health professionals in the Spring of 1984. Exercise and Mental Health (1987) resulted from this workshop. In Chapter 4, "Developing an Activity Plan for Improving Health", Haskell states that a wide variety of health and performance benefits have been attributed to the adoption of a physically active lifestyle. These benefits include both improvements in physical and psychological health status as well as enhanced physical and mental performance. Haskell warns however that "whereas a cause and effect relationship has been established between exercise and certain of these benefits, other potential benefits are supported only by associative or anecdotal data" (p.37)

Haskell (1987) continues that of the major claims for health, those with the greatest scientific basis are the contributions of exercise to maintenance of optimal body weight or composition, and the normalization of fat and carbohydrate metabolism. Other benefits that have been reported include maintenace of bone mineral content with aging, the prevention or alleviation of low back syndrome, the prevention of coronary heart disease, reduction of elevated systemic arterial blood pressure, and enhanced psychological status, including improved self-image and confidence, and decreased anxiety, depression, and hostility.

A caveat Haskell adds concerns the required stimuli that are required for the various psychological benefits ascribed to exercise to take place. Effects can be ascribed to changes in biology resulting from the exercise itself, from behavior due to the interaction between the exerciser and the exercising situation, or may result from some combined biobehavioral factors. The question of some psychological effects requiring a sympathetic nervous system activity, while others may depend on a behavioral stimulus such as physical separation from the stress producing situation or interaction with an exercise leader or other exercisers, remain unanswered. Haskell concludes

from the little that seems to be known, there "may be multiple stimuli, some behavioral and some biological"(p.40).

Wiswell (1980) suggests that "if exercise has a positive effect on improving physical health, these changes may result in improved mental health" (p. 953). He adds however that the role of physical activity on the maintenance of mental health status in normal individuals or its therapeutic effects as a treatment in individuals with altered mental health is not well understood. While it is generally accepted that exercise (used in the broad sense to incorporate several types of activities, such as various relaxation techniques, as well as jogging and calisthenics) is beneficial to emotional well-being, the existing scientific evidence is at best contradictory and incomplete. Although a physiological model which might explain the possible mechanism of benefit has yet to be postulated, it is reasonable to assume any of the following physical adaptations to regular exercise may prove beneficial to mental function.

1. Improved cerebrovascular circulation (brought about by regular endurance-type exercises).

2. Increased neuroendocrine sensitivity and function (brought about most likely by endurance-type exercise as

well as biofeedback and relaxation strategies).

3. A change of emotionality (as a result of changes in body image and/or access to a more positive psychosocial stimuli).

Morgan (1981) summarizes the literature dealing with the influence of exercise on personality and states "theoretical, correlational, epidemiologic, and experimental literature suggests that exercise, both acute and chronic, is associated with an improved psychological state" (p.311). The assumption in most of the experimental research is that exercise was responsible for, or caused, the observed changes. Morgan warns that even if the research had been conducted with acceptable designs instead of the quasi-experimental way it had been, it would still remain rather difficult to address the question of "Why exercise improves affect". Morgan feels the answer will be found at a "biochemical and neurophysiological level" (p. 311).

Ostrow (1984) in Physical Activity and the Older Adult, comments that even less is known about the impact of physical activity participation on the mental health of the older adult than on children and young adults. Anecdotal evidence leads to the belief that participation in physical activity provides similar personality and emotional benefits that have been

acclaimed for younger populations. Unfortunately Ostrow adds, the scientific evidence documenting this impact is at best, incomplete. According to Morgan(1981) research involving psychological benefits of exercise in elderly is almost non-existant.

Wantz (1981) states that long-term benefits of fitness include: (1) reduced risk of developing hypokinetic diseases such as diabetes, ulcer, low back pain, and emotional difficulties. Hypokinetic diseases are any physical or mental derangements induced by inactivity (Kraus, 1965, 1961). (2) Psychosocial problems are reduced. People who exercise regularly appear to have reduced tension, improved general learning potential for a given intelligence level, positive self-concepts, and are more confident, more self-sufficient, and more controlled.

Thirty years of research on the subjective well-being of older Americans reveals that good health is the most important contributor to positive feelings of general well-being (Larson,1978). Intricately related to feelings of well-being is the self-concept of elder adults: their estimates of self-pride,confidence, worth, and self-esteem. If feelings of well-being and good health are linked, and if good health can be shown to be a function of leading a physically active life-style, then one can logically deduce that physical activity is

beneficial to the well-being of older adults (Ostrow, 1984).

Busse and Blazer (1980) believe that exercise can be a useful therapeutic modality in geriatric patients with physical, mental, or mixed problems. Harris (1975) says that in addition to the physiological benefits of exercise, activity can improve motivation, independence, and self-image:provide new interests, abilities, and goals: and relieve psychological tension.

The National Council on Aging (1986) explains that changes and losses that happen to older people can cause profound stress. Non-competitive exercise that provides an outlet for physical tension and the buildup of stress hormones can lower stress. Older adults who exercise regularly report better coping skills and stress tolerance, higher energy levels, relief from minor depression and increased self-confidence.

Kermis (1985) writes that for persons of any age physical fitness improves circulation and respiration, diminishes stress, helps preserve a sense of balance, promotes body flexibility, and induces better sleeping patterns. Additionally Kermis feels that regardless of previous history of physical conditioning in older people, a program of vigorous physical exercise is beneficial. She states that the "type of decreased human performance that is caused by disuse may in fact

be the only sort of age-associated deterioration in which intervention can be truly effective" (p.124).

According to Lewis (1985), it should not be surprising that substantial physical and psychological improvements occur in chronically sedentary individuals who begin programs of moderate exercise. Experience with the dramatic effects induced by bed rest in young healthy subjects highlight the incapacitating effect of extended inactivity. A decrease in maximal work capacity as much as 30% has been demonstrated with three weeks of bed rest and this effect is most dramatic in those who are initially more sedentary (Saltin, 1968). It is easy to project that as one gravitates toward greater degrees of inactivity in later years, a vicious cycle often results from which it is difficult to escape and which causes far too many senior citizens from realizing their full physical potential. Participation in exercise programs on the other hand seems to have the opposite effect in the elderly resulting in an increase in other activities (Clark et al, 1975; Sidney and Shephard, 1977). In addition to improving the body's ability to fight both stress and depression, exercise, if conducted in a group setting, can provide an opportunity for socializing. Such interaction Lewis feels is too often missing in the day-to-day life of the elderly.

Butler (1983) writes that "physical exercise is often antidepressive" (p.368). Whitehouse (1977) maintains that the psychological benefits to the older adult of achieving physical fitness include the release of tension and aggression, and increased feeling of pride, confidence, and self-discipline. In studies to determine which factors are associated with successful aging, group activity and physical activity were the two strongest contributing factors (Palmore,1979,1965). Palmore observed that greater physical activity contributed directly to improved physical health and thereby indirectly to mental health and feelings of well-being among the elderly.

Van Zandt and Lorenzen (1985) claim that positive personality changes have been found in people who have begun a regular exercise program. They theorize that changes are due to the relationship between body and mind, such as increased circulation. Personality changes resulting from regular exercise may also come from the feelings of accomplishment, independence, and sense of control that accompany the discipline of a regular exercise program.

Nicholas (1977) proposes that regular physical activity in addition to enhancing the older adult's body image, also serves as a release for aggression and tension. Furthermore, Nicholas feels that physically

active older people are socially more acceptable.

Physical training has been shown to improve functional capacity and modify the cardiovascular risk factors and metabolic and psychological changes that accompany a sedentary life-style. A sense of depression and isolation, which often accompany reduced mobility in the elderly, may be averted or offset by increased functional ability resulting from exercise training. He adds that exercise is also associated with improved feelings of well-being and self-esteem and reduced anxiety.

In a study conducted by Millar (1987), tension, anger, depression, and fatigue had decreased after a three month exercise program with older people.

Cheraskin and Ringer (1973) report that Cornell Medical Index scores on the part of the questionnaire pertaining to psychological health, were lower for those older people who were taking regular daily exercise than in subjects who were inactive.

Studies examining personality trait change as a result of exercise were conducted among elderly subjects by Buccola and Stone (1975), The psychological effects of participation in a 14-week (3 days/week) jogging or cycling program for men aged 60-79, yielded

statistically significant improvements on the personality traits of surgency and self-sufficiency among those who elected the jogging treatment. The cycling group did not evidence any personality change. The generalizability of the results are questionable however when one asks if personality traits could be expected to occur after each participant averaged only 114 minutes a week of the physical activity.

In a study designed to examine the effect of exercise on depression, Bennet, Carmack, and Gardner (1982) conducted an exercise program for 38 elderly subjects. These individuals were either residents of a nursing home or participants at a drop-in community senior center. The results of the study led the authors to conclude that a program of balance and flexibility exercises was effective in reducing depression among those individuals initially classified as showing signs of clinical depression.

Morgan et al. (1970) conducted a daily exercise routine of walking and stretching with elderly individuals and concluded that most individuals middle aged and older who participate in regular exercise programs experience an improved feeling of well-being. This perception is associated with decrements in anxiety and depression.

Greist and his associates (1978) demonstrated that vigorous exercise(jogging) was superior to one form of psychotherapy and equal to a second in its anti-depressant action. His research is significant for several reasons. First, rather than comparing exercise with nothing (a control group) a comparison was made with traditional forms of psychotherapy. The second was the economy noted considering the time and money required for psychotherapy, and third, all but one of the patients in the running group were free of depressive symptoms at 12 months followup. Greist(1987) commented that it now seems likely that exercise has mood -elevating properties for many individuals with clinical depression. Antidepressant exercise needs to be done regularly and for most individuals, three sessions per week is a minimum with more sessions usually advantageous. Greist (1987) writes " each individual has a pattern of genetic, developmental, environmental, social, psychological and physiological characteristics that combine to permit or protect against depression at any point in time. How exercise interferes with or contributes to the development of depression remains an intriguing question. While a good start has been made in finding answers to questions about exercise and mental disorders, a great deal of

work remains to be done on indications for exercise treatment, effective elements in exercise therapies, prescription variables (frequency, duration and intensity), combination of exercise with other treatments, techniques to improve adherence, and mechanisms underlying effectiveness" (p.121).

Shisslak and Utic (1984) point out that although physical activity, and particularly running, has been cited as effective agents in reducing dysphoria among young and middle-aged individuals, it is difficult to know the effect exercise has on depression in geriatric populations since running is often too vigorous a physical activity for elderly individuals.

The impact of physical activity and exercise on tension and anxiety among older people has also been examined. Sidney and Shephard (1976) found statistically significant but modest overall declines in manifest anxiety in elderly subjects who trained the hardest and and improved their fitness level. Those same individuals reported a greater regard for activity as the "relief of tension."

In an earlier study, deVries and Adams (1972) contrasted the effect of the tranquilizing drug meprobamate to walking among 10individuals aged 52-70. The investigators reported that 15 minutes of walking at

a heart rate of 100 beats/minute was sufficient to induce muscular relaxation that lasted for at least one hour following exercise. The investigators maintained that in a single dose, exercise had a significantly greater tranquilizing effect on the musculature, without any undesirable effects, than did meprobamate. Subsequently deVries (1981) summarized this line of research and said that in the last ten years,five different studies on young, middle-aged, and older men and women showed that appropriate exercise had been able to improve the ability to relax both immediately and over a sustained period (p.57).

In 1982 deVries wrote that "exercise works wonders for mind as well as body. Participants in our program and others like it report more energy, less tension, more restful sleep, and fewer feelings of depression and anxiety" (p.11).

A study of elderly women 65-90 who were exposed to an exercise program of 10 sessions was carried out by Reiter (1981). A control group participated in an alternate program of activities such as arts and crafts but did not exercise. Mood states of the participants were assessed via the Spielberger state-trait anxiety inventory. Significant changes in mood and reduction in state anxiety occurred in the exercise group but not in

the control group. A self-rating scale of well-being increased for the exercise participants only, along with indications of better sleep patterns and increased body awareness.

Sidney and Shephard (1976) point out that "it seems both normal and abnormal aging populations respond favorably to programs of physical activity. However it is less certain whether the changes of psychological state reflect gains of fitness, or whether they result from other program factors such as subject-investigator interactions or patient-patient (camaraderie) interactions" (p.27).

Although the actual mechanisms underlying exercise effects such as the role of rhythmicity, proprioception, temperature changes, biogenic amines, endorphins, time-out, self-efficacy/ mastery, and other life-style factors are listed among the consensus statements that future research needs to determine, Morgan and Goldston (1987) list a number of consensus statements relating to what is known from research about exercise and mental health.

1. Physical fitness is positively associated with mental health and well-being.

2. Exercise is associated with the reduction of stress emotions such as state anxiety.

3. Anxiety and depression are common symptoms of failure to cope with mental stress, and exercise has been associated with a decreased level of mild to moderate depression and anxiety.

4. Appropriate exercise results in reductions in various stress indices such as neuromuscular tension, resting heart rate, and some stress hormones.

5. Current clinical opinion holds that exercise has beneficial emotional effects across all ages and in both sexes.

The purpose of this study is to assess the level of depression using two self-report measures: Geriatric Depression Scale (GDS); and the Profile of Mood States, depression scale (POMS-depression), in a Wellness Program sample of women 65 and older who take part in twelve weeks of exercise as part of Project Age-Well. The same measures will be used to assess depression in a control group of women 65 and older who do not exercise but are involved in group socialization activities.

Self-esteem in both groups will be assessed using Rosenberg's self-esteem scale (Self-esteem) and locus of control using Rotter's internal-external locus of control scale (I-E scale). These measures will be given to both groups before the exercise program starts and repeated in both groups twelve weeks later.

It is hypothesized that:

1) A Wellness Program sample of women 65 and older who take part in twelve weeks of exercise will have significantly lower depression scores after the exercise program than the control group.

2) A Wellness Program sample of women 65 and older who take part in twelve weeks of exercise will have significantly higher self-esteem scores after the exercise program than the control group.

3) A Wellness Program sample of women 65 and older who take part in twelve weeks of exercise will have a significant increase in internal locus of control orientation than a control group of women.

CHAPTER 3

METHOD

Subjects

The sample used for this study were female members of Amphi Community Education Seniors (ACES), a Senior Citizens' club in Tucson, Arizona. ACES is a social club for men and women, 55 years and older, who reside in the Amphi School District.

The experimental group consisted of ten female members of ACES who had signed up for an exercise class as part of the Project Age-Well Program. The women, all white, ranged from 65 to 80 with a mean age of 74.8 years. Three were married, four were widowed, and three were divorced.

Project Age-Well is a community health promotion program designed for people over 60 that is carried out by a team from the University of Arizona, Department of Family and Community Medicine. This multi-faceted program includes a medical assessment, various medical tests, and classes and lectures in stress management, nutrition, medications, and exercise, especially as these topics relate to older people and the normal aging process. Project Age-Well activities were offered to

all ACES members free of charge.

The exercise class was held three mornings a week at the ACES meeting site for approximately an hour. The classes which were conducted by the exercise physiologist on the Age-Well staff, consisted of stretching exercises chosen to maintain and increase a normal range of motion. Strengthening exercises for the large muscle groups of the body were also included. Talks by the exercise physiologist were given on the following topics: characteristics of a fitness program, fitness program goals, cardiovascular fitness, heartrate measurement, target heartrate, exercise and weight control, risks of physical activity, and hypertension and exercise. During the first two months of the program, each exercise participant was stress tested on a bicycle ergometer to determine her maximum exercise heartrate. A walking program was instituted following the stress test. Each participant was encouraged to walk for 20 minutes at 40% of her maximum heartrate. The goal of this part of the program was directed at increasing the cardiovascular fitness of each exercise participant.

The research questionnaire (Appendix A) was administered to the exercise group on the second meeting of the exercise class. No explanation was given by the

researcher except what is printed on the questionnaire.

The control group consisted of seven female members of ACES who met for card games and socialization twice a week at the ACES meeting site and who agreed to complete the questionnaire. The range of ages in the control group was 65 to 80 with a mean age of 73.5 years. Three in the control group were married, two were widowed and two were divorced. All were white.

Three months after the exercise class began, the same research questionnaire was given to each group.

MEASURES

Depression

The Geriatric Depression Scale (GDS) was one measure used to assess the level of depression in the sample. The GDS is a self-rating scale consisting of 30 yes/no questions. A score of 0-10 is the normal range, 11-20 indicates mild depression, and 21-30 equates with moderate to severe depression. This scale was specifically devised to assess depression in a geriatric population by Brink, Yesavage, Lum, Heersema, Adey, and Rose (1982). Although numerous self-rating depression scales have been devised, all have been designed to

assess depression in younger people and have not been standardized nor validated with a geriatric population. Unique characteristics pertaining to the aged and depression were addressed in the development of the GDS.

Somatic symptoms that are usually a key to the diagnosis of depression in the young are of less diagnostic significance in the elderly. Sleep disturbances for example are a common symptom of depression, but such disturbances are also common in nondepressed elderly individuals (Coleman et al., 1981).

Another problem in the assessment of geriatric depression is that elderly individuals are typically more resistant to psychiatric evaluation than are younger patients (Salzman and Shader, 1978; Wells, 1979). Questions that may be appropriate for a younger person, for example those about sexuality interests, may cause defensiveness in an older person. Other questions about whether life is worth living or if one is hopeful about the future, can be interpreted differently in an older person near the end of the life span (Blumenthal, 1975).

A third problem is the confusion of dementia with depression in the elderly. Furthermore, depression in

an older person is often accompanied by subjective experiences of memory loss and cognitive impairment (Kahn, Zarit, Hilbert, and Niederehe, 1975).

The GDS was developed specifically for the elderly and items were selected based on appropriateness and performance within an aged population. A yes/no format is additionally desirable for easy comprehension and administration.

The authors of the GDS began with 100 yes/no statements selected by researchers and clinicians involved in geriatric psychiatry that were thought to have potential utility in distinguishing normals from depressives in an elderly population. These 100 items were administered in a self-rating form to 47 subjects, male and female, 55 years and older, both normal elderly living in the community or elderly persons hospitalized for depression. Each subject was scored 0-100 on the number of depressive answers. Each item was correlated with the total scores in order to identify those 30 items which were most highly correlated with the total score. The median correlation for these items was .675.

For reliability and validity studies, the shorter 30 item version of the GDS was used on two groups of geriatric subjects. The first group (n=40) consisted of normal community elders with no history of mental

illness. The second (n=50) were older subjects under treatment for depression. Several measures of internal consistency were computed. Chronbach's (1951) coefficient alpha was computed and found to be .94, suggesting a high degree of internal consistency. Using the split-half reliability coefficient (Nunnally, 1967), as an alternative index of internal consistency, .94 was again obtained. Test-retest reliability was also calculated by having 20 subjects complete the questionnaire, one week apart. A correlation of .85 was subsequently obtained. Using the Reliability Alpha model of SPSS, a reliability coefficient of .73 resulted for the pre-experiment exercise group and .88 for the control, non-exercise group. Validity studies showed that the GDS correlated with the Zung Self-Rating Scale (r=.82) and with the Hamilton Rating Scale for Depression (r=.82).

Sensitivity (correctly classifying depressives) and specificity (correctly classifying normals) was also found to be high in the GDS. Using the same groups as those used in the reliability and validity studies, a cutoff score of 11 on the GDS yielded an 84% sensitivity rate and a 98% specificity rate.

Brink, Yesavage, Lum, Heersema, Adey, and Rose (1982), noting the ease of administration and acceptance

by older people, conclude that the GDS appears to be a promising and simple screening instrument in the elderly. Chaisson-Stewart (1985) states that preliminary research with the GDS suggests good correlation with an interview and observation rating scale measure of depression (Hamilton Depression Rating Scale). Since the GDS requires only a yes or no response, it has some advantage over the 4-point ratings required on the Beck Depression Inventory. Weiss et al. (1986) comment "no depression scale contains all the criteria characteristics of depression in late life, but the GDS has more than any other" (p.215). The Profile of Mood States (POMS) is the second self-report measure of depression used in this study. McNair, Lorr, and Droppleman (1971) state "increasing attention to mood states and mood changes is reflected in the literature on the effects of brief psychotherapies, psychotropic medications and other drugs, sleep deprivation, emotional stimulation, and similar experimental operations. This interest and effort has accentuated the need for a rapid, economical method of identifying and assessing transient, fluctuating affective states" (p.5). The Profile of Mood States (POMS) was developed to meet this need.

POMS consists of a 65 5-point adjective rating

scales which identifies six mood or affective states: tension-anxiety; depression-dejection; anger-hostility; vigor-activity; fatigue-inertia; and confusion-bewilderment. These mood scales have proven a sensitive measure of the effects of various experimental manipulations upon normal subjects and other nonpsychiatric populations (McNair, Lorr, and Droppleman, 1971). POMS is recommended for research purposes for normal subjects 18 years and older who have had at least some high school education.

POMS instructions state that the respondents should answer how they have been feeling during the past week, including today, to the list of adjectives that describe feelings people have. Five spaces are provided for the respondent to fill in as modifyers: 0=not at all, 1=a little, 2=moderately, 3=quite a bit, 4=extremely. The purpose of the one week rating period is to emphasize a period long enough to depict the patients typical and persistent mood reactions, and sufficiently short to assess treatment effects. Only one scale, the depression-dejection scale is used in this study. Fifteen adjectives comprise the depression-dejection scale with a possible score range of 0 to 60.

Reliability tests for the POMS as indicated by the authors show internal consistency of the items measuring

the same factor to be .90 or above. For the 15 items measuring depression, an internal consistency of .95 was obtained in a study with 350 male psychiatric outpatients, and .95 in another study with 650 female psychiatric outpatients. Test-retest reliability for POMS was estimated by retesting 100 psychiatric outpatients who were involved in the replication study of POMS. Correlations between the POMS initial score and at pre-treatment provide a rough estimate of stability before treatment intervention. For the depression factor of POMS, a stability coefficient of .74 was established.

In the development of POMS, six factor analytic replications were conducted. The authors state that results were remarkably congruent for different patient and normal samples and for different rating time periods. An examination of the individual items defining each mood scale support the face or content validity of the factor scores. Predictive and construct validity of POMS have been supported by research studies in four different areas.

Norms for POMS were established in two different studies. One study consisted of 650 female psychiatric outpatients and 350 male psychiatric outpatients at Boston University Medical Center Psychiatry Clinic. This

sample consisted of only 22 females 60 years and older which represents only 3% of the total. Norms based on a college sample of 340 men and 515 women show a considerable difference in mood disturbance. POMS scores are plotted as T-scores so that a test score can be easily converted by referring to the norms chart. A depression score of 14 for the college norms is equivalent to a T-score of 50. With a standard deviation of 10, 95% of the college norms for the depression factor fall within the scores of 0 to 36. For the outpatient psychiatric female norms, a T-score of 50 is equivalent to a depressed score of 28, with 95% of the scores falling within a range of 0 to 60.

Crown & Marlow's (1960) measure of social desirability was found to have a negative correlation of -.36 with depression indicating the depressed mood score is relatively independent of what Wiggins (1964), has called role playing, an indication of defensiveness or lying.

Although POMS is not validated for an older population, the researcher used the instrument as an additional measure of depression. The ability of POMS to assess a change in mood which the researcher hypothesized could result from the intervention of exercise prompted its use.

Self-esteem

Rosenberg's (1966) Self-Esteem (Self-Esteem scale) was used in this study to assess self-esteem in the exercise and in the control group. The instrument consists of 10 statements reported along a 4 point continuum. Respondents answer with one of 4 options ranging from strongly agree to strongly disagree. Possible scores range from 10 to 40.

Rosenberg devised this scale as a measure of self-esteem for a study of high-school students. Breytspraak and George (1982) indicate a survey of gerontological literature reveals the two measures most frequently used to assess self-concept and/or self-esteem are the Tennessee Self-Concept Scale and the Rosenberg Self-Esteem Scale. These two scales represent the best of all measures because of the amount of work that has been done to establish their validity and reliability, including their use on older populations.

Atchley (1969; 1976) and his colleague (Cottrell and Atchley, 1969) used the scale in a survey of over 3,000 older adults which focused on adjustment to retirement. Kaplan and Pokorny (1969) used Rosenberg's scale to examine the relationship between age and self-attitude in 500 respondents ranging in age from under 30

to 60. 135 respondents in this study were over age 60. Ward (1977) administered the scale to 323 residents of Madison, Wisconsin, ranging in age from 60 to 92 years, as part of a study of attitudes toward the aged, age identification, and self-esteem.

Rosenberg (1965) reported a reproducibility coefficient of .92 and a scaleability coefficient of .72 in his sample. A test-retest correlation of .85 was obtained by Silber and Tippett (1965) for a group of college students tested at a two week interval. Ward (1977) reported an alpha measure of internal consistency of .74. Using the Reliability Alpha model of SPSS, a reliability coefficient of .85 was obtained for the pre-experiment exercise group in this study.

Validity tests by Silber and Tippett (1965) reported correlations with similar measures and with clinical ratings ranging from .65 to .83. These researchers also reported no correlation between Rosenberg's scale and stability of perceptual performance and stability of ratings of others, suggesting discriminate validity.

Brekytspraak and George (1982) state that from available research, the Rosenberg Self-Esteen scale appears to be a suitable measure usable on older samples. The ease of administration and its brevity

increase its attractiveness. High levels of self-esteem reported in some studies suggest the possible confounding influence of social desirability. Nonetheless, Breytspraak and George (1982) believe that the amount of work done with the Rosenberg Self-Esteem scale is impressive and the instrument appears to be a useful measure of global self-esteem.

Locus of Control

Rotter's (1966) Internal-External Locus of Control (I-E scale) was used in this study as a measure of coping and adaptation. Seven items from the shortened version of Rotter's original 23 item list were used. Scores can range from 7 to 28 with a higher number indicating greater internal locus of control.

Both psychologists and sociologists have recognized that the variables of adaptation and coping are valuable conceptual tools in understanding how persons deal with stresses and daily problems. The terms coping, adaptation, and defense are used to suggest the efforts of the individual at solving real life problems in the broadest sense (Kahana, E., Fairchild, and Kahana, B., 1982). Pearlin and Schooler (1978) have suggested that the study of adaptation may represent a useful point of convergence between disciplines for understanding the

functioning and well-being of older persons. Kahana, E., Fairchild, and Kahana, B., (1982) mention that very few measures available have been specifically designed for assessing adaptation in aged populations. Locus of control is one measure that is related to the adaptive process and while it should not be considered to be an adaptive or coping strategy per se, it is a critical determinant of an individual's coping response.

Rotter's theory is based on "a generalized expectancy for internal vs. external control of reinforcement". When a person perceives that events are contingent on his or her own behavior, his or her belief is in internal control. Conversely, when a person believes that he or she is not the master of his or her own destiny, his or her belief is in external control (1966). Among the aged, Kuypers (1972) has found the I-E scale to be correlated with coping (ego functioning), personality, and intellectual functioning. Palmore and Luikart (1972), and Fawcett, Stonner, and Zepelin (1976) found a correlation between the I-E scale and life satisfaction in older people. Wolk and Kurtz (1975) compared I-E scale scores between the aged and college students and found greater internal control among the aged than among college populations.

Rotter's tests of reliability and those of others

include internal consistency estimates (split-half, Spearman-Brown, and Kuder-Richardson) ranging from .65 to .79. Test-retest reliabilities range from .49 for a two month interval with males to .83 for a one month interval with females. Fawcett, Stonner, and Zepelin (1976) reported test-retest reliability of .76 in an elderly sample. Using the Reliability program of SPSS, a coefficient of .88 was obtained for the pre-experimental exercise group.

Robinson and Shaver (1973) have noted that even though some methodological difficulties remain to be resolved, the Rotter I-E scale is a valuable scale for measuring control expectancy.

CHAPTER 4

RESULTS

T-tests on pre-exercise scores for the dependent variables: GDS, POMS-depression, Self-Esteem, and I-E scale, were computed on the exercise and control groups in order to establish group equivalence. No significant differences were found and both groups are very similar. (Table 1).

Brink, Yesavage, Lum, Heersema, Adey, and Rose (1982), indicate a score of 0-10 for the GDS is normal. 11-20 is an indication of mild depression and 21-30 an indication of moderate to severe depression.

The range of scores for the exercise group were from 0 to 11 with a mean of 5.70 and a standard deviation of 3.86. Scores in the control group ranged from 0 to 18 with a mean of 6.00 and a standard deviation of 5.91. Since both of these mean scores are in the normal range as indicated by the GDS authors, this sample of women was not depressed and were very similar.

Pre-exercise scores assessed by the depression scale of POMS ranged from 0 to 20 in the exercise group with a mean of 8.40 and a standard deviation of 7.72. The

control group mean score was 9.42 with a standard deviation of 10.12. Scores ranged from 0 to 24. Examination of the data showed the participant in the exercise group with the most depressed GDS score of 20 had the second highest POMS depression score of 11. A similar reliability of measures occurred in the control group with a participant scoring 18 on the GDS and 21 on the POMS.

POMS depression scores can range from 0 to 60. Norms were established on 856 college students and were converted to standard T-scores. A raw score on the depression scale of 14 is equivalent to a T-score of 50. The mean score for the exercise group of 8.40 and the mean score for the control group of 9.43 are equivalent to a T-score of 44 and 45, respectively.

Self-esteem scores as rated by the Rosenberg self-esteem scale can range from 10 to 40. The exercise group mean pre-score for self-esteem was 34.70, indicating high self-esteem. The control group mean self-esteem score of 32.43 is also an indication of high self-esteem.

Rotter's I-E scale scores can range from 7 to 28, with a higher number indicating a more internal orientation. A mean score of 22.00 with a standard deviation of 5.50 in the exercise group and a mean score of 21.57 with a standard deviation of 1.81 indicate both

Table 1

Pre-exercise Means and Standard Deviations

Variable	Exercise Group (n=7)		Control Group (n=10)		
	X	SD	X	SD	t
GDS	5.70	3.86	6.00	5.91	-.12 (NS)
POMS-Dep.	8.40	7.72	9.42	10.72	-.22 (NS)
Self-Esteem	34.70	5.54	32.43	2.37	1.15 (NS)
I-E Scale	22.00	5.50	21.57	1.81	.23 (NS)

(NS) = Not Significant

groups in this sample had a high or internal locus of control orientation.

Pearson product-moment correlations were computed between the dependent variables: GDS, POMS-depression scale, self-esteem and the I-E scale for pre and post scores in both groups. (Tables 2-5).

Table 2, Correlations of Pre-exercise Scores in the Exercise Group, show a significant negative correlation between the GDS and self-esteem and locus of control. There is also a high significant positive correlation of .78 between self-esteem and locus of control which indicates these two variables share 60% of the same variance.

Table 3, Correlations of Post-exercise Scores in the Exercise Group, indicate a significant positive correlation between the two measures of depression and an increase to .87 in the correlation between self-esteem and locus of control. 75% of the variance in these two variables is shared.

Table 4, Correlations of Pre-exercise Scores in the Control Group, illustrate a significant positive correlation between the two measures of depression.

Table 5, Correlations of Post exercise Scores in Control Group, show a significant negative increase in both measures of depression to self-esteem.

Table 2

Correlations of Pre-exercise Scores in the Exercise Group

Variable . . .	1 GDS	2 POMS-depression	3 Self-Esteem	4 I-E scale
1. GDS	--			
2. POMS-depression	.19	--		
3. Self-esteem	-.75 **	-.01	--	
4. I-E Scale	-.56 *	-.01	.78 **	--

* p < .05
** p < .01

Table 3

Correlations of Post-exercise Scores in the Exercise Group

Variable . . .	1 GDS	2 POMS-depression	3 Self-Esteem	4 I-E scale
1. GDS	--			
2. POMS-depression	.73 **	--		
3. Self-esteem	-.56 *	-.13	--	
4. I-E Scale	-.76 **	-.45	.87 ***	--

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

Table 4

Correlations of Pre-exercise Scores in the Control Group

Variable . . .	1 GDS	2 POMS-depression	3 Self-Esteem	4 I-E scale
1. GDS	--			
2. POMS-depression	.70 *	--		
3. Self-esteem	-.45	-.13	--	
4. I-E Scale	-.01	-.29	-.18	--

* $p < .05$

Table 5

Correlations of Post-exercise Scores in the Control Group

Variable . . .	1 GDS	2 POMS-depression	3 Self-Esteem	4 I-E scale
1. GDS	--			
2. POMS-depression	.57	--		
3. Self-esteem	-.83 **	-.72 *	--	
4. I-E Scale	-.33 *	-.39	.34	--

* $p < .05$
** $p < .01$

To determine the significance of pre to post changes in mean scores for the dependent variables, t-tests were done for both groups (Table 6).

The changes in both measures of depression in the exercise group were significant at the .05 level. Pre-scores in the GDS dropped from 5.70 to 2.40, and in the POMS-depression scale, scores decreased from 8.40 to 4.20. Although depression scores decreased in both measures in the control group also, these changes did not reach a level of significance. These results support the hypothesis that the exercise group will have significantly lower depression scores after twelve weeks of exercise.

A t-value of -2.24 for the GDS change with a two-tailed probability of .052 was divided by 2 since the hypothesis predicted a change in one direction. A probability of .026 resulted. A t-value of -2.04 with a two-tailed probability of .072 when divided by two resulted in a significant probability of .036 for the change in the POMS-depression scores.

Although self-esteem and locus of control scores both increased as hypothesized in the exercise group, neither change was significant at the .05 level.

Pre to post mean score changes in the control group were also in the hypothesized direction. Self-esteem scores which increased from 32.43 to 35.29 were significant at the .05 level.

Table 6

Results of T-test for Significance of Pre- to Post- Changes

Variable	Pre-exercise $\bar{x}$ (Std.Dev.)	Post-exercise $\bar{x}$ (Std.Dev.)	T-value	One-tail Probability
Exercise Group (n=10)				
GDS	5.70 (3.86)	2.40 (2.40)	-2.24	.026*
POMS-Depression	8.40 (7.72)	4.20 (7.52)	-2.04	.036*
Self-Esteem	34.70 (5.54)	35.90 (3.81)	.60	.283
I-E Scale	22.00 (5.40)	22.90 (4.98)	.40	.349
Control Group (n=7)				
GDS	6.00 (5.91)	4.57 (6.08)	-1.70	.07
POMS-Depression	9.43 (10.72)	7.29 (11.01)	- .56	.296
Self-Esteem	32.43 (2.37)	35.29 (3.68)	2.46	.024*
I-E Score	21.57 (1.81)	22.57 (3.95)	.48	.324

* $p < .05$

CHAPTER 5

DISCUSSION

Data collected for this study on the effect of an exercise program on depression, self-esteem, and locus of control orientation in a group of older women, support the first study hypothesis, namely that:

1) A Wellness program sample of women 65 and older who take part in twelve weeks of exercise will have significantly lower depression scores after the exercise program than a control group of women who do not exercise. These results agree with the studies of Millar (1987), Valliant and Asu (1985), Perri and Templar (1984-85), Bennett et al. (1982), and Reiter (1981) which all show psychological benefits associated with exercise programs for older adults.

That exercise is associated with a decreased level of mild to moderate depression agrees with one of the consensus of research statements made by Goldston and Morgan (1987) about exercise and mental health. These authors state that depression is a common symptom resulting from the failure to cope with mental stress.

It is important first of all to note that even though exercise is associated with a decrease in depression, the actual mechanism or how exercise decreases depression, is not known. In the case of mental stress, the mechanism may be simply a "time-out" therapy. Bahrke and Morgan (1978) point out that the physical separation, plus pleasant surroundings, an interested and enthusiastic exercise leader and the camaraderie of sympathetic fellow exercisers may be all that is required to decrease depression. The actual exercise and its biologic effects may be secondary.

Because depression is considered to be an affective, transitory feeling or mood, in contrast to a more stable enduring trait, it is amenable to change. The use of the POMS depression scale which was devised as a method of identifying and assessing such fluctuating affective states, show that exercise in this study was effective in reducing depression in the exercise group.

The conceptual basis for depression as a reaction to the threat of physical losses incurred through aging and disuse, is confounded by very low pre-exercise depression scores. Since a general level of perceived health was not collected, the researcher can only

surmise that the sample was not depressed because of aging related losses or for some other reason.

A number of design flaws are apparent in this quasi-experimental study. The use of a convenient, volunteer sample, threatens the external validiity of this study and limits the results to the sample population only. Although the heterogenity of older people is established (Atchley, 1985; Butler and Lewis, 1983), older people interested in physical activity are generally healthier and have better functional mobility.

The second and third hypotheses are not supported by the data. Again the characteristics of the sample and the failure to use domain-specific measures are design flaws. Lachman (1986) and Rodin (1978) state that domain-specific measures may be more appropriate for use with the aged than generalized measures. Differential age changes, especially those changes related to health and personal efficacy, are quite different for older people. Since Rotter's I-E scale is a one-dimensional construct, the use of a multi-dimensional measure such as Levenson's Internal, Chance, and Powerful others subscale (Levenson, 1973) would have been preferable. Two, more specific measures of

perceived control of health, are the Nowicki-Strickland Locus of Control scale (Nowicki and Strickland, 1973), and the Multiple Health Locus of Control (Wallston and Wallston, 1982).

Since the study hypothesis is aimed more at detecting a change in self-esteem as it relates to physical self-concept, the use of Rosenberg's scale which is a generalized measure of self-esteem was inappropriate. Whitbourne (1985) refers to the need for developing a questionnaire measure of physical self-esteem. Such a measure will be constructed as studies on the physical effects of aging as a person perceives them occurring personally, and the impact these changes have on their life and feelings of self-concept and competence, become increasingly popular. The Tennessee Self-Concept Scale which was used in the Perri and Templar (1984-85) study possibly taps into measuring body self-concept better than Rosenberg's scale.

This study was undertaken in order to show some of the psychological benefits of exercise for older people. Morgan's caveat to exercise advocates who may imply that physical activity is inherently capable of achieving results not possible by other means, is apparent when post-exercise scores for the sedentary control group

also improved. Morgan (1981) cites the study of Chien (1971) who found more psychological improvement took place in the group of hospitalized geriatric patients who received beer in a specially designed "pub" setting in the hospital where social interaction was encouraged with fellow patients, than the group who was administered the drug thioridazine, a popular and established psychotropic geriatric drug.

In this study the sedentary control group functions more as a placebo group. The importance of the group activities and the social interaction that takes place, is as effective in increasing self-esteem and locus of control as the exercise program.

Although depression has been cited as a substantial problem in the elderly (Frengley, 1987; Atchley, 1985; Butler and Lewis, 1983; Zarit,1984), age per se is not the critical determinant of depression. Feinson (1985) identifies the four factors of physical health: social support, organizational activities, and mobility, all of which may decline with advanced age, as major reasons for reactive depressive symptoms to occur in the elderly.

The women taking part in this study are all members of ACES, a very active social group for seniors.

Membership in this group provides a strong social support system which in turn supplies its members with important norms, identities, interests, and rewarding patterns of behavior. Organizational activities, a second factor cited by Feinson, are diversified and numerous for ACES' members. The mean age of the study cohort is 74, an age to which our present society accords a physically sedentary life-style. The activities of ACES are largely sitting and relatively inactive such as card playing, sewing, pot-lucks, and day trips. The male members play pool but that is the most vigorous activiy in the program. People compare themselves with their own age group and for successful membership in ACES, physical fitness is not important.

Physical health and mobility are the other two factors related to depression according to Feinson's analysis.

Since the sample was physically able to attend ACES' meetings, no obvious restrictive disabilities or chronic disease exists which limits their mobility and autonomy. Various degrees of aging related chronic disease undoubtedly effect these women but according to Stenback (1980), high self-esteem scores indicate these women have adapted to an altered self-image

psychologically and physically. The use of the GDS which does not refer to somatic causes for depression and which yielded scores in the normal range for both groups makes this observation tenable.

The use of a generalized measure of self-esteem and the failure to assess the body self-concept of this sample yields high self-esteem scores which agrees with the studies of Mangen and Peterson (1982), Kaplan and Pokorny (1970), Atchley (1969), and Gurin, Veroff, and Feld (1960) who found that self-esteem does not decrease with age.

According to Sonstroem (1984), society provides a wide variety of social identities and interests for people. For the women in the control group an increase in physical fitness was not important to their self-esteem and identity. Aiken (1982) explains that the sociocultural group to which an individual belongs is instrumental in self-evaluation. It is only conjecture but the control group could possibly expect to experience a decrease in flexibility or weight gain as inevitable with advancing years. Decreased function unfortunately is an accepted norm for many older people. Conrad (1976) suggests that older Americans believe their need for exercise diminishes and eventually

disappears as they grow older. They also tend to vastly exaggerate the risks involved in vigorous exercise after middle-age, overrate the benefits of light, sporadic exercise, and underrate their own physical abilities and capacities.

The importance of socialization patterns as determinants of behavior is another factor which partially explains the attitude this cohort has toward physical activity. This study sample grew up attending school when little emphasis was put on the health benefits of exercise. Scientific awareness of the vital role physical activity plays in preventing hypokinetic and chronic disease in later years was not known until the late 60's (Spirduso, 1980). Physical education classes in the early decades of this century were far different than today. The emphasis was on calisthenics and routinized activities. Classes were strictly gender based and frequently fostered the attitude that they must be endured rather than enjoyed or that any physical or psychological benefits might result. Life-styles had not become as sedentary when these women were young and health clubs and the emphasis on strong, slim bodies did not exist. Since educational background data was not collected, the level of educational attainment is

unknown. This age cohort has less formal education as a rule with less than half the women over 60 graduating from high school where most physical education classes would be taken. The more formal education a person has correlates with greater knowledge usually and this would include the current awareness of the importance of physical activity for older people.

The validity of self-reports and the confounding of social desirability with responses is a threat to the internal validity of this study. Although the GDS was designed and validated on an older population, the other tools used in this study were not and normative data does not exist for their use. Gallagher (1980) points out that test-taking problems and increasing variability of older people when responding, make many paper and pencil tests of questionable reliability and validity. The use of a pre-test which can potentially alert participants to intended treatment effects may also help account for the post scores in both groups to rise. Another contaminating threat to the internal validity and results of this study is the attitude of the participants toward being part of a study. The exercise group knew they were part of Project Age-Well which is a research oriented program. The control group could have

been influenced by the Hawthorne effect and subsequently wanted to look good, especially in comparison to their cohorts who had elected to take part in the free, available exercise program.

The high locus of control scores in both groups is an indication of the personal autonomy in this sample of older women. They are able to live independently and maintain personal control over their environment. These factors are all vital to the maintenance of self-esteem which in turn partially explains their low depression scores. Internality also agrees with Wolk and Kurtz (1975) findings that internals are more active and have better coping abilities and greater adaptability. Palmore and Luikart (1972) found that locus of control was the third strongest predictor of life satisfaction in the elderly with internality making a positive contribution to satisfaction. This sample of women appear to have these characteristics.

Although it was hypothesized that those taking part in exercise would increase in internality as an indication of their desire to take control of their aging body, the research of Timko, Harris, and Rodin (1985) points out that people differ in their desire for control. It can be speculated that the control group

had no desire to improve their level of physical fitness and little desire to invest the time and energy in an endeavor they perceived as unimportant and possibly unattainable.

An indication of the validity of the conceptual basis of this study is shown when the individual scores of exercise participants are examined. Two women in the exercise group had decreased depression scores and increased self-esteem and internal locus of control scores after the exercise program.

Participant X:

Variable	Pre-score	Post-score
GDS	23	0
POMS depression	6	1
Self-esteem	23	40
I-E scale	15	28

Participant Y:

Variable	Pre-score	Post-score
GDS	6	0
POMS depression	11	3
Self-esteem	36	40
I-E scale	16	28

According to W. P. Morgan (1981), research involving the psychological benefits of exercise for the elderly is almost non-existent. This research effort illustrates the many pitfalls of gerontological, psychological and behavioral medicine studies.

With the rapidly expanding gerontological population in the world today and the promise that the wellness concept of health offers both in physiological and psychological benefits to older people, Ostrow (1982) admonishes researchers that "the mutual evolution of research-based knowledge is vital if efforts toward promoting a more physically active older citizenry can be viewed as credible and worthwhile". (p.36)
A replication of this study is therefore recommended with the following refinements. A larger sample number of older people, randomly selected from both sexes, is imperative in order to provide external validity to the study and thereby extend the results to all older people. To decrease the threat of sensitization, the Solomon four group design is preferable. The collection and correlation of socioeconomic and educational background plus a personal history of past and present physical activities with the dependent variables would be informative. An assessment of pre to post

physiological changes in blood pressure readings, weight loss, flexibility measurements, and maximum heartrate would be objective measures to correlate with subjective psychological measures. The use of domain-specific measures would clarify the scores in order to better test the hypotheses concerning the effect of exercise on the psychological variables of depression, self-esteem, and locus of control.

Valid results from an improved study could help encourage physical activity in the lives of older adults affecting not only the quantity of years, but in improving the quality of those years.

APPENDIX A: RESEARCH QUESTIONNAIRE

We hope you will consent to participate in this study. Quite a bit is known about the physical benefits of the Age-Well program but the psychological benefits are not so well understood. Because this area has not been researched as much, the information you give will provide some needed data to learn more. Your participation in this study is completely voluntary. The completion of these questionnaires will require approximately 30 minutes of your time. There are no costs or risks and all the information you give will be kept confidential. You may refuse to answer any questions without incurring any ill will. In three months we will again ask you to complete a questionnaire. Any information used in locating participants will be destroyed at the conclusion of the study and no record will be kept of your participation. The success of this project depends upon your participation. We will provide you with a summary of the results of the study when completed. Your consent to participate in the study will be indicated by your completion of the questionnaire. If you have any questions please do not hesitate to ask or telephone me. Thank you for your help.

Virginia Knittle
Project Age-Well Volunteer
792-2063

Circle the answer which best describes how you feel.

1. Are you basically satisfied with your life?	Yes	No
2. Have you dropped many of your activities and interests?	Yes	No
3. Do you feel that your life is empty?	Yes	No
4. Do you often get bored?	Yes	No
5. Are you hopeful about the future?	Yes	No
6. Are you bothered by thoughts you can't get out of your head?	Yes	No
7. Are you in good spirits most of the time?	Yes	No
8. Are you afraid that something bad is going to happen to you?	Yes	No
9. Do you feel happy most of the time?	Yes	No
10. Do you often feel helpless?	Yes	No
11. Do you often get restless and fidgety?	Yes	No
12. Do you prefer to stay at home, rather than going out and doing new things?	Yes	No
13. Do you frequently worry about the future?	Yes	No
14. Do you feel you have more problems with memory than most?	Yes	No
15. Do you think it is wonderful to be alive now?	Yes	No

16. Do you often feel downhearted and blue? Yes No

17. Do you feel pretty worthless the way you are now? Yes No

18. Do you worry a lot about the past? Yes No

19. Do you find life very exciting? Yes No

20. Is it hard for you to get started on new projects? Yes No

21. Do you feel full of energy? Yes No

22. Do you feel that you situation is hopeless? Yes No

23. Do you think that most people are better off than you are? Yes No

24. Do you frequently get upset over little things? Yes No

25. Do you frequently feel like crying? Yes No

26. Do you have trouble concentrating? Yes No

27. Do you enjoy getting up in the morning? Yes No

28. Do you prefer to avoid social gatherings? Yes No

29. Is it easy for you to make decisions? Yes No

30. Is your mind as clear as it used to be? Yes No

Would you kindly answer the following questions by indicating whether you: "strongly agree" (SA) with the following statement; "mildly agree" (MA); "mildly disagree" (MD); or "strongly disagree (SD) with the statement.

SA = Strongly agree
MA = Mildly agree
MD = Mildly disagree
SD = Strongly disagree

	SA	MA	MD	SD
31. I feel that I'm a person of worth, at least on an equal basis with others.	—	—	—	—
32. I feel that I have a number of good qualities.	—	—	—	—
33. I am able to do things as well as most other people.	—	—	—	—
34. All in all, I'm inclined to feel that I'm a failure.	—	—	—	—
35. I feel I do not have much to be proud of.	—	—	—	—
36. I take a positive attitude toward myself.	—	—	—	—
37. On the whole, I am satisfied with myself.	—	—	—	—
38. I wish I could have more respect for myself.	—	—	—	—
39. I certainly feel useless at times.	—	—	—	—
40. At times, I think I am no good at all.	—	—	—	—

Please answer these questions in the same way.

SA = Strongly agree
MA = Mildly agree
MD = Mildly disagree
SD = Strongly disagree

	SA	MA	MD	SD
41. There is really no way I can solve some of the problems I have.	___	___	___	___
42. Sometimes I feel that I'm being pushed around in life.	___	___	___	___
43. I have little control over the things that happen to me.	___	___	___	___
44. I can do just about anything I really set my mind to.	___	___	___	___
45. What happens to me in the future mostly depends on me.	___	___	___	___
46. There is little I can do to change many of the important things in my life.	___	___	___	___
47. I often feel helpless in dealing with the problems of life.	___	___	___	___

DIRECTIONS: Fill the sheet out [redacted] in terms of HOW YOU HAVE BEEN FEELING DURING THE PAST WEEK INCLUDING TODAY. Remember to fill in only ONE space which best describes how you have been feeling THE PAST WEEK INCLUDING TODAY.

HOW YOU FELT PAST WEEK The numbers refer to these phrases. 0 = Not at all 1 = A little 2 = Moderately 3 = Quite a bit 4 = Extremely	NOT AT ALL	A LITTLE	MODERATELY	QUITE A BIT	EXTREMELY
2. Tense	0	1	2	3	4
3. Angry	0	1	2	3	4
4. Worn out	0	1	2	3	4
5. Unhappy	0	1	2	3	4
7. Lively	0	1	2	3	4
8. Confused	0	1	2	3	4
9. Sorry for things done	0	1	2	3	4
10. Shaky	0	1	2	3	4
11. Listless	0	1	2	3	4
12. Peeved	0	1	2	3	4
14. Sad	0	1	2	3	4
15. Active	0	1	2	3	4
16. On edge	0	1	2	3	4
17. Grouchy	0	1	2	3	4
18. Blue	0	1	2	3	4
19. Energetic	0	1	2	3	4
20. Panicky	0	1	2	3	4
21. Hopeless	0	1	2	3	4
22. Relaxed	0	1	2	3	4
23. Unworthy	0	1	2	3	4
24. Spiteful	0	1	2	3	4
26. Uneasy	0	1	2	3	4
27. Restless	0	1	2	3	4
28. Unable to concentrate	0	1	2	3	4
29. Fatigued	0	1	2	3	4
31. Annoyed	0	1	2	3	4
32. Discouraged	0	1	2	3	4
33. Resentful	0	1	2	3	4
34. Nervous	0	1	2	3	4
35. Lonely	0	1	2	3	4
36. Miserable	0	1	2	3	4
37. Muddled	0	1	2	3	4
38. Cheerful	0	1	2	3	4
39. Bitter	0	1	2	3	4
40. Exhausted	0	1	2	3	4
41. Anxious	0	1	2	3	4
42. Ready to fight	0	1	2	3	4
44. Gloomy	0	1	2	3	4
45. Desperate	0	1	2	3	4
46. Sluggish	0	1	2	3	4
47. Rebellious	0	1	2	3	4
48. Helpless	0	1	2	3	4
49. Weary	0	1	2	3	4
50. Bewildered	0	1	2	3	4
51. Alert	0	1	2	3	4
52. Deceived	0	1	2	3	4
53. Furious	0	1	2	3	4
54. Efficient	0	1	2	3	4
56. Full of pep	0	1	2	3	4
57. Bad-tempered	0	1	2	3	4
58. Worthless	0	1	2	3	4
59. Forgetful	0	1	2	3	4
60. Carefree	0	1	2	3	4
61. Terrified	0	1	2	3	4
62. Guilty	0	1	2	3	4
63. Vigorous	0	1	2	3	4
64. Uncertain about things	0	1	2	3	4
65. Bushed	0	1	2	3	4

MAKE SURE YOU HAVE ANSWERED EVERY ITEM.

THANK YOU!

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