The effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks in a group of female senior citizens
by Amanda Carolyn Cater

A thesis submitted in partial fulfillment of the requirement for the degree of Master of Science in Physical Education
Montana State University
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Abstract:
The purpose of this study was to determine the effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks of a group of senior citizens. The aspects of mental health examined were self-concept and general well-being. Self-concept in this study was composed of measures of self-esteem, self-image, and body image. Seventeen women ranging in age from 66-83 years participated in the study.

There were two phases in the study. A one-month socialization phase consisted of group discussions in which the emphasis was on getting acquainted. The second phase consisted of a ten-month exercise program. Participants volunteered for the socialization phase or the exercise phase or both.

Five instruments were used before and after each program to assess changes in the participants. The instruments used to assess changes in self-concept were Rosenberg's "Scale of Self-esteem" (1965), McPherson's "The Real Me" (1966), and Kenyon's "Attitudes Toward Physical Activity" (1968), the body image section only. Two instruments designed by the author for this study were used to determine changes in general well-being and the performance of daily tasks.

After the socialization phase, scores in body image improved, and there was less discrepancy between real and ideal body image scores. After the exercise program, scores improved in self-image, real body image, well-being, and daily task performance for the majority of the participants. Neither program had a positive effect on the scores of self-esteem. It should be noted that the changes in test scores did not reflect the positive verbal comments made by the participants at the end of the program.
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IN A GROUP OF FEMALE SENIOR CITIZENS

by

AMANDA CAROLYN CATER

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APPROVAL

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Amanda Carolyn Cater

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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ABSTRACT

The purpose of this study was to determine the effect of a regular exercise program on selected aspects of mental health and on the performance of daily tasks of a group of senior citizens. The aspects of mental health examined were self-concept and general well-being. Self-concept in this study was composed of measures of self-esteem, self-image, and body image. Seventeen women ranging in age from 66-83 years participated in the study.

There were two phases in the study. A one-month socialization phase consisted of group discussions in which the emphasis was on getting acquainted. The second phase consisted of a ten-month exercise program. Participants volunteered for the socialization phase or the exercise phase or both.

Five instruments were used before and after each program to assess changes in the participants. The instruments used to assess changes in self-concept were Rosenberg's "Scale of Self-esteem" (1965), McPherson's "The Real Me" (1966), and Kenyon's "Attitudes Toward Physical Activity" (1968), the body image section only. Two instruments designed by the author for this study were used to determine changes in general well-being and the performance of daily tasks.

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CHAPTER 1

INTRODUCTION

At the turn of the century, a small percentage of the United States population was over the age of 65. It is estimated that by the end of the 20th century, almost 19 percent of our population will be senior citizens (1980 census, U.S. Department of Agriculture). The growing number of older adults presents our society, and particularly the health care agencies, with some unique problems.

Men and women over 65 years of age are responsible for one-third of the nation's overall health costs and one-third of the family physician's total practice time. Older adults spend twice the number of days in the hospital and account for 3.5 times the health care costs of other age groups (Goodstein, 1981). With rising costs and increasing numbers of claimants, it is estimated that by 1991, Medicare will not have adequate funds to meet the demands of the aging population. A major dilemma for health care providers is how to provide quality health care at minimal cost and how to promote effective health care programs for the rapidly-increasing group of senior citizens. As health care costs increase, the expense of caring for our elderly becomes troublesome for individuals, families, and society.

As a preventive health measure and to improve the quality of life, many older adults are adopting a more active lifestyle. Senior citizens have joined the rising number of joggers, swimmers, and cyclists in
America's current fitness movement. Active older adults report feeling better and having increased stamina as a result of this change in lifestyle.

Researchers have been interested in the physiological effects of exercise on the older adult. Degenerative aspects of aging, such as poor circulation, stiff joints, and lack of energy, can be retarded by regular exercise (Smith, 1978; deVries, 1979). Work capacity can be increased in people aged 65-70 years by a conditioning program (Barry, 1966). Older participants in some studies have reported that in addition to the physiological gains, they also have experienced psychological improvements evidenced by better moods, a better appetite, more vitality, and a general feeling of well-being (Morgan, 1979). These improvements imply that a relationship may exist between participation in conditioning programs and certain aspects of mental health.

Overall health is related both to physical and mental condition and is reflected in the ability to cope with day-to-day living. The quality of life for many elderly individuals depends somewhat on their maintaining the ability to take care of their homes and themselves. Often decreased physical stamina or mental depression, or both, reduce the capacity to keep house and carry out shopping duties. Investigators have suggested that the day-to-day functioning of an elderly person is partially related to mental health (Lawton, 1975; Wolinsky, 1984). For some older people, exercise programs may be a form of insurance against the long-term institutional care currently required by five percent of our senior citizens.
A review of the literature raised questions in the mind of the investigator about the relationships among exercise, mental health and the process of aging. If senior citizens were more active, would they be better able to take care of themselves? Would the tasks of daily living be easier to accomplish? Would they feel better about their bodies? If they had more vitality as a result of exercise, would they be happier? Would they be less lonely or bored? Can an intervention such as an exercise program make a difference in self-esteem? This study was designed to investigate these types of questions and to provide some baseline information about the use of exercise programs as a preventive health measure with older adults.

The Theoretical Framework

Studies have indicated that the quality of life for the elderly depends on many factors such as health, dwelling place and financial security. Health is a major concern of the individual, and for agencies providing health care services. A person's health is composed of physical, mental, emotional and spiritual aspects, all of which are interrelated. Gerontologists have been interested in the relationships among biological, physiological, and psychological aspects of aging (Smith, 1978; Schaie, 1981; Poon, 1980). Psychologists have studied components of life satisfaction, morale, and self-concept in the elderly. Researchers in physical health have investigated the effects of exercise programs and nutritional modifications on the aging body.
Some of the previous research has been useful in designing programs to provide help to aging individuals and to improve the quality of their life. However, much of the research has focused on the physical aspects of health, and the effect of conditioning programs on the aging process; very little research has been directed toward examining the effects of interventions upon the improvement of the mental health and independence of older adults. Would an exercise program lead to a more active lifestyle? Would an active lifestyle help maintain the independence sought after by older adults? Since exercise and physical health are directly related, (Smith and Serfass, 1981) and since there is some evidence to support the theory that physical and mental health are related, (Birren, 1964) would an exercise program significantly affect the mental health of a group of older women? This study was designed in an attempt to provide some clarification of these questions and to provide information which may be useful in the field of health care services.

Statement of the Problem

The major aim of the study was to investigate the effects of a regular exercise program on the mental health and performance of daily tasks of a group of senior citizens. The study focused on two aspects of mental health: self-concept and general well-being. Self-concept in this study was composed of self-esteem, which is an evaluation of one's worth or significance; body image, which reflects one's assessment of the physical self; and self-image, which is a composite of feelings about oneself. Based on the literature, the investigator anticipated that the participants in the study would demonstrate an
increased level of self-esteem, self-image, and general well-being, an improved body image, and an enhanced ability to perform daily tasks as a result of participating in an exercise program.

Limitations

Several limitations of the study prohibited a generalization of the results. These are as follows:

1. The recruitment of participants was difficult and thus the number of subjects was small.
2. The participants were all women.
3. The mental health rating may have been affected by the use of volunteers since it has been demonstrated that older volunteers have more life satisfaction than older non-volunteers (Hunter, 1981).
4. The mental health rating may have been affected by extenuating circumstances such as family deaths, poor physical health or restricted finances at the time of the assessment.
5. The researcher, who was also the exercise instructor, may have affected the responses due to the expression of personal concern for and friendship with the participants.
6. The personal nature of some of the test items may have inhibited an honest answer by the respondents.

Summary

Rising health care costs necessitate finding a method to improve and/or maintain the health of our elderly population. Research has indicated that exercise may be the foundation of preventive health measures. Sidney (1978), in a study of the effects of a conditioning program on older adults, stated:
A program of physical training that improved the health and physical capacities, attitudes, and psychological well-being of older people to the point where they retained their independence would represent a significant achievement in preventive rehabilitative medicine (p.77).

Additional research, on the interrelationship of physical conditioning, mental health, and the maintenance of an independent lifestyle for the elderly, would be a step toward that achievement mentioned by Sidney.
CHAPTER 2

REVIEW OF LITERATURE

With the emphasis on youth and beauty in our culture, much of the American public has a fear of aging. The process of growing old is seen as dreadful, and deterioration of the physical and mental self is viewed as inevitable. Wrinkles, baldness, flabbiness, loss of vitality and strength, and loss of memory and mental alertness are conditions associated with aging. While some changes in physical and mental health do accompany the aging process, the retreat to a sedentary lifestyle of rocking chairs and bottles of pills is not inevitable for many people. Much of the literature on aging reports a brighter picture of our elderly population. Gerontologists have studied both mental and physical aspects of aging. The review of the literature is presented under the topics of mental health of the elderly, benefits of exercise, and the relationship between physical and mental health.

Mental Health of the Elderly

Mental health is a complex subject involving aspects such as life satisfaction, morale, emotional status, quality of self-maintenance, depression, self-esteem, and attitude toward the world and self. Although self-esteem, self-concept, self-identity, and self-image are often used interchangeably, there are subtle differences between the terms. Self-concept is a broad term involving all the elements that
comprise a view of oneself. Self-esteem refers to feelings of significance and worth (Sonstroem, 1984). Self-image and self-identity refer to descriptive phrases one might use about oneself such as optimistic, contented or relaxed. The assessment of a person's mental health is difficult and especially so in the elderly person. Due to the interaction of physical changes from aging and mental status, physicians are sometimes at a loss to determine whether a person is physically ill, or suffering from the effects of aging. In an article on functional assessment of the elderly persons, Lawton (1971) discussed the mutual interdependence of physical state, adaptive behavior and emotional state. A review of the literature in the field of mental health and aging highlighted several aspects of mental health related to the purpose of this study.

Morale

In an effort to determine differences in mental health between 264 community residents and 171 hospital subjects, Pierce and Clark (1973) found that morale was related to health. Their study indicated that community residents were significantly different from hospitalized subjects in the areas of life satisfaction, equanimity and the will to live. The authors concluded that morale has three aspects: life satisfaction; coping with day-to-day living; and anticipation of the future. According to Pierce and Clark, physical health was correlated with morale but was not a component of it. In a study to determine which factors were consistent among scales of morale, Lawton (1975) found that agitation, attitude toward one's own aging, and loneliness
were the major factors affecting morale. Lawton also stated that a person's health is highly related to morale.

Life Satisfaction

Life satisfaction is mentioned in several studies as an integral aspect of mental health. Toseland and Rausch (1979) listed 31 possible predictors of life satisfaction in a study of 871 people, aged 55 and over. They found that family life, personal health and the place of dwelling were the strongest predictors of life satisfaction. Edwards and Klemmack (1973) found socio-economic status, self-perceived health, and social interactions with a non-relative to be the most important variables related to life satisfaction. Their study included 273 women and 233 men over the age of 45.

Self-Concept and Self-Esteem

In an article on aging and the criteria of mental health, Birren and Renner (1981) discussed the difficulty of defining mental health. The authors made reference to Jahoda's criteria for good mental health among which were positive attitudes toward self, and growth development and self-actualization, which could be broadly termed self-concept. Sonstroem (1984) discussed the changes that have occurred in the theory of self-concept. The early emphasis was on treating self-concept as a unitary or global construct. The theory today is that there are multiple conceptions of the self which may be situation specific. Persons may think of themselves in different ways depending on the activity or role in which they are involved. Sonstroem did not discuss the
implications for the aged individual of the shift in thinking about self-concept.

In an effort to clarify the effect of aging on the attitude toward self, Kaplan and Pokorny (1970) interviewed 500 subjects, aged 30-60 plus years. Previous studies had reported conflicting results; some studies indicated that self-esteem decreased with age, and other studies reported the opposite effect. Kaplan and Pokorny (1970) used the Rosenberg "Scale of Self-esteem" to measure changes occurring with age. They found no significant relationship between age and self-derogation.

Although the concept of mental health is broad and difficult to define, studies of the elderly have concentrated on several major aspects. These aspects are morale, life satisfaction, and self-esteem. Results of studies indicate that physical health is closely associated with each of these aspects (Gissal, 1981; Edwards and Klemmack, 1973; Toseland and Rausch, 1979).

Mental and Emotional Benefits of Exercise

Most regular exercisers have reported mental and emotional benefits as well as physical improvements associated with their activity (Morgan, 1981; Sonstroem, 1984). They cite a general feeling of well-being as a reason for participation in a sports activity. However, the relationship between these feelings of well-being and specific attitudes about the self have sometimes been difficult to document scientifically.
Effect of Exercise on Self-concept and Self-esteem

Exercise has been used for a number of years in the treatment of depression, anxiety, and mood states. While a definite causal relationship has not been established between exercise and self-esteem, there are grounds for believing that an associative relationship exists (Sonstroem, 1984).

In a study of self-concept and locus of control and their relationship to patterns of eating, exercise and social participation, Bonds (1980) found no significant relationship among the variables. She found that high self-concept was associated with internal locus of control and related significantly to living alone, being older, having excellent self-rated health and a good appetite. In Bond's study, high self-concept was not related significantly to exercise. Gissal (1981) explored the effect of an exercise program on the morale of a group of senior citizens. She found no change in morale after the three-month program as measured by the Philadelphia Geriatric Center Morale Scale. However, a number of positive changes in activities of daily living and self-perceptions were noted in that study.

Effect of Exercise on Body Phenomena

The emphasis in our society on youth and beauty can lead to a deterioration of self-image in older people, especially as related to the body. Changes in physical condition such as flabbiness and wrinkles, and deterioration in visual and auditory acuity may result in older persons thinking of themselves as less able to function. Encouragement to "slow down and take it easy" may lead to a sedentary
lifestyle that results in further impairment of the physical self. One of the noticeable outcomes of regular exercise is improvement in physical shape and condition. This improvement may be reflected in better feelings about one's body.

Sidney and Shephard (1976) studied the effects of a regular three-month exercise program on body image, self-concept, life satisfaction, and attitudes toward physical activity in 60 men and 64 women whose average age was 65 years. Classes were held one hour a day, four times a week, with an emphasis on increasing physical endurance. Sidney and Shephard used Kenyon's "Attitudes Toward Physical Activity" (1968) and McPherson's "The Real Me" (1966) to assess changes in self-concept which was comprised of self-image and body image. McPherson states that "the purpose of this study was to assess changes in feelings and attitudes that people have about themselves" after exercise. Sidney and Shephard refer to the McPherson instrument as an indicator of mood changes. They found that individuals who exercised most often and with the greatest intensity demonstrated significant improvement in body image and mood. Those who participated less often or with less intensity had less improvement in body image and mood.

Kreitler and Kreitler (1970) reported on the body image of people over the age of 50. They indicated that older people tend to perceive their bodies as broader and heavier than they actually are. Activities of an easy nature are seen as quite strenuous, resulting in less desire to engage in physical tasks. A sedentary lifestyle leads to feelings of clumsiness and increased fear of physical activity. Inactivity results in free floating tension, insomnia, muscle degeneration,
restlessness, and fretfulness. The authors posited that regular exercise releases kinesthetic stimuli which provides emotional satisfaction and breaks the cycle of distortion in body image. Kreitler and Kreitler state further that exercise consumes free floating anxiety and prevents internalization of agressive tendencies, both of which may lead to depression.

Kreitler's ideas were supported by Rubin (1968) who stated:

Movement is essential for physical and mental well-being...a person's self-esteem is very closely tied to the ability to control the body and function as desired.... (Rubin, 1968, p. 23).

Plutchik, Weinter and Conte (1971) developed a series of paper-pencil tests to assess aspects of body image such as body satisfaction, body appearance, preferred body proportions and body boundaries. In a study of 165 subjects aged 20-83, the authors found that worries about illness, loss of limbs, or disability were not age-related and that people with differing physical or emotional disabilities had different body images. They also found that women tended to have more concerns about their bodies than men had about their bodies.

In a discussion of the development of the ideas of body image, Fisher and Cleveland (1969) referred to a German neurologist, Pick, who postulated that individuals develop a spatial image of their bodies. The image is an inner representation of the body gained from information supplied by the senses. Through physical activity people may alter the inner picture of their body as they develop better balance, more agility, coordination, and endurance.
Jourard and Secord (1955) conducted research on the attitudes of 60 women, aged 18-36 years, toward various body parts. The women were asked to give an "ideal" measurement for a body part and then measure themselves. The "ideal" measurement was always smaller than their own actual measurement of a given body part. The researchers maintained that women lose self-esteem when their body doesn't match the "ideal." The authors used Maslow's test of security-insecurity to assess self-esteem.

**Effect of Exercise on General Well-being**

In addition to the physical benefits of exercise, people often report an overall feeling of well-being which has been documented in several studies. Brunner (1969) found that people experience a feeling of well-being as a result of exercise. Brunner's study of 60 men, whose average age was 30 years, indicated that those who exercised regularly were significantly different from those who did not exercise, on eight of the 24 scales on the Gough Adjective Check List. The findings led Brunner to describe exercisers as extroverted, capable, persistent, conscientious, self-controlled, assertive, and action-oriented. The motivation given by the participants for exercising was "feeling better, having more energy, being more alert, sleeping better and being less moody." In a program of progressive conditioning, Sidney (1975) found that most of the subjects who completed the 14-week program reported improvements in physical well-being and a reduction in anxiety and in the frequency of illness.

Since mental health and physical health are closely related (Kreitler, 1970; Rubin, 1968; Schaie, 1981), it may be assumed that
changes in one's physical state might affect one's mental state. The literature indicated that participants in various types of training programs reported increases in general well-being, and improvement in body image, and self-esteem.

**Physical Benefits of Exercise for the Elderly**

**Cardiovascular Benefits**

Numerous studies have demonstrated the benefits of exercise on physical health. Smith (1978) compiled an extensive list of the effects of a regular exercise program on the physiological aging process. The author cited benefits to the cardiovascular system, as well as improvement in bone strength, flexibility and muscular strength. Smith concluded that, in general, exercise does not prevent the deterioration associated with aging, but it does help people use their faculties more easily and efficiently. Smith also stated that regular exercise combats the effects of degenerative disease such as arthritis.

Barry (1966) studied the effects of physical conditioning on work capacity, cardio-respiratory function, and work electrocardiogram. The eight subjects, whose mean age was 70 years, trained on a bicycle ergometer three times per week for three months. Barry found the mean work load limit as measured on the bicycle ergometer was 76 percent higher after training. There was a significant increase in the functional responses in oxygen uptake, pulmonary ventilation, systolic blood pressure and blood lactate levels.

In a ten-week exercise program for fifteen women ages 65-82 years, Parks (1980) found significant decreases in body fat and resting heart
rates and an increase in flexibility. Parks demonstrated that a program for seniors can be safe and effective and can improve fitness even at an older age. The author concluded that such a program may even reverse some of the physiological effects of aging such as stiffness, loss of range of motion, and decreases in endurance.

Musculo-skeletal Benefits

The effects of an exercise program designed specifically to improve the range of motion in older adults was studied by Munn (1981). Munn found that the participants were able to increase their range of motion from eight to 48 percent. The subjects' personal reactions at the end of Munn's program indicated that their daily life activities and comfort in movement were affected positively by the exercise program.

Fitts and Adrian reported on the effect of aging on joint flexibility in Aging and Exercise: the Scientific Basis (Smith and Serfass, 1981). The results of their studies indicated that much of the decrease in mobility experienced by the elderly is due to lack of movement. Soft tissues, such as muscles and tendon and joint capsules, can maintain their flexibility with physical training and movement.

Osteoporosis results from a loss of calcium by the skeletal system. Commonly called "bone loss," it is a major factor in some 300,000 hip fractures in elderly women every year. The effect of exercise on the retention of bone mass has important implications in the treatment of osteoporosis (Miani et al., 1981; Smith, 1981). In a study of the effect of exercise on calcium content in the bones, Brewer (1983)
found that middle-aged women runners maintained their bone mass longer than their sedentary counterparts.

Central Nervous System Benefits

In an article on the role of exercise and brain function in the elderly, Poon (1980) suggested that physical activity increased regional blood flow which may lead to the maintenance of higher levels of perfusion of the brain due to an increase in the number of patent capillaries. A second factor in maintaining brain function is the increase in oxygen transport. Poon also stated that persons with a large lung capacity (presumably as a result of exercise) may be more able to maintain a high level of blood oxygenation.

Harris (1975) noted the effects of exercise on the central nervous system. He stated that physical activity stimulated metabolism, respiration, blood circulation, digestion, and glands of external secretion, which may protect against senility.

Disease Prevention

In a study to investigate the relationships among aging, daily exercise and clinical symptoms as measured by the Cornell Medical Index, Cheraskin (1971) found exercise especially important in reducing clinical symptoms in the over 45 age group. He emphasized the role of physical activity in any program of preventive medicine.

A more specific aspect of disease prevention which is related to exercise is the effect of regular exercise on adult-onset diabetes. Shephard (1978) found that a regular program of endurance training can reduce or eliminate the need for insulin by elderly diabetics.
Relationship Between Mental and Physical Health

In an article on the implications of biological aging, Schaie (1981) discussed the relationship between mental and physical health. He stated that a low energy level may affect the development of friendships, participation in intellectually stimulating or physically invigorating activities, and the initiation of sexual activity. Accurate assessment of an older person's health is complex, due to the interrelationships among physical and mental health and the aging process. It is often difficult for a physician to determine if ailments are physical, or from depression due to losses such as the death of a spouse, diminished hearing, or displacement from their home. Health professionals are beginning to look beyond physical symptoms in their assessments of older adults. Questions are being asked which concern mental abilities and daily functioning in addition to questions about physical symptoms. Lawton, Ward, and Yaffe (1967) analyzed 52 separate measures of health. Using factor analysis, they were able to reduce the number of useful health indicators to approximately eight items. The authors concluded that no single index can properly represent an individual's health. Lawton also maintained that the ability to function on a daily basis is a measure of mental and physical health. He developed an instrument to assess the need for health services and institutionalization based on independent functioning in the community. Lawton's "Activities of Daily Living Instrument," (1969) included shopping, food preparation, housekeeping, and handling finances.
Traditionally, mental status has been evaluated with I.Q. tests or standardized measures of mental status. For many elderly persons, these tests are not reliable. Wolinsky (1984) discussed the necessity of looking at functional elements of health status as well as more global indicators such as the standardized tests. He was primarily interested in determining the need for health services based on a person's level of functioning. He specifically suggested using activities of daily living measures to tap both global and functional dimensions of a person's health.

The nursing profession is becoming increasingly aware of the relationship between physical condition and mental health. In a book on nursing management of the elderly, Carnevalli (1975) stated that exercise has both psychological and physiological benefits. These benefits include strengthening muscles and increasing muscle tone, improving range of motion and flexibility, relieving boredom, and reducing social isolation. She stated further that older persons who cannot move about freely begin to see themselves as old and ill.

The relationship between a vigorous four-month exercise program and biochemical and personality variables was studied by Ismail and Young (1977). Although the 90 subjects, aged 21-61 years, improved markedly in fitness, the researchers found little change in personality parameters using the Cattell Sixteen Personality Factor Questionnaire. Fitness levels were assessed using data from stress tests on a treadmill, EKG heart rate monitors, and body-fat-muscle ratios. The authors stated that "a program would have to be longer and more intense to cause dramatic changes in personality parameters." (p. 66)
Wright (1980) investigated the effect of participation in selected recreation programs on morale and leisure interests of 160 senior citizens. His subjects participated in motor activities, arts and crafts, and social recreation programs. He found significant positive correlations between morale and leisure interests and morale and participation in the program.

The relationship between physical and mental health is complex. It is often difficult to determine whether physical incapacities in the elderly are due to depression, or disease, or some combination of both. The ability to maintain independence and take care of self and home is related both to physical capacities and mental state. Thus, measures of health must assess the day-to-day level of functioning of the individual as well as physical and mental abilities.

Summary

Aging is a complex process involving both physical and mental capabilities. The literature indicates that physical health is a major factor in the mental health of older people. While there are many aspects of mental health, the ones most closely associated with physical health and with activity are self-esteem, self-image, body image, and general well-being. Numerous studies have demonstrated the positive effects of exercise on physical health (Smith and Serfass, 1981). However, in spite of the connection between physical and mental health, research has not been focused on determining the effects of exercise on emotional well-being or on the relationship between exercise and daily functioning in the older adult.
It is reasonable to expect that a regular exercise program will have a significant effect on the sedentary lifestyle of elderly individuals, resulting in more vitality, increased activity, and a general feeling of well-being. These factors may in turn improve the quality of life for senior citizens by contributing to their ability to maintain an independent lifestyle. Thus, the present study was designed to investigate the effects of exercise on selected mental health variables and on the performance of daily tasks.
In a previous exercise class for older adults conducted by the investigator, changes were observed in vitality, in animation, in self-expression, and in social interaction among participants. The investigator questioned whether these differences in mood and behavior reflected changes in the emotional and mental outlook of the participants as a result of the exercise program or whether these differences resulted from the social interaction among the participants. The present study was formulated in an attempt to systematically document the types of changes previously observed and ascertain the reasons for those changes.

The purpose of the study was to investigate the effect of a regular exercise program on selected aspects of mental health of a group of senior citizens and on their ability to perform daily tasks. Self-esteem, self-image, body image and general well-being were selected as specific aspects of mental health due to their close association with exercise.
The Pilot Study

Prior to beginning the study, the investigator conducted an exercise class for 18 months at the Bozeman Senior Center. The pilot study was conducted to gain experience and knowledge while working with exercise and older adults. Six women participated in the program initially. By the end of the program one and one-half years later, there were twelve women who participated regularly.

The information gained from the pilot study served as a basis for program development in the present study. The researcher used that knowledge in planning the following areas:

1. Length of the exercise program in months. Several months were required before the participants began to notice any physical changes, and additional time passed before mood differences were reported. Many other programs for older adults last three months or less with little change in personality variables of the participants. Thus, the investigator determined that it was necessary to conduct the exercise program for a minimum of one year.

2. Rapidity with which new exercises could be introduced. It was sometimes difficult for participants in the pilot study to remember the exercises and exactly how to do each one. Therefore, only one or two new exercises were introduced during any two-week period.

3. Management of agility problems. Some members had great difficulty getting up and down from the floor and rolling from side to side. Time was spent during class teaching the easiest ways to roll over, to get up on hands and knees, and to stand up. Some activities were
modified so that they could be done sitting in a chair.

4. Researcher's expectations of the physical changes in the participants. Flexibility and stamina were the first components of fitness to increase. Strength increased very slowly.

5. Knowledge of the relationship between attendance and commitment to the program. Several women attended the pilot study classes rather irregularly and eventually dropped out. Those women who attended two or three times during the first two weeks of classes maintained a commitment to the program and attended regularly.

6. Recruitment difficulties. The pilot study began with only six participants and attempts to recruit other members at the Senior Center met with some resistance. The best method of recruitment in the pilot study seemed to be word-of-mouth.

7. Format of the exercise program. The order of exercises, pacing, music, and educational information of the present exercise program was based on the information developed during the pilot study.

   Effective methods of presenting the exercises and particular problems in everyday living were discussed with participants in the pilot study. The women volunteered their ideas and suggestions for improvement in the instruction and organization of the class.

   In an evaluation of the pilot program, the women said that they felt more flexible, had more stamina, were less moody, slept better and were not as "stiff in their joints." They also indicated that they thought many more of their friends should participate in such a program.
Research Design

The study was designed to evaluate the effects of an exercise program on two concepts: mental health and performance of daily tasks. The mental health variables measured were self-concept, comprised of self-esteem, self-image and body image; and general well-being. The daily tasks variable was measured by the participant's perception of the ease of performance of selected tasks of everyday living.

Participants

Participants were recruited with the help of the manager of a retirement complex in April, 1982. The possibility of using the facility for an exercise class which was to be the basis of a study on exercise and aging was discussed with the manager. With the manager's cooperation, a meeting was arranged in May, 1982 to explain the purpose of the study to the residents of the complex. About a dozen of the 120 residents attended the informational meeting. The study was described by the researcher as an investigation of the relationship between exercise and aging.

To be included in the study, participants had to be willing to participate in the exercise classes three times per week for one year, to complete all forms required for the study, (a fitness health survey, personal progress chart, and a final evaluation, in addition to test instruments) and to obtain a physician's permission. Participants had to be 65 years of age or older.
Only four or five of the women who attended the meeting in May volunteered for the study. With the help of the manager, additional women were recruited until a total of nine women were recruited by July 1, 1982, when the first phase of the study began. Recruitment efforts continued throughout the summer until seventeen women had agreed to participate in the study.

Fourteen of the seventeen women lived at the retirement complex in Bozeman, Montana. The other three women lived in their own homes near the complex. The participants ranged in age from 66-83 years with an average age of 77.5 years. Two of the women were married and the others were widowed. All participants were in general good health although several women had weight problems, arthritic conditions, or slight hearing or visual impairments. These health problems at times restricted their full participation in the exercise program. Only a few of the women knew each other when the study began.

Groups

The study was divided into two phases—a socialization phase and an exercise phase. The initial nine volunteers participated in the socialization phase during July, 1982. Four of those women, plus the additional thirteen recruits then formed the exercise and control groups for the second phase of the study which began August 1, 1982 and terminated June 30, 1983.

Socialization Group. Research by Wright (1980) indicated that social interaction was an important part of the "feeling better" effect experienced by the participants in an exercise program. In an attempt
to isolate the socialization effect from the effects of the exercise program, the initial nine participants met together without exercising. The socialization group met three times per week for discussion during the month of July, 1982. The purpose of the supervised discussion was two-fold: to help the members become better acquainted; and to assess the effect of simply meeting together socially. Topics of discussion included childhood experiences, hobbies and outside interests, and knowledge about diet and proper nutrition.

Exercise Group. The second phase of the study began in August, 1982, with the exercise program. There were eleven women in the exercise group, four of whom had also participated in the socialization group. The exercises used in the program were developed by the investigator and adapted from the work of Smith (1978), Frankel (1977), Rosenberg (1977), and the 1968 bulletin prepared by the President's Council on Physical Fitness and Sports in conjunction with the Administration on Aging. The specific exercises are listed in Appendix B.

At the initial meeting of the class, participants learned to take their working heart rate. They were encouraged to get their blood pressures taken at the monthly clinics at the Senior Center. After the first week of classes, each member was given a personal record sheet on which she recorded body measurements, blood pressure, resting heart rate, and the success in performing certain exercises involving flexibility and strength. The personal record sheet is found in Appendix A. The women were asked to record their progress every three months during the study on the personal record sheet. The record keeping was
used as a motivational technique rather than as actual data collection.

The literature indicated that perceptions of fitness levels, as well as actual changes in fitness levels, may affect self-concept measures. The investigator used the information from the personal record sheets in examining the extent to which physical changes may have influenced the data.

All exercises were done to tape recorded music. The music was chosen with older adults in mind and consisted of waltzes and other slow tempo pieces. The aerobic exercises were done to march music.

After the beginning stage of the program, when the participants were familiar with the exercises, they were encouraged to continue to exercise on their own on weekends and during vacations. Most of the participants then began walking from six blocks to several miles weekly. At the request of the participants, the investigator taped several classes for use during Thanksgiving, Christmas and Easter vacations.

The participants met for exercise at the retirement complex three times per week from August, 1982, until the end of June, 1983. Regular attendance was emphasized and absences were followed up with personal contact by the instructor. Participants usually notified the instructor if they were going to be absent. Attendance two to three times per week was typical for the majority of the women. Class time was used once every three months for progress evaluation at which time achievements were shared and an atmosphere of group support was developed.
Control Group. Seven friends and neighbors of the participants were recruited to serve as a control group. The control group members did not meet together formally with the socialization group, nor did they meet with the exercise group during the study. At the onset of the study, members of the control group were not participating in any other exercise or socialization program known to the investigator.

Testing Schedule

The same battery of tests was given to all three groups. The socialization group was tested for changes in self-concept, general well-being, and performance of daily tasks at the beginning and end of July, 1982. Of the initial nine participants in the socialization group, one had died and two had dropped out, leaving six members in the group. Four of the six women in the socialization group volunteered to continue as members of the exercise group. The post-socialization scores on the test instruments for the four women became their pretest scores for the exercise program. Thus, changes in scores after the socialization program for these four women might be attributed to their participation in the exercise program.

When the exercise phase of the study began in August, 1982, the participants were tested as a whole group. When new members joined the program during September, 1982, the tests were individually administered. Participants with visual or comprehension difficulties were tested individually. No new participants were accepted for the study after October 1, 1982. At the completion of the study in June, 1983, the set of instruments was readministered to all the participants in the
exercise group. The set of instruments was individually administered to the control group in September, 1982. The members of the control group were retested at the completion of the study in June, 1983. The testing schedule is presented in Figure 1.

Figure 1. Testing Schedule

<table>
<thead>
<tr>
<th>Socialization Group</th>
<th>Experimental Group</th>
<th>Control Group</th>
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<tbody>
<tr>
<td>N=9</td>
<td>N=11</td>
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<td>N=6</td>
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Instruments

Five instruments were used to test the variables in the study. The instruments chosen from the literature to measure self-concept were Rosenberg's "Scale of Self-esteem" (1965), McPherson's "The Real Me" (1966), and the body image section of Kenyon's "Attitudes Toward Physical Activity" (1968). The "General Well-being Inventory" and the "Activities of Daily Living Questionnaire" were specifically designed by the investigator for this study. The former instrument assessed well-being; the latter measured participant perception of the ease of performance of daily tasks. The set of five instruments was administered to all three groups.
Self-concept

Self-concept in this study consisted of measures of self-esteem, self-image and body image. Rosenberg's "Scale of Self-esteem" (1965) was used to measure changes which might occur in feelings of self-worth. McPherson's "The Real Me" (1966) was used to measure changes in feelings and attitudes related to self-image. A section of Kenyon's "Attitudes Toward Physical Activity" was chosen to measure changes in real and ideal body image.

Self-esteem. "The Scale of Self-esteem" was developed by Rosenberg in 1965 for use with adolescents. It was tested on 5,024 public high school juniors and seniors in New York state. The instrument consists of ten statements concerning self-esteem, e.g., "Sometimes I think I am no good at all;" "On the whole I am satisfied with myself." Respondents are asked to agree or disagree with the statements. Rosenberg (1965) listed the reproducibility of the scale at .93. Items are grouped for scoring purposes so that the optimal score for the ten items is six. The Rosenberg "Scale of Self-esteem" is found in Appendix C.

Self-image. "The Real Me" was designed by McPherson in 1966 to assess changes in self-image of post-cardiac patients as a result of a six-month exercise program. The instrument is based on a semantic differential and respondents choose between pairs of adjectives related to feelings about themselves before and after exercising, e.g., contented-dissatisfied, discouraged-hopeful, quarrelsome-amicable. The
twenty-five items are scored from 1-7 so that the more desirable answer for each pair of adjectives receives a rating of 1. The optimal score of the instrument is 25. Reliability and validity scores of the instrument were not reported in the literature. "The Real Me" instrument is found in Appendix D.

Body Image. Kenyon's "Attitudes Toward Physical Activity" (1968) was selected to assess changes in body image. The investigator chose to use only the body image section of the instrument which is entitled "My Body as it really is - As I would like to see it." The body image section of Kenyon's "Attitudes Toward Physical Activity" instrument was developed as part of an assessment of the relationship between certain personality characteristics and attitudes toward physical activity in high school students. The tool is a semantic differential in which respondents choose between seven paired adjectives that relate to "My body as it really is" and "My body as I would like to see it," e.g., ugly-beautiful, graceful-awkward, sick-healthy. These two components are labelled the real and the ideal body image. The responses are weighted 1-7 with seven being the optimal answer. The highest possible score for the instrument is 49. The instrument was tested on 3,099 high school students. Hoyt reliabilities based upon a priori and maxi-mixed weights were .672 and .718, respectively. The body image instrument is found in Appendix E.

General Well-being and Performance of Daily Tasks

A review of the literature revealed several tools used by other investigators to assess well-being and activities of daily living.
However, none of these instruments seemed suited to the purpose of this study. Thus, the investigator designed the following two instruments.

**General Well-being Inventory.** The instrument was designed for the present study to assess how respondents feel on a day-to-day basis about such topics as loneliness, boredom, energy levels, and sleeping habits. The twenty items in the inventory were adapted from the work of Rosow and Breslau (1977), Brunner (1969), and Preston and Gudiksen (1975). Comments from participants in the pilot study were also considered in the choice of items for this instrument. Items included "I sleep better now," "I have a better appetite," "I have more energy," and "I feel more alert." The items were rated from 1, meaning occasionally experience it, to 4, meaning always experience it. An optimal score for this instrument was 41. This instrument was not tested for reliability and validity. The "General Well-being Inventory" is found in Appendix F.

**Activities of Daily Living Questionnaire**

The instrument was developed for this study to assess the participant's perception of the ease or difficulty with which daily living tasks were performed before and after the exercise program. The 16 items in the questionnaire were based on the work of Gutman (1977) and Lawton and Brody (1969). Items included scrubbing floors, shopping, carrying a basket of wet laundry, and gardening. The items were rated on a scale of 0–3, with three representing an easily accomplished task, and zero representing one which could not be performed at all. The
optimal score for this instrument is 48. The "Activities of Daily Living Questionnaire" is included in Appendix G.

Summary of the Design

The focus of this study was to determine the effect of exercise and socialization programs on selected aspects of mental health and on the performance of daily tasks. The variables of mental health were self-concept, consisting of self-esteem, self-image, and body image; and general well-being. Five instruments were used to assess the changes in the variables as a result of the socialization and exercise programs. There were three groups of participants in the study. A schematic representation of the design of the study is presented in Figure 2.
Figure 2. Schematic of the Design

GROUPS
- Socialization
- Exercise
- Control

Mental Health
- Self-Esteem (Rosenberg)
- Self-Image (McPherson)
- Body Image (Kenyon)
- Well-Being (Cater)

Performance of Daily Tasks (Cater)
Data Analysis

Optimal scores are reported in the literature for the Rosenberg (1965), McPherson (1966), and Kenyon (1968) instruments. Optimal scores for the two instruments designed for this study were established by the investigator. The individual scores for each instrument were then compared to the optimal score before and after each phase to determine whether any change in score was toward or away from the optimal score. Changes were recorded with a "plus" for those moving toward the optimal scores and with a "minus" for changes in the opposite direction regardless of the numerical value of the change. Thus a change of one point was treated the same as a change of ten points. A record was then obtained for each individual's performance on the five test instruments and also for each group—socialization, exercise, and control. The raw scores are found in Appendix H. The percentage of each group scoring in a positive direction was also determined to facilitate comparing the effects of socialization as opposed to exercise or no program at all. The post socialization scores served as the pretest scores for the four participants who participated in both socialization and exercise groups.

The data were examined on an individual basis, considering factors such as age, physical condition, attendance, and extenuating circumstances in order to ascertain the effect of these variables on the concepts of the study. The individual data were then explored by group to determine the effectiveness of socialization and exercise on the selected aspects of mental health and on daily tasks performance.
Summary

The purpose of the study was to ascertain the effect of an exercise program on selected aspects of mental health and on daily tasks performance in a group of senior citizens. Seventeen women were recruited to serve as participants in the study. They were members of a month-long socialization group, or a ten-month exercise program, or both, or a control group. Five instruments were chosen to measure changes in self-concept, general well-being and the performance of daily tasks. The data were examined for changes in the variables by groups and also for individual differences among the participants.
CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to ascertain whether a ten-month program of regular exercise (three times per week for one hour) would improve selected aspects of mental health and the performance of daily tasks of a group of older women ranging in age from 66-83 years. The aspects of mental health chosen for this study were self-concept and general well-being.

Analysis of the results of the study presented some unique problems due to the small sample size and the nature of the concepts being tested. Thus, the investigator chose to examine the results both on an individual basis and by group.

Individual Results

Every three months during the study, the participants in the exercise group kept a record of their progress in performing certain exercises, their circumferences, and they recorded their present blood pressures. The record keeping was used for motivation rather than for actual data collection. The physical changes reported by the participants in the exercise program at the end of the study included weight and inches gained or lost, energy level, and blood pressure. Previous research by Sidney and Shephard (1976), Morgan (1979), and Schaie (1981), indicated a relationship between physical and mental
health. Sonstroem (1984) reported that perceptions of fitness levels may be related to self-esteem. It seemed that physical changes and individual extenuating circumstances may have influenced the results in the present study. Therefore, these factors, as well as the direction of change in test scores, are reported in the following individual profiles.
Personal Profiles of Exercise Participants

Participant 2565. The participant volunteered for both the socialization phase and the exercise program. This woman was 75 years old and had no physical limitations. However, she did not attend regularly, and missed many class meetings during the final two months of the study. She rated her health as good when the study began. She showed improvement on measures of self-esteem and self-image, but declined in scores on activities of daily living. She showed more discrepancy between the real and ideal body image scores after the program and reported losing three inches while maintaining the same weight. Her blood pressure remained the same and her energy level was better than it had previously been.

Table 1. Profile of Participant 2565.

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S.E. - Self-esteem
S.I. - Self-image
R. - Real Body Image
I. - Ideal Body Image
D. - Discrepancy between real and ideal body image
W.B. - Well-being
Tasks - Performance of daily tasks
n.c. - no change in score
inc. - increase
dec. - decrease

+ indicates positive direction
- indicates negative direction
B.P. - blood pressure
In. - inches
Wt. - weight
Ener. - energy level
Ext. Cir. - extenuating circumstances
g. - gain
l. - loss
Participant 6092. This 82 year-old woman participated in both the socialization and exercise phases of the program. She had arthritis in her knees and hip and suffered a tibial fracture from a fall during the last month of class. She rated her health as good and had been a gymnast in the past. She attended class regularly up to the time of her accident and was enthusiastic about exercising. She showed improvement on the McPherson measure of self-image, and retained the same score on the Rosenberg measure of self-esteem. There was more discrepancy in body image, although she showed improvement in real body image. She improved in the performance of daily tasks, but her well-being score declined. She lost two inches although her weight remained the same. She reported her energy level as better in spite of her broken leg.

Table 2. Profile of Participant 6092.

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S.E. - Self-esteem
S.I. - Self-image
R. - Real Body Image
I. - Ideal Body Image
D. - Discrepancy between real and ideal body image
W.B. - Well-being
Tasks - Performance of daily tasks
n.c. - no change in score
n.a. - score not available
inc. - increase
dec. - decrease

+ indicates positive direction
- indicates negative direction
B.P. - blood pressure
In. - inches
Wt. - weight
Ener. - energy level
Ext. Cir. - extenuating circumstances

g. - gain
l. - loss
Participant 0644. At age 71, this woman had no physical limitations, although she smoked two packages of cigarettes per day. She participated in both the socialization and exercise phases of the program. She rated her health as good and attended class regularly. Her scores improved on well-being and daily task performance. The score declined on the Rosenberg Scale of Self-esteem and improved on the McPherson measure of self-image. The discrepancy between real and ideal body image decreased although she reported gaining 1 1/2 inches and six pounds. She indicated a lower blood pressure and a good energy level.

Table 3. Profile of Participant 0644.

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S.E. - Self-esteem
S.I. - Self-image
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Ener. - energy level
Ext. Cir. - extenuating circumstances
g. - gain
l. - loss
Participant 9065. This 83 year-old participant volunteered for both phases of the program. She had limited mobility, due primarily to being very overweight. Also, she had previously suffered from phlebitis. She rated her health as fair, although she improved greatly in her ability to do the exercises and even began walking with a cane instead of a walker. This woman attended class regularly until March when she dropped out saying she was too tired to continue. Her scores improved in self-image; and declined in self-esteem, well-being, and activities of daily living. The discrepancy between real and ideal body image increased. She reported a lower blood pressure, very little weight loss, no inches lost and a fair energy level.

Table 4. Profile of Participant 9065.

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S.E. - Self-esteem  
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Ener. - energy level  
Ext. Cir. - extenuating circumstances  
g. - gain  
l. - loss
The following participants were members of the exercise group only.

**Participant 3592.** As one of the younger members of the exercise group, this woman, aged 66, showed the greatest change physically. She lost a total of nine inches and seven pounds. Her blood pressure was lower and her energy level was reported as good. She had no physical limitations, although she had previously suffered from temporal arteritis. She rated her health as fair at the beginning of the study. She had played basketball and volleyball in school. This woman attended sessions regularly and served as class leader during vacation periods when the investigator was absent. Her scores improved in self-image, real body image, well-being, and tasks performance. The discrepancy between real and ideal body image decreased.

Table 5. Profile of Participant 3592.

<table>
<thead>
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<th>Self-concept</th>
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<th>Tasks</th>
<th>B.P.</th>
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<th>Ext. Cir.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E.</td>
<td>S.I.</td>
<td>Body Image</td>
<td>R.</td>
<td>I.</td>
<td>D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n.c.</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>dec.</td>
<td>+</td>
<td>+</td>
<td>lower</td>
</tr>
</tbody>
</table>

S.E. - Self-esteem  
S.I. - Self-image  
R. - Real Body Image  
I. - Ideal Body Image  
D. - Discrepancy between real and ideal body image  
W.B. - Well-being  
Tasks - Performance of daily tasks  
n.c. - no change in score  
n.a. - score not available  
inc. - increase  
dec. - decrease

+ indicates positive direction  
- indicates negative direction  
B.P. - blood pressure  
In. - inches  
Wt. - weight  
Ener. - energy level  
Ext. Cir. - extenuating circumstances  
g. - gain  
l. - loss
Participant 3085. This woman had no physical limitations, but was very thin and reported having low blood pressure at the onset of the study. She was 82 years old, and missed several months of class due to vacations to visit family. She rated her health as good. Her scores improved in self-esteem, self-image, real body image, and tasks, but declined in well-being. She reported an increase in blood pressure at the end of the study and had gained eight pounds. This participant died six months after the conclusion of the program of causes unknown to the investigator.

Table 6. Profile of Participant 3085.

<table>
<thead>
<tr>
<th></th>
<th>W.B. Tasks</th>
<th>B.P.</th>
<th>In Wt.</th>
<th>Ener.</th>
<th>Ext. Cir.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I. Body Image</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. I. D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+ + + - dec. - + higher n.a. 8 g. n.c. vacations

- S.E. – Self-esteem
- S.I. – Self-image
- R. – Real Body Image
- I. – Ideal Body Image
- D. – Discrepancy between real and ideal body image
- W.B. – Well-being
- Tasks – Performance of daily tasks
- n.c. – no change in score
- n.a. – score not available
- inc. – increase
- dec. – decrease

+ indicates positive direction
- indicates negative direction
B.P. – blood pressure
In. – inches
Wt. – weight
Ener. – energy level
Ext. Cir. – extenuating circumstances

g. – gain
l. – loss
Participant 9226. Physical improvements during the course of the study influenced this 72 year-old woman's scores, as she lost ten inches and four pounds during the study. Her verbal comments indicated she attributed this loss to the exercise program. She had no physical limitations and was very regular in attendance except for a month-long visit to her daughter. She said she continued to exercise while she was away. She rated her health as good, but reported having high blood pressure when the study began. Her scores improved in self-esteem, self-image, and task performance. The body image discrepancy increased although she improved greatly in real body image. She also lowered her blood pressure, which she felt was a result of the exercise class. Her energy level was good at the end of the program. She enrolled in exercise classes for older adults subsequent to this study.

Table 7. Profile of Participant 9226.

<table>
<thead>
<tr>
<th>Self-concept</th>
<th>W.B. Tasks</th>
<th>B.P.</th>
<th>In</th>
<th>Wt.</th>
<th>Ener.</th>
<th>Ext. Cir.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. I. D.</td>
<td>+ + + + inc.</td>
<td>n.a.</td>
<td>+ lower</td>
<td>10</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

S.E. - Self-esteem  
S.I. - Self-image  
R. - Real Body Image  
I. - Ideal Body Image  
D. - Discrepancy between real and ideal body image  
W.B. - Well-being  
Tasks - Performance of daily tasks  
n.c. - no change in score  
n.a. - score not available  
inc. - increase  
dec. - decrease  

+ indicates positive direction  
- indicates negative direction  
B.P. - blood pressure  
In. - inches  
Wt. - weight  
Ener. - energy level  
Ext. Cir. - extenuating circumstances  
g. - gain  
l. - loss
Participant 1134. This woman was 82 years old and had both visual and auditory impairments that at times affected her ability to participate. She came to class regularly until the Spring, when she was ill for two months. She rated her health as good. Her scores improved on the McPherson measure of self-image, but declined in self-esteem, well-being, and task performance. She showed more discrepancy in body image after the program due to a decline in real body image scores. She reported normal blood pressure, no change in weight, and a fair energy level.

Table 8. Profile of Participant 1134.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I. Body Image</td>
<td>R. I. D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- + n.c. inc. - normal n.a. n.c. first illness</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

S.E. - Self-esteem
S.I. - Self-image
R. - Real Body Image
I. - Ideal Body Image
D. - Discrepancy between real and ideal body image
W.B. - Well-being
Tasks - Performance of daily tasks
n.c. - no change in score
n.a. - score not available
inc. - increase
dec. - decrease

+ indicates positive direction
- indicates negative direction
B.P. - blood pressure
In. - inches
Wt. - weight
Ener. - energy level
Ext. Cir. - extenuating circumstances

g. - gain
l. - loss
Participant 6079. At age 83, this woman had severe arthritis in her knees and could put very little weight on them. She had great difficulty getting up and down from the floor and was somewhat uncoordinated. After several months of class she was able to get up from the floor without help from the other participants. She rated her health as fair and often talked of missing friends in Illinois where she had lived prior to moving to be near her son. She attended class two days per week. Her scores improved in well-being, activities of daily living and real body image. The scores declined in scores in self-esteem and self-image. She indicated that there had been no change in any of the physical measures.

Table 9. Profile of Participant 6079.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I. Body Image</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R. I. D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ + + + n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
<td>none*</td>
<td></td>
</tr>
</tbody>
</table>

S.E. - Self-esteem
S.I. - Self-image
R. - Real Body Image
I. - Ideal Body Image
D. - Discrepancy between real and ideal body image
W.B. - Well-being
Tasks - Performance of daily tasks
n.c. - no change in score
n.a. - score not available
inc. - increase
dec. - decrease

+ indicates positive direction
- indicates negative direction
B.P. - blood pressure
In. - inches
Wt. - weight
Ener. - energy level
Ext. Cir. - extenuating circumstances
g. - gain
l. - loss

* loneliness?
Participant 5182. This 75 year-old woman had no physical limitations, but was quite concerned about her heart when classes began. She had previously had very high blood pressure and was often short of breath when the exercise program began. She rated her health as good, and had participated in basketball and baseball in school. She attended almost every class during the study. She lowered her blood pressure, and was able to maintain ten minutes of aerobic activity by the end of the class. She indicated a three-pound weight loss and a better energy level. Her scores improved in self-image, well-being, task performance, and real body image. She continues to attend exercise classes for older adults.

Table 10. Profile of Participant 5182.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I. Body Image</td>
<td>R. I. D.</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>inc.</td>
<td>+</td>
</tr>
</tbody>
</table>

S.E. - Self-esteem  
S.I. - Self-image  
R. - Real Body Image  
I. - Ideal Body Image  
D. - Discrepancy between real and ideal body image  
W.B. - Well-being  
Tasks - Performance of daily tasks  
n.c. - no change in score  
n.a. - score not available  
inc. - increase  
dec. - decrease

+ indicates positive direction  
- indicates negative direction  
B.P. - blood pressure  
In. - inches  
Wt. - weight  
Ener. - energy level  
Ext. Cir. - extenuating circumstances  
g. - gain  
l. - loss
Participant 8168. This woman was 80 years old and had osteoporosis, which made some of the floor exercises difficult for her. She rated her health as excellent at the beginning of the study. She was ill during the last two months of class and expressed concern at being tired. She indicated her blood pressure was normal and that she had lost two inches and about five pounds. She indicated no change in energy level, although this report is questionable, as she often seemed fatigued by the end of class. Her score improved in well-being, but declined on all other measures.

Table 11. Profile of Participant 8168.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. S.I. Body Image</td>
<td>R. I. D.</td>
<td>-</td>
<td>-</td>
<td>dec.</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

S.E. - Self-esteem  
S.I. - Self-image  
R. - Real Body Image  
I. - Ideal Body Image  
D. - Discrepancy between real and ideal body image  
W.B. - Well-being  
Tasks - Performance of daily tasks  
n.c. - no change in score  
n.a. - score not available  
inc. - increase  
dec. - decrease

+ indicates positive direction  
- indicates negative direction  
B.P. - blood pressure  
In. - inches  
Wt. - weight  
Ener. - energy level  
Ext. Cir. - extenuating circumstances  
g. - gain  
l. - loss
Summary of Individual Results

There were no individuals who scored positively on all instruments. Number 3592 showed the greatest improvement, i.e., her scores improved in self-image, body image, well-being, and the performance of daily tasks. Two women, numbers 1134 and 8168, showed a decrease in scores on most of the test instruments. The other eight individuals showed very mixed results, changing positively on some measures and negatively on the others.

In examining the results by individual, the investigator found that the younger women, those aged 65-75, showed more positive changes than those in their 80s, with the exception of subject 6092 who was 83 years old. The women who attended two of three times per week also scored more positively on the instruments than those who only attended once or twice per week. The illnesses and absences of subjects 9065, 1134, 8168, and 3085, coupled with their ages, very likely affected their scores in a negative way.

Evaluation of the Two Phases of the Study

The purpose of the study was to evaluate the effectiveness of a regular exercise program on selected aspects of mental health and on the performance of daily tasks. In order to separate the effect of meeting together socially from the effect of the exercise program, the study was organized so that a socialization phase occurred during the first month of the study and was followed by a ten-month exercise program. For the participants who completed both phases
of the program, the posttest scores of the socialization phase were used as the pretest scores for the exercise program.

Mental Health

The assessment of mental health in this study involved measuring changes in self-concept and general well-being. There were three components of self-concept: self-esteem, self-image, and body image.

Self-esteem. There was no clear trend in the results using the Rosenberg Scale of Self-esteem (1965). Of the six women participating in the socialization phase, two women did not complete the instrument; one woman's score decreased, and one woman's score increased. Of the eleven women in the exercise group, three scores (27%) improved, two scores remained the same, and six women's scores decreased. The scores of three of the four women in the control group decreased on this instrument. The fourth woman's score improved. The direction of change of each participant's score for all three groups on the Rosenberg "Scale of Self-esteem" is presented in Table 12.
Table 12. Direction of change in self-esteem as measured by the Rosenberg "Scale of Self-esteem."

<table>
<thead>
<tr>
<th>Socialization Group N=6</th>
<th>Exercise Group N=11</th>
<th>Control Group N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2565 -</td>
<td>2565 +</td>
<td>7436 -</td>
</tr>
<tr>
<td>6092 +</td>
<td>6092 n.c.</td>
<td>8183 -</td>
</tr>
<tr>
<td>0644 n.c.</td>
<td>0644 -</td>
<td>3936 -</td>
</tr>
<tr>
<td>9065 n.a.</td>
<td>9065 -</td>
<td>3078 +</td>
</tr>
<tr>
<td>6060 n.c.</td>
<td>3592 n.c.</td>
<td></td>
</tr>
<tr>
<td>3173 n.a.</td>
<td>3085 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9226 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1134 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6079 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5182 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8168 -</td>
<td></td>
</tr>
</tbody>
</table>

n.a. - not available
n.c. - no change in score
+ indicates positive change
- indicates negative change

The scores of the majority of participants in the socialization and exercise groups either decreased or showed no change in self-esteem using the Rosenberg instrument. Several of the participants had difficulty marking whether they agreed or disagreed with an item due to the wording of the sentences. This difficulty raised questions about the reliability of their answers.

The procedure for scoring the Rosenberg instrument is complex; thus, the results may not be an accurate reflection of the changes which occurred in the participants. Several items are grouped together and then given a numerical score of "1" if one of the two, or two of three items are answered positively. The top score for the ten items is six.
All except one of the participants scored five or six, on both the pre-test and posttest. Furthermore, scores generally changed only one point before and after the program. Thus, it was not possible with the small sample to demonstrate a statistically significant change. Also, an individual may have answered several items differently from pretest to posttest, but because of the grouping procedure, those differences were not noted by a change in the total score.

There were no studies in the literature that indicated use of the Rosenberg "Scale of Self-esteem" in examining exercise and self-esteem. Kaplan and Pokorny (1970) used the Rosenberg Scale in a study of the relationship between self-derogation and aging. Theirs was the only study found in the literature which indicated use of this instrument with older adults. Kaplan and Pokorny did not find a significant relationship between aging and self-derogation using the Rosenberg Scale.

Jourard and Secord (1955), using Maslow's test of security-insecurity, found in their study that self-esteem scores decreased when body image did not match the "ideal." The present study does not support the findings of Jourard and Secord. There were four women in the exercise group whose real body image came closer to the "ideal" after the program. Of those four, two women's scores decreased in self-esteem, one woman's score increased in self-esteem and one score did not change. For five women in the exercise group, the discrepancy between real body image and the "ideal" increased. Of those five, two women's scores decreased in self-esteem, two women's scores increased in self-esteem, and one score did not change. Thus, there was no clear association between self-esteem and ideal body image in this study.
The decrease of self-esteem scores in this study was contrary to the expected result and to verbal comments made by the participants at the conclusion of the study. It is possible that the Rosenberg instrument is not a useful tool to measure changes in self-esteem related to exercise. The Rosenberg Scale is a global instrument, measuring overall attitude toward oneself. The Encyclopedic Dictionary (Harre and Lamb, 1983) defines self-esteem as a personality construct showing little change after its formation in mid-childhood. It may be that self-esteem in older adults would only be affected by more dramatic events than exercise programs. Use of the Rosenberg Scale may be inappropriate with this group of people due to difficulties in administering and scoring the instrument.

**Self-image.** Self-image was assessed with McPherson's "The Real Me," a semantic differential tool designed to measure changes in feelings and attitudes which occur after an exercise program. Items include feeling more content, hopeful, relaxed and optimistic. The direction of change of the scores for each participant in all groups on the McPherson instrument is presented in Table 13.
Table 13. Direction of change in self-image as measured by McPherson's "The Real Me."

<table>
<thead>
<tr>
<th>Socialization Group N=6</th>
<th>Exercise Group N=11</th>
<th>Control Group N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2565 -</td>
<td>2565 +</td>
<td>7436 n.a.</td>
</tr>
<tr>
<td>6092 +</td>
<td>6092 +</td>
<td>8183 +</td>
</tr>
<tr>
<td>0644 n.c.</td>
<td>0644 +</td>
<td>3936 n.a.</td>
</tr>
<tr>
<td>9065 +</td>
<td>9065 +</td>
<td>3078 n.a.</td>
</tr>
<tr>
<td>6060 +</td>
<td>3592 +</td>
<td></td>
</tr>
<tr>
<td>3173 n.a.</td>
<td>3085 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9226 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1134 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6079 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5182 +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8168 -</td>
<td></td>
</tr>
</tbody>
</table>

n.a. - not available
n.c. - no change in score
+ indicates positive change
- indicates negative change.

The overall trend was an improvement in scores on this instrument. In the socialization group, three women's scores (50%) improved, one score remained the same, one score was unavailable, and one score decreased. The scores of nine of the eleven women (82%) in the exercise group improved, one score remained the same, and two scores decreased. Only one score was available in the control group, and that woman's score increased.

Sidney and Shephard (1976) found that participants in their study who increased their aerobic power showed an improvement in self-image scores as measured by the McPherson instrument. These researchers also
found that subjects with little or no gain in aerobic capacity declined in self-image scores.

The present study agrees with the findings of Sidney and Shephard although precise measurements of aerobic capacity were not taken. In this study, the length of time an individual was able to maintain vigorous hopping, marching, and jumping, served as an indirect measure of increased aerobic capacity. Participants lengthened the time spent in aerobic activities from three minutes at the beginning of the study to ten minutes by the conclusion of the program.

The findings of the present study also support the work of Gissal (1981), whose subjects reported positive changes in self-perception after a three-month exercise program. However, these positive changes in self-perception apparently were not related to the morale scores of Gissal's subjects, as there were no significant changes in morale related to the exercise program in her study.

Extenuating circumstances may explain in part the decrease in self-image scores using the McPherson instrument. Of the two negative scores in the exercise group, one woman had been sick for several months prior to the end of the study, which may have lowered her self-image. The other woman was older (83), somewhat incapacitated with arthritis, and often complained of being lonely.

The exercise program appeared to have a beneficial effect on self-image. The McPherson tool is easily administered and straightforward in the scoring procedure. It was specifically designed to measure the changes that occur in people's feelings and attitudes about themselves.
after an exercise program. As such, it appears to be a useful tool for examining changes in self-image related to exercise.

**Body image.** The body image section of Kenyon's "Attitudes Toward Physical Activity" (1968) was used to measure changes in body image before and after the two phases of the study. The instrument consists of two parts: "My Body as it Really is" and "My Body as I Would Like it to be." Participants mark a semantic differential scale of items such as ugly vs. beautiful, graceful vs. awkward, healthy vs. sick. Responses are scored from 1-7 with the optimal score being 49. The direction of change in scores for all participants in all groups on real and ideal body image is presented in Table 14.

Table 14. Direction of change in body image as measured by Kenyon's attitudes toward physical activity (body image section only)

<table>
<thead>
<tr>
<th>Socialization Group N=6</th>
<th>Exercise Group N=11</th>
<th>Control Group N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2565 + -</td>
<td>2565 - +</td>
<td>7436 n.a.n.a.</td>
</tr>
<tr>
<td>6092 + -</td>
<td>6092 + +</td>
<td>8183 + +</td>
</tr>
<tr>
<td>0644 + n.c.</td>
<td>0644 + -</td>
<td>3936 + +</td>
</tr>
<tr>
<td>9065 + -</td>
<td>9065 - +</td>
<td>3078 n.a. +</td>
</tr>
<tr>
<td>6060 + -</td>
<td>3592 + -</td>
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<td>3173 + -</td>
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<tr>
<td></td>
<td>9226 + +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1134 - n.c.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6079 + -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5182 + +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8168 - -</td>
<td></td>
</tr>
</tbody>
</table>

R. - real body image
I. - ideal body image
n.c. - no change
+ indicates positive change
- indicates negative change
The first component measured was real body image, that is, how the women actually viewed their bodies. The scores of all of the six women in the socialization phase increased in real body image. The scores increased for six of the eleven women (55%) in the exercise group. The scores of the other five women in the exercise program decreased. Of the four women in the control group, scores increased in real body image for two women, and two scores were not available.

Of the six women in the exercise group whose scores improved in real body image, five were faithful in their attendance and worked hard at the exercises. One of the six was younger (66), and lost both weight and inches, which may have contributed to an improved body image. In the case of the two most active members of the exercise group (as judged by the investigator), body image scores increased substantially more, by 22 points and 11 points respectively, than scores of other participants. This increase in scores supports the evidence in Sidney and Shephard's 1976 study which demonstrated that more frequent and intense training may indeed result in changes in body image. Interestingly, however, the socialization phase seemed more effective than the exercise program in improving scores in real body image; this was an unexpected outcome. Perhaps the women in the exercise group who did not improve in real body image found that, as the exercises became more difficult, their limitations became more evident. These limitations may have negated the satisfaction about their improvements which the women expressed initially.
The second aspect of body image is the ideal, that is, how the women would like their bodies to be. Participants rate their bodies in relation to an ideal which is portrayed as beautiful, graceful, relaxed, healthy, adequate, usual, and clean.

Of the six women in the socialization phase, scores decreased in ideal body image for five of the women (83%), and one score remained the same. In the exercise group of eleven women, only four women's (thirty-six percent) scores decreased; five women's scores increased, and two remained the same. Of the four women in the control group, three scores increased, and one was not available.

The socialization phase appears to have affected the ideal image more favorably than the exercise program. Eighty-three percent of the women in the socialization phase had a better perception of their ideal image after the socialization program. The opposite effect seems to have occurred within the exercise group. After exercise, only four (thirty-six percent) of the women had a better perception of their ideal image.

To obtain a true picture of body image, Sidney and Shephard (1976) maintained that the discrepancy between real and ideal image must be considered. In their study, those people who trained hardest showed a significant improvement in actual body image bringing it closer to the desired image. It was hoped in this study that as the women felt better about their bodies as they really were, scores in real body image would improve, and ideal image scores would remain the same or decrease, thus closing the gap between real and desired body image.
Discrepancy scores were computed for all the women in the study by comparing their real and the ideal body image scores both before and after the program. The discrepancy scores for pre and post-socialization and exercise are presented in Table 15. A small number in the posttest indicates less discrepancy.

Table 15. Differences between real and ideal body image scores before and after the program.

<table>
<thead>
<tr>
<th>Socialization Group N=6</th>
<th>Exercise Group N=11</th>
<th>Control Group N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D. No.</td>
<td>pre</td>
<td>post</td>
</tr>
<tr>
<td>2565</td>
<td>7</td>
<td>1*</td>
</tr>
<tr>
<td>6092</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>0644</td>
<td>13</td>
<td>11*</td>
</tr>
<tr>
<td>9065</td>
<td>17</td>
<td>3*</td>
</tr>
<tr>
<td>6060</td>
<td>11</td>
<td>5*</td>
</tr>
<tr>
<td>3173</td>
<td>6</td>
<td>3*</td>
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</tbody>
</table>

*Indicates less discrepancy between real and ideal body image

Five of the six women in the socialization phase (83%) showed less discrepancy between real and ideal body image after the socialization phase. Although six of the women in the exercise group improved in real body image, only four (36%) of those women demonstrated less discrepancy between real and ideal image. Of the four controls, two women displayed less discrepancy. These results tend to support the
contention that the socialization phase was more effective than the exercise program in improving actual body image as measured by less discrepancy.

The German neurologist, Pick, (Fisher and Cleveland, 1969) maintained that people have an inner spatial image of their bodies which can be altered in a positive manner by physical activity. The findings of the present study do not support Pick's theory. Five of the women in the exercise group showed more discrepancy in body image after the exercise program due to decreases in real body image. It may be that the inner image of some of the exercise participants was not subject to positive change, despite a year-long program designed to make them feel more relaxed, graceful, and healthy. In these five cases, it may be possible that the exercise program actually made the women more aware of things they could not do; thus, the real body image score decreased.

Of the seven women in the exercise group who showed more discrepancy between real and ideal body image after the program, illness, fatigue and being on vacation may have been contributing factors. Two of these women had been ill with flu or bronchitis during the spring months, and three had not attended regularly during the last two months of the program. One woman had a broken leg when she completed the test instruments, and the other woman's responses appeared to have been chosen randomly.

It was expected that as participants increased in their physical abilities, their body image would improve. Thus, the lack of positive effect of the exercise program on body image was surprising. In terms
of real body image alone, the scores of women (55%) in the exercise program improved, and for the five who did not improve, extenuating circumstances may have been responsible. It is also possible that the women simply did not work intensely enough, or the image they had of their bodies was so ingrained that an exercise program was not an effective means of bringing about a change in that image. Perhaps there is an age after which positive physical changes simply cannot outweigh the negative effects of aging.

General Well-being. The well-being instrument was designed by the investigator to measure how often a person experiences a particular feeling about both physical and mental sensations. The direction of change of each participant's score for all groups on the General Well-being Inventory is presented in Table 16.

Table 16. Direction of change in Well-being as measured by Cater's General Well-Being Inventory.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>2565</td>
<td>-</td>
<td>2565</td>
<td>+</td>
<td>7436</td>
<td>-</td>
</tr>
<tr>
<td>6092</td>
<td>+</td>
<td>6092</td>
<td>-</td>
<td>8183</td>
<td>-</td>
</tr>
<tr>
<td>0644</td>
<td>-</td>
<td>0644</td>
<td>+</td>
<td>3936</td>
<td>n.c.</td>
</tr>
<tr>
<td>9065</td>
<td>-</td>
<td>9065</td>
<td>-</td>
<td>3078</td>
<td>-</td>
</tr>
<tr>
<td>6060</td>
<td>+</td>
<td>3592</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3173</td>
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<td>3085</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9226</td>
<td>n.a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1134</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6079</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5182</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8168</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n.a. - not available
n.c. - no change in score
+ indicates positive change
- indicates negative change
During the socialization phase, the scores of two of the four participants (50%) improved in well-being. After the exercise program the scores of six of the eleven women (55%) in the exercise group showed an increase in well-being. The scores of four of the six women in the socialization phase and four of the eleven women in the exercise group did not improve. The scores of three of the four women in the control group did not improve in well-being. The score of the fourth woman in the control group showed no change.

Research by Brunner (1969) indicated that people experience a feeling of well-being after exercise. Participants in the pilot study also made verbal statements which indicated feelings of well-being as a result of exercise. The investigator had expected that as the women increased in feelings of self-esteem and self-image, and as daily tasks became easier to perform, the feeling of general well-being would increase. However, the scores on the General Well-being Inventory did not bear out this contention. Only two women in the socialization phase and six of the eleven participants in the exercise group showed improvement as measured by the well-being inventory. Only one woman scored positively on the instruments measuring self-image, self-esteem, daily tasks performance, and well-being.

Other variables may have affected the results on the well-being instrument. Of the five women in the exercise group who showed a decrease in well-being, one had not attended class for the last two months due to fatigue, one had broken her leg in May 1983, one had been ill with bronchitis, and the other woman had missed the last month of class due to being out of town.
Performance of Daily Tasks

The ability to perform daily tasks such as personal grooming, shopping, and housekeeping has been used as a measure of health (Lawton, 1966). The investigator in this study surmised that a program of exercise would result in increased physical stamina and strength and thus contribute positively to the performance of daily tasks.

The Activities of Daily Living instrument developed by the investigator measured the perception of ease or difficulty with which the participants could perform daily tasks such as washing windows, scrubbing the floor, or carrying groceries. The direction of change in each participant's score for all groups on Cater's "Activities of Daily Living Questionnaire" is presented in Table 17.

Table 17. Direction of change as measured by Cater's Activities of Daily Living Questionnaire.

<table>
<thead>
<tr>
<th>Socialization Group N=6</th>
<th>Exercise Group N=11</th>
<th>Control Group N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2565        +</td>
<td>2565      -</td>
<td>7436      -</td>
</tr>
<tr>
<td>6092        -</td>
<td>6092      +</td>
<td>8183      -</td>
</tr>
<tr>
<td>0644        +</td>
<td>0644      +</td>
<td>3936      -</td>
</tr>
<tr>
<td>9065        -</td>
<td>9065      -</td>
<td>3078      -</td>
</tr>
<tr>
<td>6060        -</td>
<td>3592      +</td>
<td></td>
</tr>
<tr>
<td>3173        +</td>
<td>3085      +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9226      +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1134      -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6079      +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5182      +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8168      -</td>
<td></td>
</tr>
</tbody>
</table>

+ indicates positive change
- indicates negative change
Three of the six women in the socialization phase reported being better able to perform tasks after simply meeting together in a discussion group. Perhaps the social contact improved their mental attitude toward daily tasks; therefore, the chores seemed easier to perform. The scores of seven of the eleven women (64%) in the exercise group improved, presumably as a result of the exercise program, which lends support to the investigator's expectation. Since both phases of the program affected task performance in a positive manner, it may be that socialization programs are as effective as exercise programs. However, the four women in the exercise program who were less able to perform daily tasks after the program had been ill or had dropped out during the last two months of classes.

Assessing changes in daily task performance provided the clearest difference between the control group and the other two phases of the program. None of the women in the control group were more able to perform daily tasks at the end of the year.

Since the concepts of mental health and the performance of daily tasks are closely associated (Lawton, 1967), the investigator expected that those women who improved in the performance of daily tasks would also show an increase in scores in well-being. The scores on the two Cater instruments did not support this contention. None of the socialization group and only four of the eleven women (36%) in the exercise group showed positive changes on both instruments.
Group Comparison

An evaluation of variables studied in relation to socialization and exercise can be made more easily by comparing the proportion of each group that exhibits change in a positive direction. Table 18 lists the percentage of each group that changed in a positive direction on each instrument.

Table 18. Percentage of group changing in positive direction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Socialization N=6</th>
<th>Exercise N=11</th>
<th>Control N=4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-concept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>17%</td>
<td>27%</td>
<td>25%</td>
</tr>
<tr>
<td>Self-image</td>
<td>50%</td>
<td>82%</td>
<td>25%</td>
</tr>
<tr>
<td>Body Image</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real</td>
<td>100%</td>
<td>55%</td>
<td>50%</td>
</tr>
<tr>
<td>Ideal</td>
<td>63%</td>
<td>36%</td>
<td>n.a.</td>
</tr>
<tr>
<td>*Discrep.</td>
<td>83%</td>
<td>36%</td>
<td>50%</td>
</tr>
<tr>
<td>Well-being</td>
<td>34%</td>
<td>55%</td>
<td>0%</td>
</tr>
<tr>
<td>Tasks</td>
<td>50%</td>
<td>64%</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Discrep. indicates the difference between real and ideal image scores. A decrease in discrepancy is a positive change.

n.a. - not available

Scores improved for a larger percentage of the exercise group participants than for either the socialization program or no program at all for four of the seven variables tested. However, it must be remembered that social interaction also occurred within the exercise setting. Undoubtedly, friendships and group support influenced the scores of the women who participated in exercise only. A majority
(fifty-one percent or greater) of the exercise group scored in a positive direction in self-image, real body image, well-being, and task performance. There were extenuating circumstances, such as illness, which may have influenced the decrease in some of the scores for the rest of the group.

Of the six women in the exercise group who improved in real body image scores, only one (17%) also improved in both self-esteem and self-image. This finding is contrary to the results in Sidney and Shephard (1976) who reported positive changes in body image were related to positive changes in self-image. The association between body image and self-esteem was also discussed by other researchers (Folkins and Sime, 1981; Heaps, 1978). During the development of the study, the investigator reasoned that increases in fitness variables would likely produce improvements in the components of self-concept included in the study, especially body image, since the body is the medium for exercise. As stated above, this was not the case.

Sonstroem (1984) discussed the difficulty of demonstrating a causal relationship between improvement in physical fitness and increases in self-concept. He indicated that the association may occur more between the perception of fitness and self-concept than between actual fitness and self-concept. The investigator observed changes in participant flexibility, coordination and endurance. It was assumed that these physical changes would lead to positive changes in the women's perception of their fitness. Such positive changes might be reflected in increases in real body image scores. However, no data were collected to assess changes in perceptions of fitness.
The change in body image scores associated with the socialization experience was unexpected. The investigator had expected body image to be influenced more by physical activity than by group discussion. The literature does not indicate previous research in this area; it is possible that the initial pleasure of interacting socially with others had a positive effect on body image. The fact that self-concept can be influenced by specific pleasurable situations (Sonstroem, 1984), and body image is an element of self-concept, makes this explanation seem reasonable.

The increase in scores in well-being and task performance after the exercise program was expected, and there are extenuating circumstances which may explain why the positive group percentage was not higher. The positive change in task performance scores after the socialization experience was not expected. It was thought that task performance would be related to improvements in physical strength and flexibility which were predicted outcomes of the exercise program. Again, the effects of meeting together may have influenced the results.

Summary

The study did not result in clear answers to the questions raised initially about the effects of an exercise program on a group of senior citizens. After the socialization experience, scores improved in real body image for all of the women in the group. Scores improved in self-image and task performance for half of the socialization group.

There were improvements in scores in self-image, real body image, well-being and task performance for a majority of women in the exercise
program. It may be possible that the positive changes in scores within
the exercise group were influenced by social interaction as well as
exercise. Verbal comments made by the participants and behavioral
changes observed by the investigator indicated more positive effects
than were shown by the changes in scores on the test instruments.

Due to missing data, the changes in the control group in self-
esteem, self-image, and real body image could not be determined. How-
ever, scores in well-being and the performance of daily tasks decreased
for all of the women in the control group.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the effects of a program of regular exercise on selected aspects of mental health and on the perception of performance of daily tasks of a group of seventeen senior citizens. Two aspects of mental health were explored; self-concept and general well-being. Self-concept was comprised of self-esteem, self-image, and body image. In addition to the selected aspects of mental health, the effect of the program on the performance of daily tasks was also examined. Five instruments were used to measure the selected aspects of mental health and the performance of daily tasks. These instruments were as follows: the Rosenberg "Scale of Self-esteem" (1965); "The Real Me" by McPherson (1966); "Attitudes Toward Physical Activity," (the body image section only) by Kenyon (1968); and Cater's "General Well-being Inventory" and "Activities of Daily Living Questionnaire" (1982). The study was composed of three groups: a socialization group of six women; an exercise group of eleven women, four of whom were also in the socialization group; and a control group of four women. The study was organized in two phases: a socialization phase in which group discussions were held for one month; and a ten-month exercise program.
The socialization phase was anticipated to have a minimal effect on self-esteem and self-image, and no effect on general well-being, body image and on the performance of daily tasks. The investigator expected that a regular exercise program would result in improved self-concept and general well-being, and that tasks of daily living would be perceived as easier to perform after the exercise program. A summary of the observations in this study is presented below:

1. There were positive changes in self-image scores for the majority of the participants (65%) after both the socialization phase and the exercise program.

2. The scores in real body image improved and the discrepancy between real and ideal body image scores lessened after meeting together socially.

3. Participation in the exercise program was accompanied by improvements in real body image scores for the majority (55%) of the participants.

4. The well-being scores of 55% of the exercise group improved compared to 34% of the socialization group.

5. Daily tasks were perceived as being easier to perform by 64% of the exercise group, compared to 50% of the socialization group.

6. There did not appear to be an association between the scores in well-being and the performance of daily tasks in either group.

7. The scores on the instruments did not appear to reflect the positive verbal comments of the participants at the end of the study.

Conclusions

This study was not able to provide definitive answers to the questions raised about the benefits of an exercise program for a group of senior citizens. The investigator observed changes in the attitudes and behavior and interactions of the women in this study, implying
that they found the program beneficial, both physically and mentally. However, the data neither supported nor refuted these observations.

The relationship between the value of an exercise program compared to the value of a socialization experience is not clear. Perhaps many older adults lead such isolated lives that simple contact with others enhances their feelings about themselves. Such enhancement would improve their quality of life in ways that may not be measureable by current test instruments. This study failed to demonstrate if social interaction or exercise made a significant difference in mental health and task performance. Yet, it seems clear that programs which include both socialization and exercise components can be beneficial for the elderly population. Further study is necessary regarding specific content of such programs.

Recommendations

There are several areas of future study suggested by this investigation. Replication of the study with a larger number of participants may establish differences in outcomes between socialization and exercise programs. The study should be replicated with different instruments in the hope of obtaining more valid tools to assess self-concept and well-being with this age group. The results of the present study suggest that age may be a factor influencing the effect of an exercise program. If the participants were grouped by age, for example, 60-69, 70-79, 80+, the effect of age on the variables could be determined.
The study should be redesigned on a longitudinal basis to follow selected groups of individuals for ten years or longer in order to ascertain the effects of an active lifestyle on the quality of life and the need for health care services. A longitudinal study of people currently in their 30s and 40s who are regular exercisers compared with peers who are not, could assess the differences in health care needs between the two groups over the course of their lifetimes.

As health care costs rise, the effect of exercise programs as they relate to the need for health care services could help in policy reform in governmental and private agencies. Such a study should examine the relationship between exercise programs and the demand for home health aides, "Meals on Wheels," physician time, and hospitalization.

Summary

The investigator believes that both the socialization and exercise programs were beneficial for the participants. From the investigator's perspective, the participating women were happier and less lonely, and the quality of their lives was improved by participating in the program. The interaction among the women, their continuing relationship with the investigator, and their friendship with one another, all support the theory that programs such as this can make a positive difference in the lives of our elderly population.
Aging in America - Trials and Triumphs. Research and Forecasts Inc. 

Barry, A.; Daly, James; Pruett, Esther; Steinmentz, John; Page, Henry; Birkhead, Newton; and Rodahl, Kaare. "The Effects of Physical Conditioning on Older Individuals. I. Work Capacity, Circulatory, Respiratory Function and Work Electrocardiogram." Journal of Gerontology, 21, No. 2 (1966), 182-91.


Gough, H. "The Adjective Check List as a Personality Assessment Research Technique." Psychological Reports, 6-7, (1900), 107-122.


Morgan, W. "Anxiety Reduction Following Acute Physical Activity." Psychiatric Annals, 9, No. 3 (March 1979), 36-45.


APPENDICES
APPENDIX A

FORMS
TO BE COMPLETED BY PHYSICIAN

NAME ___________________________

1. WHEN DID INDIVIDUAL HAVE LAST MEDICAL EXAMINATION? ___________________________

2. ARE THERE ANY EXERCISES OR PHYSICAL ACTIVITIES WHICH ARE CONTRA-
   INDICATED FOR THIS INDIVIDUAL ________________________________

3. IS THERE ANY OTHER MEDICAL DATA, MEDICATIONS OR ABNORMALITIES IN THIS
   PERSON'S MEDICAL HISTORY WHICH SHOULD BE CONSIDERED IN DEVELOPING AN
   EXERCISE PROGRAM? __________________________________________

4. SPECIFIC EXERCISE PRESCRIPTION (heart rate, work load, duration)
   ________________________________

I certify that the individual whose name appears above may participate in
a supervised Senior Exercise Program, taking into consideration the above
mentioned restrictions.

DATE ___________________________               M.D.

Address: _______________________________________

Phone: _________________________________________
LIABILITY AND RESPONSIBILITY RELEASE

I, the undersigned, being mindful of my own age, health, and physical condition, am voluntarily participating in the Senior Exercise Program. Therefore, I hereby release Amanda Cater, and Montana State University and its representatives from liability for accident, injury, or illness which I may incur as a result of participation in the program, and I hereby assume these risks.

I have been informed of the general description of the project, its purpose and benefits, and have been given an explanation of my involvement and the risks. I understand that I may withdraw from the study at any time.

Witness ___________________________ Participant Signature ___________________________

Date ___________________________
FITNESS HEALTH SURVEY QUESTIONNAIRE

DATE _________________________

NAME _________________________________________

ADDRESS __________________________________________ PHONE ______________

AGE _______ HEIGHT _______ WEIGHT _______________

SELF-RATED HEALTH EXCELLENT _____ GOOD _____ FAIR _____ POOR ___

PAST HISTORY: PRESENT CONDITION:

HAVE YOU EVER HAD? DO YOU NOW HAVE?

HIGH BLOOD PRESSURE _____ HIGH BLOOD PRESSURE _____

ANY HEART TROUBLE _____ HEART TROUBLE _____

BACK PROBLEMS OR INJURIES _____ BACK PROBLEMS _____

ARTHRITIS _____ JOINT PROBLEMS _____

DIABETES _____ DIABETES _____

MUSCLE CRAMPS _____

DO YOU SMOKE? _____ HOW MUCH _____

ARE YOU TAKING ANY MEDICATIONS? _____ WHAT? _______________________

ARE YOU DIETING? _______________________

EXERCISE HISTORY:

DO YOU EXERCISE REGULARLY? _____ WHAT KIND OF ACTIVITY? ______________________

WERE YOU AN ATHLETE IN SCHOOL? _____ WHAT SPORT? ______________________
PERSONAL PROGRESS CHART

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Beg.</th>
<th>3 Mos.</th>
<th>6 Mos.</th>
<th>9 Mos.</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toe touch (standing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Head rotation R.</td>
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<tr>
<td>Side Bend</td>
<td></td>
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<tr>
<td>Knee to Chest (standing)</td>
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<td></td>
</tr>
<tr>
<td>Stand on one foot</td>
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<tr>
<td>Tree</td>
<td></td>
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<tr>
<td>Quadriceps Stretch</td>
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<tr>
<td>Balance (eyes closed)</td>
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<tr>
<td>Aerobics</td>
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<tr>
<td>Hamstring Stretch (heel up, lying down)</td>
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<tr>
<td>Nose to Knee (seated, legs straight)</td>
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<tr>
<td>Nose to Knee (lying down, leg bent)</td>
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<tr>
<td>Back Roll</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Kneeling Push Up</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Walking</td>
<td></td>
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<tr>
<td>Stairs</td>
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<tr>
<td>Body Measurements</td>
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<tr>
<td>Bust</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Waist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hips</td>
<td></td>
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<tr>
<td>Thighs</td>
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<tr>
<td>Resting Heart Rate</td>
<td></td>
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<td></td>
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<tr>
<td>Blood Pressure</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
SOCIAL SECURITY NUMBER ____________________

HAVE YOU NOTICED ANY PHYSICAL CHANGES DURING THE PAST YEAR?
PLEASE BE SPECIFIC.

SIZE OR WEIGHT GAIN OR LOSS

_______ INCHES

_______ LBS.

BLOOD PRESSURE

_______ BEFORE

_______ AT PRESENT

APPETITE _________________

ENERGY LEVEL _________________

SLEEP _________________

OTHER AREAS? _________________

HAVE THERE BEEN ANY LIFE CHANGES IN THE PAST YEAR?

DEATH OF A RELATIVE OR SPOUSE _________________

ILLNESS OF SELF OR RELATIVE _________________
APPENDIX B

EXERCISE PROGRAM
EXERCISE PROGRAM

Beginning Level 1-2 months

*Warm-ups (Seated in chair) 5-10 minutes

Rotation of all joints beginning with neck, shoulders, trunk and progressing to hips, knees, ankles and wrists. Done to slow music with explanation given for each set of movements (why, what muscles or joints, benefits)

*Warm-ups (Standing) 10 minutes

Bend to side back and front (knees relaxed). Arm extended overhead for maximum stretch on side bends, toward floor in front bend.
Calf stretch. Full body circles reaching toward ceiling and sides and floor during circle. One each direction. Lunges to side to stretch inner thigh.

*Balance Activities (Hand on Chair) 5 minutes

Standing on one foot, begin with 15 seconds, increase to 30. Bring one knee up to chest and hold while balancing on other foot. Walk across floor in straight line, heel to toe.

*Leg and Ankles Exercises (also to increase heart rate) 5 minutes

Half knee bend to rhythmic music. Swing arms back and forth. Marching with raising heel only. Marching bringing knees up at right angle to floor.

*Aerobics 3 minutes

Vigorous marching and arm swinging to front, side, and overhead
Jumping in place 5 X
Hopping in place 2-3 X
Walking cool down

*Abdominal and Strength Exercises 10 minutes

Reclining bicycling 10 X
Single Leg lifts (on back) 10 X
Single Leg lifts (on side) 5 X
Knee Ups (Knees up to elbows while lying on back) 10 X
Push Offs Leaning in and out from wall while keeping body straight

Stretching and Relaxation 10-15 minutes

Full body stretch while lying on back
Cross body stretch while lying on back
Knee to Nose
Leg and Hamstring Stretch (Heel toward ceiling)
Lower Back Stretch Reach for toes from sitting position, legs flat
Inner Thigh Stretch Soles together
Neck and Shoulder Rolls Sitting position

*Adapted from Everett Smith & Karl Stoedefalke, Aging and Exercise, 1978.

*Adapted from The Fitness Challenge. President's Council on Physical Fitness & Sports and the Administration on Aging.
Intermediate Level

Seated Warm-ups same as beginning level 5 minutes

Standing Warm ups Beginning plus calf and ankle work standing behind chair.
Five minutes Raise up and down 10 X.

Balance Activities 5 minutes

One foot stand without chair.
Tree position.
Quadriceps Bend Using chair.

Leg and Ankles Exercises 6 minutes
Beginning plus more vigorous arm exercises to develop coordination

Aerobics 6-8 minutes Heart Rate 110-120
Marching
Jumping
Hopping
Jump Rope (no rope)
Heels to Hands
Backward Running (holding on chair)
Side to side (holding on chair)
Walking Cool Down

Abdominals and Leg Exercises 15 minutes

Bicycling Front and Reverse 10 x each
Cross Leg Lifts 10 X
Side Leg Lifts 8 X
Side Leg Lifts with Tuck 8 X
Side Leg Lifts with Heel and Toe 8 X
Knee Ups 15 X
Push Offs or Push Ups 5-8 X

Stretching and Relaxation 10-15 minutes
Beginning plus Back Roll, Side Stretch Seated, Quadriceps (modified)

Advanced Level 6-12 months

Same as Intermediate except:

Aerobics 10 minutes

Jumping Jacks
Can-Can
Forward and Back Jumping
Side to Side Jumping

Abdominals and Leg Exercise Add:
Kneeling Leg Lifts to Back and Side
Front to Back Swing
Knee Ups 20-25 X

Stretching Add:

Head Drop
Cobra
APPENDIX C

ROSENBERG SCALE OF SELF-ESTEEM
ROSENBERG SELF-ESTEEM SCALE

Please respond to each item by circling one of the four numbers.

<table>
<thead>
<tr>
<th>STRONGLY AGREE</th>
<th>AGREE</th>
<th>DISAGREE</th>
<th>STRONGLY DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

For example, if you STRONGLY AGREE that "I feel that I'm a person of worth, at least on an equal plane with others", you would circle the number 1 for item 1; if you STRONGLY DISAGREE with this statement you would circle the number 4.

1. I feel that I'm a person of worth, at least on an equal plane with others.
   1 2 3 4

2. I feel that I have a number of good qualities.
   1 2 3 4

3. All in all, I am inclined to feel that I am a failure.
   1 2 3 4

4. I am able to do things as well as most people.
   1 2 3 4

5. I feel that I do not have much to be proud of.
   1 2 3 4

6. I take a positive attitude toward myself.
   1 2 3 4

7. On the whole, I am satisfied with myself.
   1 2 3 4

8. I wish I could have more respect for myself.
   1 2 3 4

9. I certainly feel useless at times.
   1 2 3 4

10. At times I think I am no good at all.
    1 2 3 4
ME AS I TYPICALLY AM - THE REAL ME

Instructions

The purpose of this study is to measure feelings and attitudes people have about themselves. To do this, you are asked to judge concepts or statements about yourself against a series of descriptive scales. In taking this test, please make your judgments on the basis of your own feelings and attitudes. At the top of each page of this booklet is a statement or concept about yourself to be judged or described. Beneath each concept is a series of scales. You are to rate the concept on each of the scales in order.

Here is how you are to use the scales. If you feel that the concept at the top of the page is very closely related to one end of the scale, you should place your check-mark as follows:

    good __X___:____:____:____:____:____:______ bad
    or
    good ____:____:____:____:____:____:____: __X__ bad

If you feel that the concept is quite closely related to one or the other end of the scale (but not extremely), you should place your check-mark as follows:

    strong ___:_X___:____:____:____:____:____ weak
    or
    strong ___:____:____:____:____:____:____:__X__ weak

If the concept seems only slightly related to one side as opposed to the other side (but not really neutral), then you should check as follows:

    active _____:____:____:____:____:____:____:__X__ passive
    or
    active _____:_____:____:____:____:____:____:_X___ passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seems most characteristic or true of the concept you are rating.
<table>
<thead>
<tr>
<th>contented</th>
<th>dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>discouraged</td>
<td>hopeful</td>
</tr>
<tr>
<td>quarrelsome</td>
<td>amiable</td>
</tr>
<tr>
<td>leisurely</td>
<td>hurried</td>
</tr>
<tr>
<td>pessimistic</td>
<td>optimistic</td>
</tr>
<tr>
<td>graceful</td>
<td>awkward</td>
</tr>
<tr>
<td>successful</td>
<td>unsuccessful</td>
</tr>
<tr>
<td>important</td>
<td>unimportant</td>
</tr>
<tr>
<td>tenacious</td>
<td>yielding</td>
</tr>
<tr>
<td>serious</td>
<td>humorous</td>
</tr>
<tr>
<td>stable</td>
<td>changeable</td>
</tr>
<tr>
<td>youthful</td>
<td>mature</td>
</tr>
<tr>
<td>refreshed</td>
<td>weary</td>
</tr>
<tr>
<td>interesting</td>
<td>boring</td>
</tr>
<tr>
<td>alert</td>
<td>sluggish</td>
</tr>
<tr>
<td>adventurous</td>
<td>cautious</td>
</tr>
<tr>
<td>romantic</td>
<td>unromantic</td>
</tr>
<tr>
<td>impulsive</td>
<td>careful</td>
</tr>
<tr>
<td>fearless</td>
<td>meek</td>
</tr>
<tr>
<td>irritable</td>
<td>patient</td>
</tr>
<tr>
<td>purposeful</td>
<td>drifting</td>
</tr>
<tr>
<td>hard</td>
<td>soft</td>
</tr>
<tr>
<td>aggressive</td>
<td>timid</td>
</tr>
<tr>
<td>unaspiring</td>
<td>ambitious</td>
</tr>
<tr>
<td>angry</td>
<td>good-tempered</td>
</tr>
</tbody>
</table>
ME AS I TYPICALLY AM NOW AS COMPARED TO BEFORE THE EXERCISE COURSE

Instructions

The purpose of this test is to measure how you generally or typically feel now in comparison to how you felt before the exercise course began; that is, the changes in you from then to now. You do this on another series of scales. Here is how you are to use the scales.

(1) more active X:____:____:____:____:____ more passive

or

more active ___:___:___:___:___:___ X more passive

An X at one of the above points would indicate that you are much more active (or passive, whichever is true for you) now than earlier.

(2) more active ___:___:___:___:___:___ more passive

or

more active ___:___:___:___:___:___ X more passive

The above ratings would mean that you are now somewhat more passive (or active) than earlier.

(3) more active ___:___:X:____:____:____ more passive

or

more active ___:___:___:___:X:____ more passive

These ratings would indicate that you are slightly more active (or passive) than earlier.

(4) more active ___:___:___:X:____:____ more passive

This rating would mean that there is no change—you are no different, in regard to the attribute described by the scale, now than before the exercise course.

Please remember that you are to indicate the degree to which you actually experience a change on one of the attributes. If you cannot notice any change on a particular attribute, your rating should indicate this. Do NOT rate according to how you think you should have changed as a result of the exercise.
APPENDIX E

ATTITUDES TOWARD PHYSICAL ACTIVITY

(BODY IMAGE SECTION ONLY) G. S. KENYON
<table>
<thead>
<tr>
<th>adjective</th>
<th>scale</th>
<th>adjective</th>
</tr>
</thead>
<tbody>
<tr>
<td>relaxed</td>
<td></td>
<td>tense</td>
</tr>
<tr>
<td>ugly</td>
<td></td>
<td>beautiful</td>
</tr>
<tr>
<td>usual</td>
<td></td>
<td>unusual</td>
</tr>
<tr>
<td>sick</td>
<td></td>
<td>healthy</td>
</tr>
<tr>
<td>graceful</td>
<td></td>
<td>awkward</td>
</tr>
<tr>
<td>inadequate</td>
<td></td>
<td>adequate</td>
</tr>
<tr>
<td>rugged</td>
<td></td>
<td>delicate</td>
</tr>
<tr>
<td>clean</td>
<td></td>
<td>dirty</td>
</tr>
<tr>
<td>hard</td>
<td></td>
<td>soft</td>
</tr>
<tr>
<td>short</td>
<td></td>
<td>tall</td>
</tr>
<tr>
<td>light</td>
<td></td>
<td>heavy</td>
</tr>
<tr>
<td>large</td>
<td></td>
<td>small</td>
</tr>
<tr>
<td>masculine</td>
<td></td>
<td>feminine</td>
</tr>
<tr>
<td>feeble</td>
<td></td>
<td>vigorous</td>
</tr>
<tr>
<td>flexible</td>
<td></td>
<td>rigid</td>
</tr>
<tr>
<td>weak</td>
<td></td>
<td>strong</td>
</tr>
<tr>
<td>free</td>
<td></td>
<td>restricted</td>
</tr>
<tr>
<td>persist</td>
<td></td>
<td>letting up</td>
</tr>
<tr>
<td>passive</td>
<td></td>
<td>active</td>
</tr>
<tr>
<td>hot</td>
<td></td>
<td>cold</td>
</tr>
<tr>
<td>excitable</td>
<td></td>
<td>calm</td>
</tr>
<tr>
<td>simple</td>
<td></td>
<td>complex</td>
</tr>
<tr>
<td>fast</td>
<td></td>
<td>slow</td>
</tr>
<tr>
<td>permanent</td>
<td></td>
<td>changeable</td>
</tr>
</tbody>
</table>
MY BODY: AS I WOULD LIKE TO SEE IT

|形容词 | | |
|relaxed | | |
|ugly | | |
|usual | | |
|sick | | |
|graceful | | |
|inadequate | | |
|rugged | | |
|clean | | |
|hard | | |
|short | | |
|light | | |
|large | | |
|masculine | | |
|feeble | | |
|flexible | | |
|weak | | |
|free | | |
|persist | | |
|passive | | |
|hot | | |
|excitable | | |
|simple | | |
|fast | | |
|permanent | | |

tense | beautiful | unusual | healthy | awkward | adequate | delicate | dirty | soft | tall | heavy | small | feminine | vigorous | rigid | strong | restricted | letting up | active | cold | calm | complex | slow | changeable |
APPENDIX F

CATER'S GENERAL WELL-BEING INVENTORY
GENERAL WELL-BEING INVENTORY

Occasionally = 1-2 X per month
Sometimes = 1-2 X per week
Most of the time = 4-5 X per week

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Most of the Time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have lots of energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like the way I look</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like the way I feel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*I sleep soundly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to rest often after activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel tense and anxious</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am tired</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have pain in my joints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I exercise at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*I feel relaxed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*I can move around easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel sluggish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can move quickly if needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*My mind is alert</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can remember things - names, places, phone numbers, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+My health is good</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+I have a good appetite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+I am bored and lonely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+I look forward to each day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scale is scored as follows: Occasionally 0; Sometimes 1; Most 2; Always 3.
(Based on responses of subject in my own exercise classes, and work by

*Brunner
*Gutman
+Preston & Gudiksen
APPENDIX G

CATER'S ACTIVITIES OF DAILY LIVING QUESTIONNAIRE
DAILY LIVING ACTIVITIES QUESTIONNAIRE

This scale is to assess how easily you can do tasks that relate to every day activities. Please circle the number under the category that describes best how easy or difficult a task is for you to do.

<table>
<thead>
<tr>
<th>Housekeeping</th>
<th>Easily</th>
<th>With Slight Difficulty</th>
<th>Much Difficulty</th>
<th>Unable to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>*I can do light housework (sweeping, dusting)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>*I can do heavy work (scrubbing floors, washing windows, shoveling snow, chopping wood)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can carry a basket of wet clothes</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can pick up something from the floor</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can get something from the top shelf of a closet or cupboard</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can carry a bag of groceries (to the car)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gardening</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I can push a lawn mower</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can dig holes or spade the garden</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can hoe and weed</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Aspects</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I can climb a flight of stairs (without exhaustion)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can walk a mile (12 blocks)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I can move quickly (to get out of the way of a car, to catch a bus)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
I can open heavy doors

<table>
<thead>
<tr>
<th>Easily</th>
<th>With Slight Difficulty</th>
<th>Much Difficulty</th>
<th>Unable to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

I can do things requiring balance (climb a step ladder)

<table>
<thead>
<tr>
<th>Easily</th>
<th>With Slight Difficulty</th>
<th>Much Difficulty</th>
<th>Unable to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

I can get in and out of bed, a bathtub, a car

<table>
<thead>
<tr>
<th>Easily</th>
<th>With Slight Difficulty</th>
<th>Much Difficulty</th>
<th>Unable to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

I can do things requiring coordination (games, square dancing, swimming, bike riding)

<table>
<thead>
<tr>
<th>Easily</th>
<th>With Slight Difficulty</th>
<th>Much Difficulty</th>
<th>Unable to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Based on Rosow & Breslau (1966), Lawton and Brody (1969)*
**RAW SCORES - SOCIALIZATION GROUP**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Rosenberg</th>
<th>Well-Being pre</th>
<th>Well-Being post</th>
<th>Daily Living pre</th>
<th>Daily Living post</th>
<th>McPherson pre</th>
<th>McPherson post</th>
<th>R. Body pre</th>
<th>R. Body post</th>
<th>I. Body pre</th>
<th>I. Body post</th>
</tr>
</thead>
<tbody>
<tr>
<td>2565</td>
<td>5</td>
<td>4</td>
<td>51*</td>
<td>53</td>
<td>41*</td>
<td>37*</td>
<td>49</td>
<td>66</td>
<td>39</td>
<td>45</td>
<td>46</td>
</tr>
<tr>
<td>6092</td>
<td>5</td>
<td>6</td>
<td>45</td>
<td>41*</td>
<td>35</td>
<td>30</td>
<td>89</td>
<td>71</td>
<td>35</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>0644</td>
<td>6</td>
<td>6</td>
<td>49</td>
<td>62*</td>
<td>43</td>
<td>44</td>
<td>67</td>
<td>68</td>
<td>35</td>
<td>38</td>
<td>49</td>
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<td>6060</td>
<td>5</td>
<td>5</td>
<td>52</td>
<td>48</td>
<td>48</td>
<td>46</td>
<td>61* n.a.</td>
<td>36</td>
<td>44</td>
<td>47</td>
<td>49</td>
</tr>
<tr>
<td>3173</td>
<td>n.a.</td>
<td>3</td>
<td>44</td>
<td>49</td>
<td>39</td>
<td>44</td>
<td>107</td>
<td>84</td>
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n.a. means scores not available
* means some items not answered

R. Body means Real Body
I. Body means Ideal Body
## RAW SCORES - EXERCISE GROUP

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*means some items not answered
n.a. means scores not available
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Cater, A. C.

The effect of a regular exercise program on ...