This is to certify that the

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REGULAR EXERCISE AS STATED BY
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THE POSITIVE AND NEGATIVE EFFECTS OF REGULAR EXERCISE AS STATED BY A GROUP OF OLDER ADULTS

By
Tania Dee VanDyke

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ABSTRACT
THE POSITIVE AND NEGATIVE EFFECTS OF
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A GROUP OF OLDER ADULTS

By

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A qualitative study using individual subject interviews was undertaken to collect descriptive data about the effects of regular exercise on a group of older adults. Subjects were twelve volunteers, three men and nine women, with a mean age of 74 years, who exercised regularly (at least 30 minutes/twice per week). Subjects were asked two main open-ended questions regarding their perceptions of the positive and negative effects of regular exercise. Subject responses were coded into categories and then further classified into one of ten themes. The results indicated that older adults perceive exercise to have many physical and psychological benefits. The positive effects of exercise greatly outnumbered the negative effects reported by these subjects. The theme of well-being had the most coded subject responses followed by Physical Performance, Health Maintenance/Prevention, Impaired Body Functions, Social Value, Social Interaction, Attachment, Mental Alertness, Lack of Social Value, and Lack of Social Support.

DEDICATION

This thesis is dedicated to the memory of my mother, Carol Ann Lietzke, who died of leukemia four months after I started the graduate program. Her drive, ambition, and strength were always an inspiration to me. Her confidence in me and her encouragement helped me get to the point of entering graduate school. It was my memories of her and her love that helped me through the long struggle of completing this research project. Thank you mom, I love you!

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CHAPTER I

INTRODUCTION

Introduction to the Study

The relationship between the mind and body has been an area of controversy for centuries. During Greek and Roman times, the unitary concept supported a positive relationship between mind and body (Parent & Whall, 1984). Plato, the famous Greek philosopher recognized the interrelationship of mind and body thousands of years ago, as evidenced in his dialogue Timaeus...

> "Avoid exercising either mind or body without the other, and thus preserve an equal and healthy balance between them. So anyone engaged on mathematics or any other strenuous intellectual pursuit should also exercise his body and take part in physical training. By such moderate motion he can reduce to order and system the qualities and constituents that wander through the body"
> (translated by H.D.P. Lee, 1971, p. 117)

In the 16th Century, however, Cartesian dualism was introduced when Descarte postulated that the mind and body are both distinct and separate entities and that one does not affect the other (Hooker, 1978). In the 20th Century, the unitary view of optimal health has re-emerged as current research suggests that a relationship does exist between physical and mental health. For example, Rosenman & Freidman's (1974) studies indicate that physical changes may occur in response to psychological pressure such as in the relationship of hypertension to Type A personality. The reverse relationship also exists, that is, mental or emotional changes may be triggered by bodily responses, such

as depression that accompanies post-myocardial infarction (Gentry & Haney, 1975). The challenge for health care providers is to use this knowledge of mind-body unity to provide therapeutic interventions to improve mental as well as physical health.

The term "Psychosomatic" has provided a conceptual link between mind and body that has greatly expanded treatment strategies in medicine (Selby & Calhoun, 1978). Harris (1973) proposed that a "Somatopsychic" perspective provides a similar framework for causation which can generate hypotheses regarding the effects of exercise. "Somatopsychic rationale for man's involvement in physical activity and sport, in brief, is the theory that bodily activity and function influence his behavior." (Harris, 1973, p. 240).

Physical exercise has become increasingly popular in the past decade as a means of improving and maintaining optimal health. The physiological benefits of regular exercise have been known for a long time and are well documented. Raymond Harris, M.D. (1988) states that "a change from a sedentary to an active lifestyle reduces the risk of coronary artery disease by 33 percent to 50 percent; improves serum fat patterns, heart enzymes, and oxygen transport; and slows the metabolic processes of aging". (pg. 154). Harris (1988) goes on to say that exercise can counteract some of the physiological changes that normally affect the aging body, such as the decline in the maximum oxygen uptake capacity and the increase in body fat content. Exercise can help to control weight, reduce high blood sugar, blood fat, and high blood pressure, and thus can improve such serious chronic illnesses as coronary heart disease, diabetes mellitus, hypertension, and pulmonary diseases (Harris, 1988). "Exercise also prevents or delays osteoporosis

from loss of bone mass, increased bone porosity, and decreased bone thickness" (Harris, 1988, p. 154).

Not only are there physiologic benefits of exercise, there are also psychological ones. "People who exercise regularly report that they feel better, more relaxed and more energetic, and most note that they are better able to cope with everyday problems" (George, 1982, p. 13). The tranquilizing effect of exercise can enhance feelings of well-being, decrease depression, and improve sexual satisfaction (Fuller, 1982).

As the American public becomes aware of the importance of physical activity more and more people have become involved in exercise programs. It has been estimated that there are 10 to 23 million joggers, 15 million serious swimmers, 15 million regular cyclists, and 29 million tennis players (Thomas, 1979). Unfortunately this enthusiasm for exercise is not universal.

Erikson (1978), has stated that the President's Council on Physical Fitness reported that "forty-five percent of all adult Americans do not engage in physical activity for the purpose of exercise. These sedentary Americans tend to be older, less well educated and less affluent than those who do exercise." Very possibly then, it is the elderly segment of the population that is the least likely to engage in physical exercise (Price & Luther, 1980). Harris (1988) reports that only 27 percent of people age 65 and over exercise regularly.

There are many explanations offered for why elderly people do not exercise. A common myth in our society is that older Americans are incapacitated and that most people over 65 are institutionalized

(Ostrow, 1984). However, only about 5 percent of those 65 and older lived in nursing homes in 1985. This percentage increased dramatically with age, ranging from 1 percent for persons 65-74, to 6 percent for persons 75-84 years, and 22 percent for persons 85+ (AARP Profile of Older Americans, 1988). Most Americans under 85 are fully ambulatory and quite capable of participating in programs of physical activity, if guidelines regulating the participation of these older adults in physical activity are carefully followed (Ostrow, 1984).

A historical emphasis on old age as a period of decline and on the frailties of the older person has promoted a sedentary life style among the majority of older adults (Ostrow, 1984). The dominant attitude of North American Society is the belief that at retirement, a person should slow down and enjoy a well-earned rest. The problem is that in order for the older person to enjoy a "well-earned rest" he/she must have good health and the level of health has been shown to be partially determined by the level of physical activity. "Thus, the older individual that follows society's lead into some sort of sedentary bliss may be losing that goal for which he/she has worked all his/her life" (Price & Luther, 1980, p. 517-518).

Walter M. Bortz II, M.D. (1982), is a proponent of the pervasive biological law, "use it or lose it", the application of which he states, has received insufficient attention where the human body is concerned. Bortz (1982) compares the many similarities of the deterioration caused by aging and physical inactivity and concludes that "at least a portion of the changes that are commonly attributed to aging is in reality caused by disuse and, as such, is subject to correction" (p. 1203). Bortz states that medicine has been slow to recognize the benefits of

exercise in a number of disease states. "There is no drug in current or prospective use that holds as much promise for sustained life as a life time program of physical exercise" (Bortz, 1982, p. 1203).

An understanding of the relationships between the declines of the aging process and the effects of activity or exercise is becoming increasingly more important as the "baby boom" of the past is being replaced by the "senior citizen explosion" (Jamy, 1980). The fastest growing age group in the United States is the elderly. The U.S. Census Bureau has predicted that by the year 2000 persons age 65 or older will represent 13 percent of the population and this percentage may climb to 21.8 percent by 2030 (AARP, 1988). The average life expectancy should increase from 73.7 years in 1981 to 79.9 by 2050 (for men an increase from 69.8 to 75.8 and women from 77.5 to 83.6).

It is important to again refer to the idea of mind-body unity and to consider the psychological implications of exercise. "In spite of an aging population, for many, old age in America remains a tragedy. Depression, desolation, and despair mark the lives of many elderly Americans" (Ostrow, 1984, p. 8). More than one-half of the women in this country 65 years or older are widowed and more than one-third live alone. For many older Americans who live on fixed incomes, the ravages of inflation have seriously affected their economic security and vitality. Approximately 32 million persons report limitations of activity due to chronic diseases; this figure represents 15 percent of the non-institutionalized population and 46 percent of persons aged 65 and over (Rice & Feldman, 1983). This loss of health often results in significant psychological reactions such as depression.

Advancing age is characteristically accompanied by multiple personal losses; loss of spouse, friends, and children. For the elderly, losses are more numerous and visible, whereas gains are fewer and less apparent (Goldstein, 1979). This multitude of losses, coupled with the concomitant loss of pride, self-esteem, and self-respect, make older people particularly vulnerable to depression (Ostrow, 1984).

Among children and young adults, evidence suggests participation in physical activity affects both positive and/or negative personality and emotional changes (Ostrow, 1984). For example, Vezina and Ruegger (1980) in their study of the psychological effects of running state that, "the evidence so far suggests that running regularly can facilitate positive mood changes, increase self-esteem and confidence, stimulate creative thinking, improve integrative functioning, and decrease anxiety" (p. 111). Less is known, however, about the effects of exercise on the mental health of the older adult. Some authors have proposed that participation in exercise provides to older people similar personality and emotional benefits as those that have been acclaimed for younger populations. However, most of these claims have not been substantiated by empirical research studies (Ostrow, 1984).

Purpose

Although there is much evidence to support the benefits of exercise in the general population, the effects of exercise on the elderly population has received little attention in the literature. The U.S. population of people 65 years and older now number over 26 million (Ory, 1984). Because the "Graying of America" promises to continue it is essential that health care providers gain a clearer understanding of the effects of exercise on this segment of the population. The

potential value of exercise as a therapeutic adjunct to the physical and emotional well-being of older adults promises to be a double-barreled gain. Participation in physical activity not only offers improvements in physical fitness, but it also may provide parallel benefits to the mental health of older adults (Ostrow, 1984).

The purpose of this study is to collect descriptive data about the effects of regular exercise on a group of elderly individuals. It is intended that the results of this study will provide data documenting the stated impact of exercise on the lives of older adults. This knowledge can be used by health professionals to implement holistic therapeutic interventions aimed at maintaining and improving the mental and physical health of the older adult. This data may also provide the basis for future research projects in the area of exercise and the elderly.

Research Question

What are the stated positive and negative effects of regular exercise in a group of older adults?

Conceptual Definitions

Older Adults

"Aging, of course, begins with conception. The selection of age 65 for use as the demarcation between middle and old age is an arbitrary one, borrowed from the social legislation of Chancellor Otto von Bismark in Germany in the 1880's" (Butler & Lewis, 1973). Although chronological age is not a true indication of the condition or outlook of an individual, this definition of old age has been adhered to for social purposes. Age 65 is used as the means for determining the point of retirement or the point of eligibility for various services available

to the elderly. Although it is an unreliable indicator of a person's physical and mental status, age 65 is a convenient and widely accepted definition of old age.

For purposes of this study, the older adult will be defined as a person, male or female, 65 years of age or older. To be included in the study the person must be ambulatory; able to speak and understand English; must be involved in a regular exercise program which consists of at least 30 minutes of exercise at least two times per week; and must have completed at least eight weeks of a regular exercise program.

Positive and Negative Effects of Exercise

An effect is "anything brought about by a cause" (Webster's Dictionary, 1971). An effect can also be defined as a result, influence or action. The effects of exercise on a human being are varied and multidimensional. There are physical effects such as lowering of blood pressure, and psychological effects such as improved levels of well-being. Human beings are individuals and therefore respond to exercise in a variety of ways.

Among the positive effects of exercise reported in the elderly are improved cardiovascular and respiratory function, reduced risk of coronary artery disease, decreased body fat, increased lean body mass, better work capacity, greater flexibility, reduced susceptibility to depression, increased self-esteem, and improved quality of life. People of all ages who exercise regularly report that they exercise because it makes them "feel better". However, there is a lack of research based evidence to substantiate the overwhelming claims made by exercise enthusiasts regarding the "feeling better" sensation. This researcher will attempt to clarify the true feelings and responses to exercise by

asking a group of seniors a series of open-ended questions regarding their personal exercise experiences.

Although not as numerous as the positive effects, there are some reported negative effects of exercise. Negative effects are the unpleasant or undesirable side-effects of exercising. For example: muscle aches; fatigue; and injury. Little has been published on the perceive negative effects of exercise. This researcher will ask the study participants about the negative effects, if any, of participating in an exercise program.

Regular Exercise

Exercise can be defined as "an activity for developing the body or mind" (Webster, 1972). Implicit in the definition are the concepts of repetitiveness and training. Exercise may simply be for enjoyment and recreation or it may be for the purpose of physical conditioning. Pardini (1984), describes five essential components of fitness; endurance (cardiovascular and muscular), strength, flexibility, balance, and coordination/agility. To achieve an optimal level of physical fitness requires modification of one's lifestyle to include a regular exercise program.

The type of exercise program that a person should participate in is dependent on his or her health, level of fitness, and interests. Other factors to be considered when establishing an exercise routine are: climate; cost; and access to gyms, pools, and other exercise facilities.

Exercise can be grouped into two main categories: aerobic and low-intensity. Aerobic exercise has come to mean exercise that strengthens the cardiovascular system. Walking, jogging, cycling, skiing, and

swimming are examples of aerobic exercises. A more formal definition of aerobic exercise is: "Exercise vigorous enough to produce a heart rate of 60 to 90 percent of one's maximum and that is performed for 15 to 60 minutes three or four times a week" (Thomas & Rutledge, 19, p. 172).

Low-intensity exercise has little effect on the cardiovascular system, but is helpful in controlling weight and in halting age related bone demineralization, as well as in simply staying active and enjoying life. Examples of low-intensity exercise are: bowling, golfing, and fishing.

For purposes of this study the regular exercise program can be aerobic, low-intensity, or a combination of the two. It can be a group exercise class or an individuals home exercise routine. The regular exercise program must include a minimum of thirty minutes of exercise at least two times per week.

Just as in younger population groups, the level of physical fitness among the elderly varies tremendously, from the wheelchair bound patient to the 70+ year old competitive runner. A wide range of activities similar to those for younger people may be undertaken by older adults with minimal adaptation to suit their preferences and capabilities. In general, rhythmical, large muscle, continuous aerobic activities provide the best exercise for the healthy adult. Activities such as jogging, walking, swimming, skating, bicycling, cross-country skiing, rope skipping, and aerobic dancing are suggested (Clark, 1985). "Overweight, sedentary, or arthritic individuals should choose activities that are non-weight bearing or do not involve the same joints on a continuous daily basis" (Clark, 1985, p. 74). Swimming and water exercise classes are ideal for the arthritic person.

Some people prefer to exercise alone while others desire the social support of others. Most programs can be adjusted for individual or group activity. Participants in organized group activities may motivate the elderly person to continue an exercise program on a regular basis and also may provide opportunities for socialization with peers which is so often lacking in their lives. However, other people prefer the solitude and flexibility of their own personalized exercise routine. It is important for an individual to find a routine that is enjoyable for them and that fits well into their daily routine.

Today a variety of innovative programs are available for older adults. Many YMCA's, community centers, senior citizen centers, and hospitals offer programs designed specifically for the senior citizen. Other often overlooked resources are television exercise programs, video cassettes, books, and records for home.

One of the biggest obstacles to getting the elderly involved in exercise is their attitude. The President's Council on Physical Fitness and Sports conducted a study in 1972 on the attitudes of older citizens toward physical activity and fitness, the findings were as follows:

1. It is believed that the need for physical activity decreases and may actually disappear as individuals age.
2. There is a tendency to exaggerate the risks involved in vigorous physical activity after middle age.
3. The benefits of light, occasional activity are overrated.
4. Older individuals underrate their own abilities and capabilities.

(From Thacker, J. (1982) Physical Fitness. In T.G. Duncan (Ed.), Over 55: A Handbook on Health. Philadelphia, PA: Franklin Institute Press, p. 407-423).

The dominant attitude of North American society is that at retirement a person should slow down and enjoy a well earned rest. In contrast, exercise is now recognized as both a preventative and therapeutic nursing intervention with the goal of maintaining and promoting a person's functional health status (Paillard & Nowak, 1985).

In summary, advancing age should not preclude regular exercise. Indeed, it is just as important for the older adult to engage in a program of physical activity as it is for the younger individual. Many of the physical changes commonly associated with the aging process are, in fact, biological alterations which occur with inactivity and disuse. Therefore, a regular exercise program of physical activity may delay many of these degenerative changes. Physical activity may also improve the older adults psychological image and contribute to improved mental health.

Much more research needs to be done on the psychological as well as the physiological benefits of exercise in the elderly population. Exercise programs specifically for the older adult need to be offered in every community and health professionals must continue to educate and encourage their elderly clients to establish and commit to an exercise program that suits their individual needs.

Assumptions

For purposes of this study the researcher is making the following assumptions:

1. It is assumed that the effective state of the participants is directly related to the exercise program rather than any other events in the participants' life.
2. It is assumed that the open-ended questions used in this study were sensitive enough to elicit the participants complete and honest feelings about their exercise experience.
3. It is assumed that it is possible for an individuals' thoughts and feelings regarding the positive and negative effects of exercise to change over time.

Limitations

The limitations of this study are:

1. The study population was a convenient, small, and select sample rather than random selection. The uncontrolled variables cannot be assumed to be normally distributed, therefore the potential for bias exists.
2. The subjects who agreed to participate in this study may have been different from those who chose not to participate. Therefore, it is possible that the research findings are not representative of the total population of older adults.
3. The research findings may not apply in the same way to various ethnic groups or to those persons who cannot read, write or speak the English language.
4. The subjects were all ambulatory, independent, older adults. Therefore, it is possible the research findings may not apply to older adults who are not ambulatory or who are in dependent living situations.

5. The sample of older adults was drawn from a limited geographic area, therefore, it is possible that the research findings may not apply to older adults from outside the geographic area.
6. Data was obtained from the subjects after at least eight weeks of a regular exercise program. Data may be different if drawn at some other point during the intervention, or the findings may not be sustained long after the intervention.

Overview of the Chapters

The description of this research study has been organized into six chapters. Included in Chapter I is an introduction, purpose of the study, statement of the research question, hypotheses, conceptual definitions, and a statement of the assumptions and limitations of the study.

In Chapter II the conceptual framework is presented. Relationships between the concepts of this study are considered in the context of nursing theory.

In Chapter III a review of the literature is presented which indicates pertinent background information relevant to the problem area of this study. This author will discuss the strengths and limitations of recent research on the topic of exercise and older adults.

In Chapter IV methodologies and procedures are described. Included in this chapter are a description of the population, data collection procedures, a statement on human rights precautions, reliability and validity, operational definitions, the pilot study, and plans for data analysis.

In Chapter V data collected are presented and an analysis of the pertinent data is provided.

In Chapter VI the research findings are summarized, conclusions and recommendations are presented. The relationship of current findings to other research, and the relationship to the conceptual model are discussed. Implications for nursing, and for future research are also included.

CHAPTER II

CONCEPTUAL FRAMEWORK

Overview

In this chapter, a conceptual framework is presented that will provide the basis for exploring the relationships between concepts, examining the research question, and discussing the study findings. The framework will be used as the basis from which nursing implications are derived for clinical practice, education, and research.

The conceptual framework utilized in this study is Martha Rogers' Unitary Human Beings theory of nursing. A conceptual model of man provides a way of looking at life and lays a foundation for further development of significant research and application of the research findings to professional practice (Rogers, 1970).

The majority of the literature on aging supports an entropic view of the aging process. That is, "aging as a uniform winding down process that is closed, one dimensional and in a progressive state of decline" (Katch, 1983, p. 656). In contrast is the negentropic model, or model of negative entropy. The conceptual framework of Martha Rogers utilizes the negentropic theory. Within this theory, aging man is viewed as becoming more complex, increasing in diversity, increasing in heterogeneity, more enriched, not a winding down, but a speeding up (Rogers, 1970). Utilizing Rogers' framework, therefore provides a positive view of the aging process.

Central to Rogers' theoretical model is the construct of Unitary Man which provides a holistic view of man whose interaction with the environment changes his state of being. The concepts of unity and close interaction between man and environment will be explored as Rogers' framework is utilized to address the researchers question in this study: What are the stated positive and negative effects of regular exercise in a group of older adults?

The Building Blocks of Rogerian Theory

Rogers' theory (1970) is based on the concept that man, bounded by space and time, is in constant interaction with the environment. This unidirectional, irreversible life process of man forms the central core of nursing concepts and practice. Rogers' model is composed of five basic concepts: energy fields, open systems, pattern and organization, four-dimensionality, and sentience and thought. A brief definition of each of these concepts and their relationships to nursing follows.

Energy fields constitute the fundamental unit of all living and non-living substance (Rogers, 1980). Just as the cell is the fundamental unit of life in the cell theory, the term "field" is the unifying concept in Roger's model, and energy signifies the dynamic nature of the field. Roger's describes two such energy fields in her model: 1) the human energy field and 2) the environmental energy field. The human field, or unitary man, is described as: "A four-dimensional, negentropic energy field identified by pattern and organization and manifesting characteristics and behaviors that are difference from those of the parts and which cannot be predicted from knowledge of the parts" (Rogers, 1980, p. 332). Environment in Roger's model includes all that is external to unitary man and is defined as: "A four-dimensional,

negentropic energy field encompassing all that outside any given human field (Rogers, 1980, p. 332).

An open system is one that exchanges energy with the environment and all living organisms (Bertalanffy, 1950). According to Roger's (1970) theory "man interacts as an integrated whole with the totality of the environment" (p. 50). In other words both man and environment are open systems that are in dynamic interaction such that each is continually affecting and being affected by the other.

The energy field of conceptually bound man that is coextensive with the universe is open and characterized by pattern and organization (Rogers, 1980). The pattern and organization of the human energy field is continuously changing, continuously repatterning and reorganizing along life's continuum. Human and environmental fields are characteristic of wave patterns that are never steady, but rather become increasingly more complex as the life process evolves (Rogers, 1970). Therefore, an individual's life style and habits develop out of multiple man-environment interactions (Whelton, 1979).

Found-dimensionality is Rogers' (1970) most abstract concept. It is a non-linear domain without spatial or temporal qualities and is characteristic of both the human and environment fields (Katch, 1983). According to Rogers, any given "point in time" is a four-dimensional matrix (length, breadth, depth, and time) and is the "relative present" or "infinite now" for any individual. Past, present, and future are all in the fourth dimension.

Rogers also includes in her description of unitary man the qualities of sentience and thought as positive and integrating forces. She states, "abstraction and imagery, language and thought, sensation

and emotion are fundamental attributes of man's humanness" (Rogers, 1970, p. 67). The depth and scope of man's capacity to feel is what distinguishes him from other animals (Rogers, 1970). "Feelings are field functions and as such encompass the totality of the individual" (Rogers, 1970, p. 69).

The Principles of Homeodynamics

Martha Rogers' (1970) proposed three principles of homeodynamics which are derived from the five building blocks previously mentioned. The principles of homeodynamics postulate a way of perceiving the nature and direction of unitary human development.

Resonancy

The principle of resonancy states that the change in pattern and organization of the human and environmental fields occurs by means of wave phenomena. "The life process in man is a symphony of rhythmical vibrations oscillating at various frequencies" (Rogers, 1970, p. 101).

Helicy

The principle of helicy proposes that the life process is unidirectional, probablistic and goal-directed, man-environment interactions evolve along "a spiralling longitudinal axis bound in the curvature of space-time" (Rogers, 1970, p. 100). Although similarities may exist in the life process, the same experience is never repeated. The concept of negentropic evolution, and the increasing complexity of pattern and organization are characteristics of the principle of helicy.

Integrality

The principle of integrality, formerly titled Complementarity, refers to the constant interaction between human and environmental energy fields. "The mutual and simultaneous interaction of man and

environment is a continuous flow one does not cause the other" (Katch, 1983, p. 658). As open systems, human and environmental fields change together. There is no causality (Katch, 1983, Rogers, 1980).

In sum, the theoretical framework of Martha Rogers provides a positive view of the aging process. The negentropic model of man as ever evolving with increasing complexity from birth to death is a major focus of Rogers' framework. The five basic concepts of Rogers' model are: energy fields, open systems, pattern and organization, four-dimensionality, and sentience and thought. The three principles of homeodynamics; Resonancy, Helicy, and Integrality, postulate the way the life process is and predict the nature of its evolving (Rogers, 1970).

In the next section this author will describe how the Rogers' model was used as a guide for this research. This author will also describe how the geriatric clinical nurse specialist in primary care can use the concepts of Rogers' model to guide his/her practice.

Application of the Model to this Study

In viewing the aging process with respect to Rogers' model, it can be seen that growth and development continue as the person becomes more complex. "Heterogeneity, diversification, and growing complexity are observable attributes of man's unfolding" (Rogers, 1970, p. 55). This is in contrast to the popular myths regarding the inevitability of age-related declines in health and function (Ory, 1984).

Three general propositions on aging have been derived from accumulated research from the behavioral and social sciences that have similarities with Rogers model: "1) Aging is a life long process that is determined by complex, interacting biological and psychosocial processes; 2) Aging is not fixed for all time, but changes as society

changes; and 3) Because aging is not immutable, it is subject to some degree of human intervention and control" (Ory, 1984).

In relation to proposition one, Rogers, in her conceptual framework, states that "the constant interchange of matter and energy between man and environment is at the basis of man's becoming" (1970, p. 54). Proposition two relates to Rogers' theory of negentropy. "The process of life evolves through time and is concomitantly bound in space-time. At any given point in time, man is the expression of the totality of events present at that point in time" (Rogers, 1970, p. 57). And lastly, proposition three, the idea that man has some control over his own aging process, is evidenced in Rogers' theory by her statement..."Man knowingly makes choices. Through awareness of himself and his environment, he is an active participant in determining the patterning of his field and in reorganizing the environment in accord with his desires" (1970, p. 71).

Katch (1983) views the aging process as a manifestation of Rogers' hemodynamic principles of Reasonancy, Helicy, and Integrality. Aging is "a negentropic evolutionary emergence of man" (Katch, 1983, p. 658). The aged move through their developmental stages in continuous interaction with the environment, patterning and repatterning their lives to accommodate the changes that occur with aging. Aging is a process of increased complexities, increased knowledge, and increased intelligence (Rogers, 1970). Environment is defined by Rogers (1980) as "a four-dimensional, negentropic energy field identified by pattern and organization and encompassing all that outside any given human field (p. 332). According to Rogers' model the environment is an open system, it therefore has no boundaries and possesses its own wholeness. "Man and

his environment are coextensive with the universe" (Rogers, 1970, p. 53). Therefore man is affected every day by a multitude of influences from his environment many of which he may be totally unaware of or to which he dismisses as being insignificant (Rogers, 1970).

Figure 1 depicts the application of the study variables to Rogers' conceptual framework. The human and environmental energy fields are pictured as unidirectional and irreversible. The segmented line between the two fields signifies Rogers' principle of integrality, the constant interaction between human and environmental energy fields. Rogers' homeodynamic principle of resonancy is shown in the patterning and repatterning of the human field by means of the symbolic wave phenomenon. Helicy is symbolized in Figure 1 by the spirals surrounding the human and environmental fields - indicating the rhythmical nature of life.

The human energy field in the diagram signifies the aging adult - for purposes of this study as a person, male or female, over the age of 65. There are a number of physiologic and psychosocial changes that are related to the normal aging process. These normal changes of aging impinge on the human field and thus result in repatterning to accommodate these changes.

There is no doubt that there is a deterioration of all physiologic functions with aging. "The work capacity of the average sedentary person declines by 30 percent between the ages of 30 and 70" (Sidney, 1981, p. 131). Figure 1 lists several of the other physiologic changes that are considered a normal part of the aging process. Many researchers believe that disuse or inactivity accounts for many of the changes considered a normal part of aging. Walter M. Bortz II, M.D. has

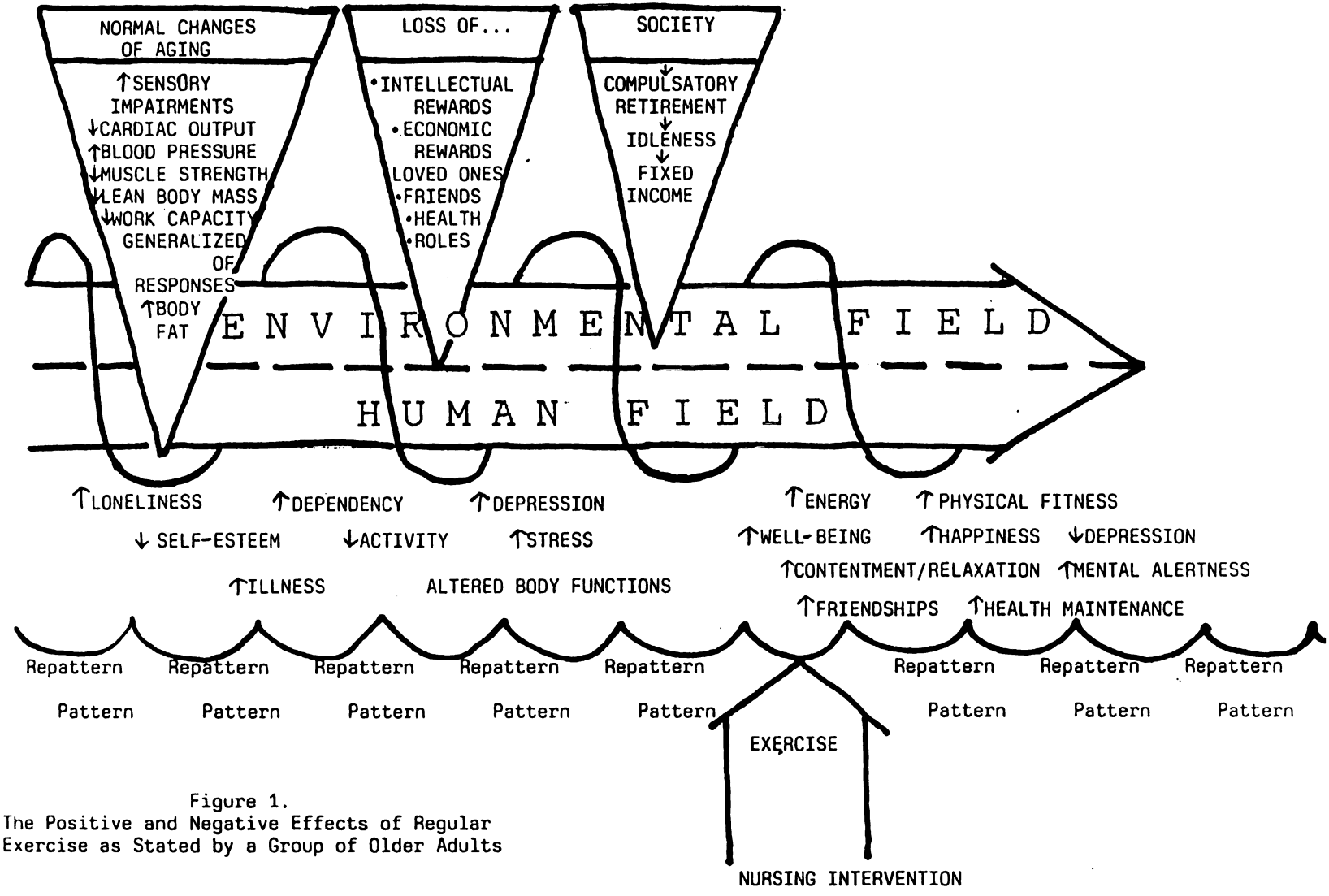

Figure 1.
The Positive and Negative Effects of Regular Exercise as Stated by a Group of Older Adults

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written several articles suggesting that many of the changes commonly attributed to aging is in reality caused by disuse (Bortz, 1980 and 1982). Bortz (1982), compares the changes of aging to the changes that accompany forced inactivity and weightlessness of astronauts in the space program. Bortz (1982) also suggests that the so called "normal changes of aging" can be retarded by an active exercise program.

As the individual ages he or she is in constant, mutual interaction with the environment. Multiple forces from the environment impinge on this individual causing gradual repatterning or adaptation. Society as a whole influences the human energy field. The aged person in the United States is subject to the compulsatory retirement laws, often forcing the older person into a life of idleness. At the same time the elderly person is forced to live on a fixed income and is today faced with a faltering social security system, and inflation. On a more personal level the elderly person is often faced with a multitude of losses. Losses of spouse, friends, and family members are environmental influences that often leave the elderly person alone and depressed. The social environment of North America has fostered the attitude that the older person should slow down, and enjoy a well-earned rest. Significant others in the elderly persons environment will most likely adopt this attitude and insist that the older person become more and more dependent.

The combined effects of society, compulsatory retirement, forced idleness, fixed income, multiple losses, and normal changes of aging result in a repatterning of the human field. In response, the older person becomes less active, increasingly more dependent on others, his

or her sense of self-esteem may decrease, and he or she may become depressed.

Exercise, as applied to Rogers' model of professional nursing is simply a form of organized movements, aimed at promoting symphonic interaction between man and environment, strengthening the integrity of the human energy field, and to initiate repatterning of the human and environmental fields for realization of maximum health potential (Rogers, 1970). This repatterning of fields can be initiated by any man-environment interaction.

An appealing aspect of Rogers' model is that it "has equal relevance whether an individual is deemed to be sick or well" (Rogers, 1970, p. 127). This approach to nursing practice makes Rogers' model easily applicable to the current emphasis on health promotion. As in this study, the older individual need not be deemed "sick" to benefit from the therapeutic intervention of an exercise program. "Nursing intervention is directed toward repatterning of man and environment for more effective fulfillment of life's capabilities" (Rogers, 1970, p. 127). Thus, the use of an exercise program as a therapeutic intervention represents an attempt to treat man as Rogers' views man- "incapable of existing in as encapsulated state of ease or disease, but as existing dynamically along an infinite continuum" (Goldberg & Fitzpatrick, 1980). In Figure 1 the nursing intervention of exercise is depicted as impacting on the system and resulting in a new patterning of the human energy field. The repatterning that follows the exercise intervention is shown as an increase in energy, an increased well-being, a decrease in depression, improved body functions, and improved outlook on life.

Application of the Model to Nursing Practice

Rogers' conceptual framework provides the foundation for nursing practice. According to Rogers (1970) the goal of nursing is to "promote symphonic interaction between man and environment, to strengthen the coherence and integrity of the human field, and to direct and redirect patterning of the human and environmental fields for the realization of maximum health potential" (p. 122).

The Clinical Nurse Specialist views man as holistic. The CNS will develop nursing diagnoses and interventions based on a holistic assessment of the person and his/her environment. This is compatible with Rogers' view of unitary man. Rogers states that the nursing diagnosis encompasses the man-environment relationship and that "nursing intervention is directed toward repatterning of man and environment for more effective fulfillment of life's capabilities" (Rogers, 1970, p. 127).

An important part of the role of the Clinical Nurse Specialist in primary care is health promotion. Within Rogers' framework health and illness are viewed as part of the same continuum rather than dichotomous conditions. Health and illness are responses to human and environmental fields and change along the time-space continuum. "The principle of helicy specifies man's unidirectional, rhythmic complexifying and connotes direction in helping people to achieve positive health" (Rogers, 1970, p. 123). Therefore, the role of the CNS in primary care is to assist people to develop patterns of living in harmony with environmental changes rather than in conflict with them. These goals are set mutually and the client is an integral part of the intervention process. Rogers (1970) states "the practitioner of nursing is an

environmental component for the individual receiving services and is always a factor in the intervention process" (p. 125).

Rogers (1970) believes that "nursing exists to serve people" (p. 122). Nursing practice must respond to the needs and the desires of the public by providing creative and skillful interventions. The Geriatric Clinical Nurse Specialist must respond to the needs of the communities elderly population. Utilizing Rogers' view of negentrophy, the elderly are seen as ever evolving and increasing in complexity. Therefore their needs are unique and the GCNS must treat them individually. As the number of elderly continues to grow and the American obsession with fitness continues, the GCNS is in a position to promote exercise for the older adult and thus impact the quality of life of the elderly.

Summary

Martha Rogers Unitary Human Beings Theory provides a foundation and a perspective on which to base the findings of this study. The entropic view of aging and the unholistic view of man complement the subject of this study, exercise and the older adult, well. The next chapter, Chapter III, is the review of the literature. In Chapter III this author will discuss literature relevant to the concepts of this study; older adult, exercise, and the positive and negative effects of exercise. This author will discuss the strengths and limitations of past research in the areas related to this studies major concepts.

Chapter III

LITERATURE REVIEW

Overview

The literature reviewed in this chapter focuses on the major constructs of this research. The major constructs are: the older adult, regular exercise, and the physiological and psychological effects of exercise in the older adult. Literature is presented that describes the relationships between these constructs.

The Older Adult

In a general sense everyone knows what aging is, yet when it comes to describing and understanding it, no one definition seems quite adequate. The reason for this is that there is no one kind of aging, nor one all encompassing definition of old age.

Webster's Dictionary (1972) defines "old" as "having lived or existed for a long time", and "worn out by age or use". These definitions represent two contrasting views of old age. "Having lived or existed for a long time", (Webster, 1972), implies wisdom and experience. On the other hand, a more negative view of aging is that of being "worn out" (Webster, 1972). The old are commonly viewed as unproductive, unemployable, inflexible, senile, and asexual (Ostrow, 1984). They are labeled as "over the hill", "out to pasture", "down the drain", and "old crocks" (Butler, 1975). These negative connotations toward old age have grown out of misinformation. Many people fear aging

unnecessarily and do not see healthy, satisfying old age as a possibility.

Historically the vast amount of data on aging has reinforced this decremental perspective in which aging is viewed as a period of decline. However, 81 percent of those over 65 are fully ambulatory and only 4 percent are institutionalized (Ostrow, 1984). As the "Graying of America" trend continues it will become increasingly important for the public as well as health care providers to take a more positive approach to the aging population.

"The older population - persons 65 years or older - numbered 29.8 million in 1987. They represented 12.3 percent of the U.S. population, about one in every eight Americans. The number of older Americans increased by 4.3 million or 17 percent since 1980, compared to an increase of 5 percent for the under 65 population (AARP & AoA, 1988).

Based on data from the U.S. Bureau of the Census, it is predicted that the older population will continue to grow in the future. "This growth will slow somewhat during the 1990's because of the relatively small number of babies born during the Great Depression of the 1930's. The most rapid increase is expected between the years 2010 and 2030 when the 'baby boom' generation reaches age 65" (AARP & AoA, 1988).

"By 2030 there will be about 66 million older persons, two and one-half times their number in 1980. If current fertility and immigration levels remain stable, the only age groups to experience significant growth in the next century will be those past age 55" (AARP & AoA, 1988). "By the year 2000, persons 65+ are expected to represent 13 percent of the population, and this percentage may climb to 21.8 percent by 2030" (AARP & AoA, 1988).

Birren and Renner (1977), suggest that a positive and natural view of the aging process when they define aging as "the regular changes that occur in mature genetically representative organisms living under representative environmental conditions as they advance in chronological age" (p.4). A recurrent theme in the gerontological literature (e.g., Butler, 1975; Kalish, 1982; Dychtwald & Flower, 1989) is that older people are more diverse than similar and that with increasing age, there is greater variability in biological and behavioral functioning. Ken Dychtwald (1989) in his book, Age Wave, attempts to dispel the myth that all older people are pretty much the same by stating that "there is no age group more varied in physical abilities, personal styles, tastes and desires, or financial capabilities than the older population" (p. 47). Dychtwald (1989) goes on to say that "people in their later years become more, not less, diverse. And tomorrow's elders will be different not only from one another, but from today's elders as well" (Dychtwald & Flower, 1989, p. 48). A large number of interindividual differences exist among older persons on parameters of personality and psychomotor abilities (Ostrow, 1984). Consequently, chronological age classifications, such as "over 65", are, at best, convenient labels for identifying the old and are of limited use in predicting psychomotor abilities and behavior (Ostrow, 1984).

Gerontologists have attempted to deal with this unreliable concept of "oldness" by subdividing old age into several smaller age groups. Shepard (1978) proposed the following classification scheme which is now used frequently in gerontology literature:

Middle Age: ages 40-65, the preretirement years

Old Age: ages 65-75, the immediate postretirement period when there is relatively minimal functional impairment.

Very Old Age: ages 75-85, some functional impairment but most individuals can still function somewhat independently.

Extreme Old Age: ages 85 and older, greater functional impairment and institutional care is usually needed.

Chronological age classification are convenient labels which help to identify who is old. However, these labels have their limitations. Chronological age classifications do not account for the large cultural variations in the definition of who is old. For example, "old age" in Japan would be defined very differently from "old age" in the United States. The use of age categories also fails to consider the large intraindividual differences in the aging process - that is, individuals do not age at the same rate.

Aging is not something that starts suddenly at age 40, or 50, or 65... it is a continuum that begins at birth. "The aging process is perhaps best summarized as a gradual decline in the ability to adapt to changes in the environment (Barry, 1986, p. 155). The major pathophysiologic changes that occur with aging are:

Cardiovascular

Aging is accompanied by a decline in the maximum cardiac output and the maximum work capacity. In our culture, a rise in systolic blood pressure often occurs, with or without an increase in diastolic blood pressure. The coronary vessels become narrowed with fatty deposits. These losses combined with decreased vital capacity, diminished chest

wall compliance and reduced maximum ventilation, limit the older individual's capacity to maintain a peal level of aerobic fitness (Barry, 1986).

Musculosketal

Beginning as early as the fourth decade, women lose bone at approximately 1 percent per year at menopause, when it accelerates to 2 percent to 4 percent for 4 to 5 years, then returns to about 1 percent. By age 70 the total loss in bone mineral can reach 30 percent. This gradual but continual decrease in mass results in structural weakening and a high risk of spontaneous fracture. Men lose bone mineral at about 0.5 percent per year and are generally not at risk for fracture until they reach their 80's.

The two primary mechanical forces acting on bone are gravity and muscular contractions. Beginning in the middle years, there is a 3 to 5 percent loss of muscle tissue per decade, with the muscles of the legs and trunk especially affected. Loss of muscle tissue is hastened by disuse. "Immobilization, weightlessness or loss of muscle function may dramatically increase the rate of bone loss to as high as 1 percent of the bone mineral content per week" (Barry, 1986, p. 156).

Central Nervous System

Aging is associated with an overall reduction in sensory function. There is slowing of mentation and impairment of motor responses. "Coordination and balance may also be reduced, which may contribute to poor motivation and difficulty in performing even the simplest of tasks" (Barry, 1986, p. 156).

Gerontologists, using a biopsychosocial approach to the aging process, recognizes that being old can be translated into physical

changes, behavioral changes, and changes in social roles. Birren and Renner (1977), have described the broad processes of aging in terms of Biological Age, or the functional capacities of our life-limiting organ systems; Psychological Age, or our functional and adaptive capacities toward environmental stimuli; and Social age, or the roles and habits we exhibit with respect to other members of our community and society. The biological, psychological, and social changes that occur across the life cycle are often discontinuous rather than continuous and diverse rather than uniform (Ostrow, 1984). There are many different rates of aging with the same individual. Thus, our society is often guilty of labeling a person as old based purely on their physical appearance, forgetting that their psychological and social capacities for adaptation and change may be similar to (or more advanced than) people half their age.

In summary then, it can be seen that attempts to define old age and to conveniently categorize people as old have been hampered by the enormous diversity among older people who bring with them a history rich in life experiences. Although no single year defines old age, our society continues to use age 65 as a convenient method of categorizing people as senior citizens. Old age is a very individual matter that must be addressed with a biopsychosocial approach, in which it is recognized that, in spite of loss, growing old can be a time of personal growth and fulfillment.

Regular Exercise

The American public is tremendously interested in exercise. Estimates of the number of adults that participate in regular exercise vary from 20 percent to 70 percent. From a review of eight major studies conducted in North America over the last decade, the U.S. Public

Health Service concluded that fewer than 20 percent of U.S. adults get enough regular exercise to have a positive impact on cardiovascular health, 40 percent exercise intermittently, and 40 percent are entirely sedentary (Stephens, Jacobs, & White, 1985).

While a number of controversies remain, it is generally agreed that exercise exerts a positive impact on many aspects of health. The physiological benefits of exercise are well known and well documented in the literature. In recent years researchers have also been exploring the possible psychological effects of exercise and have indeed, found that exercise not only benefits the physical body but also has psychologic and social implications.

The terms "physical activity", "exercise", and "physical fitness" are terms that describe different concepts. However, these terms are often confused with one another and are sometimes used interchangeably. Caspersen, Powell, & Christenson (1985) wrote a paper that attempted to define and distinguish the terms physical activity, exercise, and physical fitness.

> Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. Physical fitness is a set of attitudes that are either health - or skill related. The degree of

> which people have these attitudes can be measured with specific tests. (Caspersen et al., 1985, p. 126).

The concept under investigation in this study is exercise. Caspersen et al., (1985) defines exercise as "physical activity that is planned, structured, repetitive and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective" (p. 128). Exercise, then, is a subset of physical activity. In other words, all exercise is physical activity, but not all physical activity is exercise. Daily physical activities, such as housework or occupational activities, do constitute physical activity as they are bodily movements produced by skeletal muscles that result in energy expenditure. However, these activities are not necessarily exercise because exercise is planned, structured, repetitive, and are performed with the purpose of improving or maintaining components of physical fitness (Caspersen et al., 1985).

In contrast with physical activity, which is related to the movements that people perform, physical fitness is a set of attributes that people have achieved. The health-related components of physical fitness according to Caspersen et al., (1985) are: cardiorespiratory endurance, muscle strength, muscular endurance, body composition, and flexibility. Just as the amount of physical activity ranges from low to high, so does the level of physical fitness. Operational definitions and methods of measuring components of physical fitness vary with the interests and needs of investigators and evaluators. Measurement techniques vary in cost, precision, accuracy, and availability.

Physiological Effects of Exercise

The body's major physiological response to exercise is an increase in total body oxygen consumption made possible by increases in cardiac output, pulmonary ventilation, and extraction of oxygen from the tissues (Mead & Hartwig, 1981). Greater cardiac output is primarily the result of accelerated heart rate, and, to a lesser extent, of greater stroke volume. About one half of the increased oxygen uptake is due to increasing oxygen extraction by working muscle, with the other half resulting from an augmentation of maximal cardiac output (Mead & Hartwig, 1981).

The efficacy of physical exercise has been summarized by Marini & Schiaffino-Purvis, (1991) (see Table 1).

Table 1.

Effects of Habitual Physical Activity

* Increased maximum oxygen uptake
* Increased cardiac output
* Increased stroke volume
* Decreased heart rate
* Decreased blood pressure
* Increased myocardial vascularization
* Increased capillary density in skeletal muscle
* Increased exercise endurance
* Decreased lactate production
* Increased metabolism
* Increased HDL/LDL ratio
* Increased muscular strength
* Increased endorphin release
* Increased fiber sprouting
* Decreased Platlet aggregation
* Increased glucose tolerance
* Increased bone density
* Increased strengthening of ligaments, tendons, and joints

(Marini & Schiaffino-Purvis (1991). Geriatric Medicine Today, 10(3), 75-79.

Exercise has been shown to modify most risk factors of coronary heart disease (CHD) and may reduce the incidence of myocardial infarction and death from this cause. Regular physical activity protects against CHD through two different mechanisms - improved cardiovascular fitness and improved metabolic fitness (Paffenbarger, 1987). Paffenbarger (1987) states that metabolic fitness is represented by an improved lipid profile or by reduced blood glucose levels. According to Paffenbarger (1987) the results of exercising to the point of cardiovascular benefit are a slower heart rate, lower blood pressure, increased cardiac output, greater physical work capacity, an increased stroke volume, an increased stroke volume, an increased capillary-to-fiber ratio and an enlarged coronary artery bore. Paffenbarger (1987) states that "people who are active and fit have larger coronary vessels than those of sedentary, less fit individuals" (p. 118).

Paffenbarger (1987) goes on to say that exercise enhances metabolic fitness through both physiological and biochemical mechanisms. Exercise lowers blood concentrations of low-density lipoprotein cholesterol (LDL-C), very low-density lipoprotein cholesterol (VLDL-C), and triglycerides, while presumably increasing the levels of high-density lipoprotein cholesterol (HDL-C). "Exercise leads to decreased fibrinolytic activity at rest (but increased activity reduced by vascular occlusion), reduced platlet stickiness, increased insulin sensitivity, and other endocrinologic changes that have direct and indirect bearing on the risk for cardiovascular disease" (Paffenbarger, 1987, p. 119).

Cooper, Pollack, Martin, White, Linneraud, & Jackson (1979), conducted a study to determine if men with higher levels of

cardiorespiratory fitness had lower values in variables related to higher risk of coronary heart disease (CHD). The American Heart Association lists the following as risk factors for CHD: elevated blood pressure, hyperlipidemia (mainly cholesterol and triglycerides), excessive cigarette smoking, obesity, inactivity, hyperglycemia, uric acid, and excessive emotional stress. In Copper et al's., (1976) study nearly 3000 men with an average age of 44.6 years, were examined for blood and lipid profile, pulmonary function, percent body fat, and Balke maximal performance treadmill stress testing with multilead ECG monitoring. Five age-adjusted cardiorespiratory fitness categories were determined from treadmill times. The five fitness levels were: very poor, poor, fair, good, and excellent. Cooper et al., (1976) observed a consistent inverse relationship among physical fitness categories and resting heart rate, body weight, percent body fat, serum levels of cholesterol and triglycerides, glucose, and systolic blood pressure. These results imply that physical fitness is related to lower coronary risk factors, and thus, improving one's levels of cardiorespiratory fitness may be a key factor in reducing mortality form CHD.

Johannessen, Holly, Lui, & Amsterdam (1986) conducted a study of the effects of a high-frequency, moderate-intensity training program in a group of sedentary, middle-aged women. Specifically, Johannessen et al., (1986) examined the effects of a ten-week conditioning program on oxygen consumption, body weight, body composition, and the incidence of orthopedic injury. Their goal was to optimize the training effects without causing excessive orthopedic stress or fatigue. This was a small study (N=15). The women ranged in age from 49 to 62 years (mean age = 54.7 years). Ten women were assigned to the exercise group and

five women served as the control group. The women were tested before and after the ten weeks of exercise. Tests included an ECG-monitored maximal graded exercise test on a treadmill, VO2 Max, body weight, body composition (hydrostatic weighing and skin-fold measurements), and one-day diet histories.

The ten subjects in the exercise group participated in a moderate-intensity program of various aerobic exercises five days a week for ten weeks. The intensity of the conditioning sessions gradually increased over the ten week period. Johannessen et al., (1986) reported that by the end of the ten weeks, relative VO2 Max had increased significantly from 24.6 to 29.3 ml/kg/min in the exercise group, but was unchanged in the control group. Conditioning had no apparent effect on any measure of body composition; body weight, percent body fat, and the sum of four skinfolds increased nonsignificantly in the control group. None of the women experienced an orthopedic problem during the training.

Johannessen et al., (1986) summarized their findings by stating that "a progressive exercise regimen comprising various modes of aerobic training is safe and effective for the beginning exerciser" (p. 102). The five day-per-week conditioning program utilized in this study was effective in increasing aerobic capacity without causing orthopedic injuries. Although this exercise program did not seem to facilitate fat loss within a ten week period, it is possible that if the study had continued for a longer period of time changes in body weight and body composition may have been evident.

Palank & Hargreaves (1990) conducted a study to evaluate the lipoprotein concentrations and risk ratios of male golfers who walked the golf course three times a week compared with those of a control

group who did not play golf or engage in any formal exercise program. Subjects were a randomly selected group of 28 male golfers age 48 to 80 (median age 61). All subjects had followed a sedentary life-style in the four months preceding the study. A control group of 16 men age 38 to 68 (median age 50) was randomly selected. The experimental group played golf approximately three times a week from mid-May to mid-September. They walked the course each time which amounted to 14 miles per week.

Palank & Hargreaves (1990) found that the golfers lost weight (average weight loss was 1.4 Kg), whereas the control group gained weight (average weight gain was 1.6 Kg). Total cholesterol and LDL-C decreased significantly in the golfing group. In the golfing group the HDL-C decreased slightly but the ratios of LDL-C and HDL-C to total cholesterol were improved. The findings of Palank & Hargreaves (1990) study are significant in that 22 million people in the U.S. play golf. Golf has a high rate of compliance and participation by all groups and both sexes and should be encouraged as a form of exercise.

There is ample evidence in the literature to show that a program of regular exercise has a multitude of physiological benefits for the human body (Amundsen, DeVahl & Ellingham, 1989; Agre, Pierce, Raam, McAdams & Smith, 1988; Raab, Agre, McAdams & Smith, 1988). Researchers are now beginning to look at the psychological effects of regular exercise. In the next sections this researcher will review several theoretical frameworks that have been proposed to explain how exercise affects psychological variables and will present a review of the literature on the psychological effects of exercise.

Psychological Effects of Exercise

A Review of Theoretical Frameworks

With the increasing popularity of physical exercise in recent years, researchers have attempted to describe the psychological benefits associated with improved fitness. Physical educators, exercise physiologists, psychologists, rehabilitation counselors, psychiatrists, and physicians have all addressed this issue with some degree of optimism (Folkins & Sime, 1981). The psychological benefits of fitness training, especially jogging, have been propagandized by the popular press.

Research on the psychological effects of exercise have been inhibited by the lack of conceptual links between the body and mind. Four theoretical frameworks have been proposed as possible explanations for how physical activity affects psychological variables. These frameworks are: biochemical, psychoanalytical, behavioral, and metaphysical (meditative). Each of these frameworks will be discussed briefly in the following section.

The biochemical theory is based on the idea that certain substances such as catecholamines, cholesterol, glucose, insulin, corticosteroids, thyroxine, and androgens, undergo substantial change in the body during exercise (Vezina & Ruegger, 1980). These biochemical changes, it is speculated, produce changes in behavior.

A popular current hypothesis is that exercise may indirectly result in the release of enkephalins, which in turn results in a feeling of euphoria (Ransford, 1982). Enkephalin is a subunit of the endorphins whose effects are similar to morphine (endorphin = "morphine within") (Ransford, 1982).

The antidepressant effects of exercise have been hypothesized to be due to improvements in the neurotransmission or norepinephrine, serotonin, or dopamine. Single episodes of exercise increase the transmission, turnover, excretion, or production of these neurotransmitters (Hughes, 1989). The improved mood associated with exercise has also been hypothesized to be due to increases in endogenous opiates (Moore, 1982).

Several **Psychoanalytic theories** have been proposed to explain the psychological benefits of running. Sachs (1979) suggests that running allows for "drive discharge". He refers to Freud's description of the auto-erotic component of "pleasure in movement" and speculates that running can release sexual tension.

Anderson (1979) proposes that running can result in a sense of mastery, which, in turn, increases self-esteem and confidence. Anderson (1979) suggests that "as our world grows more complex, many of the issues that face us are beyond our control". Running, according to Anderson (1979), helps an individual to regain a sense of initiative and power through the expression of mastery drives.

Ransford (1982) also discusses the idea of "mastery" as a possible explanation for the beneficial effects of exercise. Participants in an exercise program often experience a feeling of mastery or accomplishment as they become more physically fit and can, for example, run 5 kilometers instead of just 1 kilometer (Ransford, 1982). "This would certainly have a profound impact on the feelings of helplessness and hopelessness that are such prominent symptoms of depression (Ransford, 1982, p. 5).

Mastery occurs because exercisers readily perceive their improved physical state. Mastery experiences improve the individuals' self-confidence or self-efficacy, which in turn improves their ability to tackle their problems (Hughes, 1984).

The Behavioral theories are represented in a study by Rabkin (1978) as reported in Vezina & Ruegger (1980), runners were asked about their "mood changes" associated with running. The question they were asked was whether running offered them a reward (something pleasant is given), a penalty (something pleasant is taken away), a punishment (something unpleasant is given), or a relief (something unpleasant is taken away). Most runners reported a sense of relief with the elimination of anxiety, tension, and depression.

Glasser (1976) views running as a positive addiction. According to Glasser running can create a "natural high". When done regularly, running can become a positive addiction. Runners who became addicted find that when they stop running, they experience withdrawal symptoms such as discomfort, anxiety, or guilt.

Several behavioral and cognitive processes have been proposed to mediate both the antianxiety and antidepressant effects of exercise. Cognitive diversion has been proposed to mediate the antianxiety and antidepressant effects of exercise because subjects find it difficult to ruminate about their problems when they are exercising (Hughes, 1984).

The **Metaphysical theories** have their roots in the art of meditation. Proponents of the art of meditation report that meditation serves to lessen tension, improve memory and concentration, increase spontaneity and coordination, and heighten one's sense of well-being and self-direction (Coleman, 1976).

Running can parallel the act of meditation. In meditation, the higher level of awareness is achieved by the repetition of a mantra (a word or series of words) (Vezina & Ruegger, 1980). In running it is accomplished through repetition of movement. "After running for about 30 minutes, the conscious mind becomes exhausted, freeing the sub-conscious so that thoughts flow spontaneously. This allows for decreased inhibitions and increased insights into ones own behavior. An experience of mysticism similar to that of meditation is attained" (Vezina & Ruegger, 1980, p. 117).

Serious runners often report experiencing physiological changes that produced altered states of consciousness, which is described by Soloman & Bumpus (1978) as "runner's high" or "peak experience". To achieve the same effect as meditation through running, the run should be slow, and last for approximately one hour, and be done three to four times per week (Soloman & Bumpus, 1978).

In sum, psychologically oriented explanations of the mental health benefits of exercise remain unclear. "The current status of theorizing about the processes that might explain physical fitness training effects can best be described as a potpourri of speculations" (Folkins & Sime, 1981, p. 374). More research is needed in this area to develop an integrated theoretical model that can integrate the various claims of cause and effect.

A Review of the Literature

It has been claimed that mental health in both clinical and nonclinical populations is positively affected by vigorous physical activity. Taylor, Sallis, & Needle (1985) list numerous proposed psychological benefits of exercise. Taylor et al., (1985) states that

exercise results in improvements in: academic performance, assertiveness, confidence, emotional stability, independence, intellectual functioning, internal locus of control, memory, mood, perception, popularity, positive body image, self-control, sexual satisfaction, well-being, and work efficiency. Taylor et al., (1985) go on to state that it has been proposed that exercise decreases: absenteeism at work, alcohol abuse, anger, anxiety, confusion, depression, dysmenorrhea, headaches, hostility, phobias, psychotic behavior, stress response, tension, Type A behavior, and work errors. Many of the studies addressing the psychological effects of exercise have been anecdotal or editorial or have methodological problems that limit their usefulness.

Folkins & Sime (1981) conducted an extensive review of research done on physical fitness training and various psychological variables. Folkins & Sime (1981) summarize their findings by stating that "research suggests that physical fitness training leads to improved mood, self-concept, and work behavior; the evidence is less clear as to its effect on cognitive functioning, although it does appear to bolster performance during and after physical stress" (p. 373). Hughes (1984) also conducted a critical review of published, controlled experiments of the effect of habitual aerobic exercise on mood, personality, and cognition. The results of Hughes (1984) review indicate that exercise improves self-concept but provides little evidence for claims that exercise improves anxiety, depression, body image, personality, or cognition. Hughes (1984) summarizes his findings by stating that "the enthusiastic support of exercise to improve mental health has a limited empirical basis and lacks a well-tested rationale" (p. 76).

Folkins & Sime (1981) reviewed eight studies relating physical fitness and self-concept. Three of these studies utilized the Tennessee Self-Concept Scale (TSCS), each with a different aged population. Hansen & Neddee (1974) used the TSCS with adult females and found improvement in self-concept scores for those who participated in physical fitness training. Hilyer & Mitchell (1979) studied college males and females, and McGowen, Jarman, & Pedeesen (1974) studied a population of seventh-grade males using the TSCS. Both of these researchers showed improvement in self-esteem scores as well.

Two other studies reviewed by Folkins & Sime (1981) utilized the Body Attitude Scale, Semantic Differentials, and Bill's Index of Adjustment and Values to test the relation of physical fitness training and self-concept. Collingwood & Willett (1971) conducted a study with five obese male teenagers between the ages of 13 and 16 years who participated in a three week physical training program to assess the effects of physical training on personal attitudes. The results demonstrated significant increases in positive body attitudes, positive self-attitude, self-acceptance, and significant decreases in real versus ideal self discrepancies, as well as improved fitness performance.

Collingwood (1972) conducted subsequent studies using the same tools as the 1971 study of Collingwood & Willet, but used a population of male rehabilitation clients (N=25) who participated in a four week physical training program which assessed personal attitudes, and physical, intellectual, and emotional behavior as effected by physical training. The findings supported the study by Collingwood & Willet (1971) and demonstrated a significant increase in body attitude, self-attitude,

self-acceptance, and positive physical, intellectual and emotional behavior.

Only two of the eight studies on self-esteem and physical fitness reviewed by Folkins & Sime (1981) showed no improvement in self-esteem. One study by Bruya (1977) which studied fourth graders, used the Piers-Harris Children's Self Concept Scale. The other study which did not show improvement was done with a population of elementary age children by Mauser & Reynolds (1977).

Several studies have been done on the effects of exercise on depression (Brown, Ramirez, & Taub, 1978; Kavanaugh, Shepard, Tuck, & Qureshi, 1977; Griest, Klien, Eischens, Faris, Gurman, & Morgan, 1979). Although none of these were done with an elderly population they do provide evidence of the therapeutic effects of exercise on depression. The study done by Greist and colleagues (1979) is an often cited example of the psychological benefits of exercise. Griest et al., (1979) looked at running as a treatment for depression. A pilot study was done to determine whether running might have beneficial effects for actual patients seeking treatments for neurotic or reactive depression. Patients (13 men and 15 women) were assigned randomly either to running or to one of two kinds of psychotherapy (ten session time-limited or time-unlimited). Entry criteria required that patients be between 18 and 30 years old, have prominent depression as the first target problem, symptom checklist-90 (SCL-90) depression cluster score at the 50th percentile or above, minor depression according to the Research Diagnostic Criteria, and absence of psychosis, significant suicide risk, or need for antidepressant medication.

The running therapy consisted of a 10 week program of running for 30-45 minutes at least three times per week. Outcome comparisons for the three pilot study groups indicated that the running treatment was as effective in alleviating depressive symptoms and target complaints as either the time-limited or time-unlimited psychotherapy treatments. The Depression Symptom Checklist was the tool used. Results on change outcome measures taken at two week intervals for the eight running patients and the sixteen psychotherapy patients showed quite similar results - a general improvement in scores on SCL-90.

Doyne et al., (1988) conducted a study to determine the effectiveness of aerobic and nonaerobic exercise in the treatment of clinical depression in women. Subjects were 40 women, aged 18-35 years, diagnosed as having a major, or minor depressive disorder using the Research Diagnostic Criteria (RDC) (Spritzer, Endicott, & Robbins, 1978). Subjects were randomly assigned to either an 8-week running (aerobic), weight-lifting (non-aerobic), or a wait-list control condition. Depression tools used include the Beck Depression Inventory, Lubin's Depression Adjective Checklist, and the Hamilton Rating Scale for Depression. Fitness level was assessed using submaximal treadmill testing. Subjects were pre-tested with each of these instruments and then re-assessed at mid- and post-treatment, and at 1, 7, and 12 month follow-ups. Doyne et al., (1988) found that results were remarkably consistent across measures, with both exercise conditions significantly reducing depression compared with the wait-list control condition, and generally appearing indistinguishable from each other. These findings indicate that both types of exercise conditions significantly reduce

depression and that these results are not dependent on achieving an aerobic effect.

Hayden, Allen, & Camaione (1986) conducted a study to answer the question, "Does involvement in a physical fitness program lead to improved physiological functioning and subjectively perceived psychological well-being?" Hayden et al., (1986) also added a unique dimension to their study by cross validating the participants subjective responses with information provided by knowledgeable informants. These researchers also attempted to determine if specific physiological changes were predictive of changes in particular aspects of psychological functioning.

The study participants were 40 adults (31 women and 9 men) average age 35.9 years, who had signed up to joint the "Fitness for Life" program. "Fitness for Life" is an aerobic exercise program consisting of a variety of repetitive isorhythmic activities (i.e., running, dancing, etc). Classes met three times weekly for twelve weeks. A nonparticipating control group of 18 women and 7 men who were on the "Fitness for Life" waiting list was included in this study.

Seven physiological measures were obtained at the onset and at the end of the program including: Body composition, blood pressure, cardiac acceleration, number of situps and pushups, grip strength, and the number of aerobic points earned running or dancing. The psychological measures were the State Trait Anxiety Inventory (Spielberger, Gorsuch, & Luchene, 1970), the Beck Depression Inventory (Beck, 1972), and the Organizational Analysis Questionnaire (Roth, 1979). Dimensions included in these tools include: depression, trait anxiety, self-esteem, sickness, absence from work, job satisfaction, efficiency of work

performance, quality of sleep, response to stress, and visits to a physician.

Participants showed significantly greater improvements on these measures when compared with the 25 wait-list control subjects. All indicators of healthier psychological functioning, except depression were corroborated by informants who knew participants well.

Relationships between improved physiological and psychological functioning, however, were nonsignificant. Hayden et al., (1986) concluded that "although involvement in an aerobic exercise program has a direct beneficial impact on psychological well-being, linkages between physiological and psychological changes remain unclear (p. 75).

Simons & Birkimer (1988) conducted a study on the effects of aerobic exercise on mood. They explored several intrasubject variables which might predict the effect of exercise on mood. These possible predictors, according to Simons & Birkimer (1988) were demographic factors, initial mood state, initial score on locus of control and social desirability measures, and a variety of cognitive measures such as beliefs about exercise.

Subjects for this study included 53 adults for the experimental group. All were first-time participants in the Adult Fitness Class. Depending on initial exercise heart rate, health status, and exercise history, experimental subjects were assigned to one of four fitness groups, with the intensity of training varying by group. The four groups, with the number of experimental subjects in each were: jogging (11), walk-jogging (29), brisk walking (9), and mild walking (3). Experimental subjects ranged in age from 23-66 (mean=44.9).

The 75 control subjects were selected through class members who were asked to recruit two friends of the same sex and within five years of their own age. Experimental and control subjects were comparable on all major demographic variables. Each experimental subject underwent a modified Balke physical capacity test. This test measures exercise heart rate during low intensity exercise (two and one-half miles per hour) on a flat treadmill after achievement of a steady rate. Both experimental and control subjects completed the psychological measures. These included the Profile of Mood State (POMS), a modified version of the Nowicki-Strickland Internal-External Control Scale for Adults (ANSIE), and the Marlow-Crowne Social Desirability Scale. The social desirability scale was administered only at the first testing; the other two were administered before, immediately after, and three months after the Adult Fitness Class.

The POMS is a 65-item adjective rating scale which yields scores on six psychological state dimensions. These dimensions are Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor-Activity, Fatigue-Inertia, and Confusion-Bewilderment.

The ANSIE, a commonly used locus of control scale, indicates the degree of personal control people feel over events affecting their lives, with greater internal control generally considered more healthy. In addition to the three published tools mentioned above, Simons & Birkimer (1988) developed several ten-point rating scales to assess cognitive variables, namely beliefs and expectations about current, past, and anticipated physical fitness and mood, as well as motivational factors such as enjoyment of exercise.

The Adult Fitness Class consisted of two 90 minute sessions per week for eight weeks plus laboratory testing before and at the end of the course. Each class included about 15 minutes of warm-up, 15-30 minutes of physical activity according to assigned group, cool-down, and about 30 minutes of class lecture on fitness-related topics. Participants were also encouraged to exercise outside of class.

Results of this study showed significant differential improvement in mood state for the experimental group, in comparison to the control group, from pre-test to both post-test and follow-up. Given confirmation of mood improvement for experimental subjects, Simons & Birkimer (1988) conducted further analysis to find possible predictors of that main effect. They found that the mood improvement effects were due almost entirely to initial mood state, with improvements limited to the most mood-disturbed subjects. Mood improvement could not be predicted by improvement on cardiovascular or other physical indices, by other psychological or demographic ratings, or by beliefs and expectations about physical fitness or about mood state.

In sum, research has shown that exercise does affect various psychological variables. Four theoretical frameworks were presented that attempt to explain how physical activity affects these psychological variables. More research needs to be done on how exercise results in improved mental health.

In the next section the effects of exercise on the older adult are described. Research on the physiological and psychological benefits of exercise for the elderly will be reviewed.

Exercise and the Older Adult

The Physiological Benefits

Increasing attention is being paid to the physiological effects of exercise on the elderly. This may be partly due to the increasing number of elderly persons in our society. As the American society continues to grow older, the need will increase for more information on the effects of exercise on the maintenance and improvement of health and physical fitness in the elderly, and for the development of suitable exercise programs for the older population. In the following section this author will review several studies on the physiological benefits of exercise for the older adult.

In a classic study, Herbert DeVries (1970), examined the physiological responses of older men to 6, 18, and 42 weeks of vigorous physical conditioning. Subjects for DeVries (1970) study were 112 caucasian males aged 52-87 (mean age=69.5). Their exercise regimen included calisthenics, jogging, and either stretching exercises or aquatics at each workout for approximately one hour, three times per week under supervision. All experimental subjects were pretested and 66 were retested at 6 weeks, 26 at 18 weeks, and 8 at 42 weeks on the following parameters: blood pressure, percentage of body fat, resting neuromuscular activation by EMG (relaxation), arm muscle strength, maximal oxygen consumption, 02 pulse at heart rate = 145, pulmonary function, and physical work capacity on the bicycle ergometer.

DeVries (1970) most significant findings were related to oxygen transport capacity. "02 pulse and minute ventilation at heart rate 145 improved by 29.4 percent and 35.2 percent, respectively. Vital capacity improved by 19.6 percent" (DeVries, 1970, p. 335). Significant

improvement was also found in percentage of body fat, physical work capacity, and both systolic and diastolic blood pressure for the large 6-week group (N=66), but statistical significance was not achieved for the smaller group (N=8) which exercised for 42 weeks, although the same trend was observed (DeVries, 1970).

Amundsen, DeVahl, & Ellingham (1989) conducted a study to evaluate the physical training effect of a specific set of calisthenics performed by a supervised group of elderly women. Amundsen et al., (1989) chose calisthenics as the form of exercise because they felt that "given the rapidly increasing number of elderly individuals, the need for inexpensive exercise in this population will continue to expand" (p. 476). Amundsen et al., (1989) went on to say that it was critical for researchers to examine the effectiveness of exercise that can be performed by groups of elderly subjects without the use of expensive equipment, large gymnasiums, or outdoor facilities.

Subjects for this study were 14 women with an average age of 75.7 years. Five women with an average age of 71.8 years served as the control group. The experimental group trained for eight weeks. The physical training consisted of group exercise supervised by a licensed physical therapist. Formal exercise sessions were held twice per week, and subjects were encouraged to exercise with a partner one additional session per week. The 12-step calisthenics program was designed to exercise all major muscle groups of the body. Exercise steps 1-5 were designed to allow a gradual warm-up and to improve local muscle endurance. Exercise steps 6-8 were designed primarily to promote cardiopulmonary endurance and secondarily to improve lower extremity

local muscle endurance. Exercise steps 9-12 were designed primarily to promote flexibility and to provide a supervised "cool-down" period.

Amundsen et al., (1989) used a submaximal GXT test as the measure of cardiopulmonary fitness. The submaximal GXT test used involved a stepping ergometer designed for testing elderly and sedentary subjects. Testing was performed before and after the eight weeks of exercise training.

Amundsen et al., (1989) report that for the experimental group "all physiological variables changed in the direction that indicated a training effect" (p. 480). Significant decreases in submaximal GXT heart rate, systolic blood pressure, and rate-pressure product were observed in the exercise group. Predicted maximal aerobic power increased 12.4 percent in the exercise group. The control group demonstrated significant decreases for submaximal GXT, systolic blood pressure, and rate-pressure product, but not for heart rate. Predicted maximal aerobic power for the control group decreased 3.3 percent. Admundsen et al., (1989) conclude that their calisthenic regimen, which required very little space and no equipment, could be used safely and effectively with elderly subjects.

A group of researchers, Agre, Pierce, Raab, McAdams, & Smith (1988); and Raab, Agre, McAdams, & Smith (1988) from the Department of Rehabilitation Medicine and Preventative Medicine at the University of Wisconsin, conducted two studies on the effects of light resistance and stretching exercise in a group of older adults. The study by Raab et al., (1988) examined the effects of the light resistance and stretching exercise upon flexibility, and the study by Agre et al., (1988) examined its effect on strength.

Agre, Pierce, Raab, McAdams, & Smith (1988) conducted a study to determine the effect of a 25 week light resistance and aerobic exercise program upon arm and leg strength. Subjects were 47 elderly women (age 63 to 88, mean age 71 years). Three groups were formed: nonexercising controls (C, N=12), exercise (EN, N=18), and exercise with light weights on the wrists and ankles (EW, N=17). Subjects exercised for one hour, three times per week. All subjects were pre-tested and post-tested for maximal isokinetic muscle strength using a Cybex II Isokinetic Dynamometer at an angular velocity of 60 degrees per second for elbow flexion and extension, shoulder internal and external rotation, and knee flexion and extension.

These researchers found that the exercise groups (EN + EW) improved significantly ($p < 0.05$) more than the control group in elbow flexion (17%), shoulder internal rotation (14%), shoulder external rotation (9%), and knee flexion (20%). No significant differences were found between those who exercised with weights (EW) and those who exercised without weights (EN).

Agre et al., (1988) conclude that "elderly women can achieve substantial gains in the strength of arm and leg musculature as a result of regular light resistance and aerobic exercise, but that the use of weights on the wrists and ankles for added resistance did not enhance this effect" (p. 273).

In another article by some of the same researchers from the University of Wisconsin, the effects of light resistance and stretching exercise on flexibility was examined. Raab, Agre, McAdams, & Smith (1988) conducted a study using a group of elderly women as subjects (N=46) age 65 to 89 years. The purpose of this study was to examine the

ability of weighted and nonweighted exercises to increase flexibility in older adults in the hip, shoulder, wrist, ankle, and neck, as measured with a goniometer before and after a 25 week exercise program. Subjects were divided into three groups: a control group who did no exercise (C, N=13), a group who exercised with light weights (EW, N=17), and a group who exercised with no weights (EN, N=16). Subjects participated in an organized exercise program for one hour, three times per week.

Raab et al., (1988) found that subjects who exercised (EN + EW) gained significantly greater range-of-motion in ankle plantar flexion, shoulder flexion, shoulder abduction, and left neck rotation than control subjects. No significant differences were found between groups in hip flexion, right neck rotation, wrist flexion or extension, or ankle dorsiflexion. The only difference between exercise treatments was that the group who exercised without weights (EN) gained significantly more range-of-motion in shoulder abduction than the group that exercised with weights (EW). Raab et al., (1988) explained this difference by stating that "the use of arm weights may have limited shoulder range-of-motion during exercise, resulting in less improvement for shoulder abduction" (p. 268). Raab et al., (1988) conclude that exercise can increase flexibility in healthy older women by improving shoulder flexion and abduction, ankle plantar flexion, and cervical rotation.

A study conducted by two nurses, Gueldner & Spradley, (1988) examined the benefits of outdoor walking for institutionalized elderly individuals. Gueldner & Spradley, (1988) selected the concept of fatigue as the dependent variable for this study because "it is a phenomenon of particular concern to nurses who provide care for fragile

elderly populations, and because it is a universally recognized human experience" (p. 6).

The study sample consisted of 32 ambulatory and mentally alert individuals age 60 to 93. One half of the subjects (group A, N=16) were residents of a nursing home and the other half (group B, N=16) were residents of a retirement village. Subjects in group A were randomly assigned to one of three subgroups: 1) subjects in group A-1 (N=6) participated in the walking protocol, and were pre- and post-tested; 2) subjects in group A-2 (N=5) continued in their usual routines undisturbed except for pre- and post-testing; and 3) group A-3 (N=5) controlling for extraneous variables present within the environment, were post-tested only, with no other participation in the study. Paralleling the protocol for group A, subjects in group B were randomly assigned to one of three subgroups: 1) group B-1 (N=6) walkers; 2) group B-2 (N=5) non-walkers; and 3) group B-3 (N=5) control.

The intervention in this study consisted of a short outdoor walk of standardized length (0.1 mile) along a level, shaded route three times per week for a period of three weeks. The instrument used was the Pearson-Byars Subjective Fatigue Checklist (PBSFC), which is a ten-item, simple measure of self-perceived level of fatigue.

Gueldner & Spradley, (1988) found that the nursing home residents who participated in the walking regimen reported significantly lower ($p=.05$) fatigue scores at the end of three weeks, whereas the nursing home residents in the non-walking group actually reported an increased feeling of fatigue. The pre- and post-treatment perceived fatigue scores of the walking and non-walking groups at the retirement village

did not change appreciably, as might be expected since daily outdoor walking was already a part of their usual routine.

Gueldner & Spradley, (1988) concluded from their study that "outdoor walking constitutes an inexpensive and readily accessible intervention that may enable elderly individuals to live longer and enjoy an improved state of health during their later years.

In sum, there is an increasing amount of scientific evidence supporting the idea that exercise is good for people of all ages - even seniors. In this section several studies were reviewed which dealt with the physiological benefits of exercise for the older adult, such as cardiovascular fitness, strength, flexibility, and decreased fatigue. In the final section of this chapter studies dealing with the psychological benefits of exercise in the older population will be reviewed.

The Psychological Benefits

Despite the evidence of the relationship between physical activity and improved mental health in the general population, little is known about the impact of activity on the mental health of the older adult. Anecdotal evidence has lead some writers to conclude that participation provides to older people similar personality and emotional benefits that have been acclaimed for younger populations. "Some of these claims are based more on armchair philosophizing than on carefully conducted empirical studies" (Ostrow, 1982, p. 94). There are, however, several studies that do address the psychological effects of physical activity in the older adult. Wright (1977) examined the effects of participation in a 10-week, twice-a-week physical activity program on the self-concept of elderly females (N=90) assigned to either activity or control groups.

The investigator found changes in these individuals' social selves, but not in their personal or physical selves, at the end of the 10-week program. However, it was difficult to determine why changes in the social self were affected because of the variety of physical activities employed (bean bags, balance tasks, etc.) and the limited number of times per week the program was conducted.

Goldberg & Fitzpatrick (1980) examined the effects of participation in a movement therapy group on morale and self-esteem in a population (N=30) of institutionalized aged persons. Participants were randomly divided into an experimental group (N=15) and a control group (N=15). The experimental group participated in movement therapy twice a week for six weeks. Each session lasted approximately 60 minutes and included 30 minutes of activity. The control group subjects participated in the usual treatment program at the nursing home. Instruments used by Goldberg & Fitzpatrick (1980) include the Philadelphia Geriatric Center Morale Scale (PGCMS) and the Rosenberg Self-Esteem Scale.

Goldberg & Fitzpatrick (1980) found that "participants in the movement therapy group demonstrated significant improvement in total morale and attitude toward own aging when compared with the control group, thus providing empirical support for the theoretical and clinical positions postulating a direct relationship between movement therapy and improvements in psychological well-being (p. 344). Changes in self-esteem scores among the experimental group were insufficient to support a statistical difference between groups. However, Goldberg & Fitzpatrick (1980), claim that these findings still have clinical significance. "All subjects began the study with high to moderate levels of self-esteem, lending support to the theory that self-esteem is

more a situationally reactive phenomenon than a direct result of aging" (Goldberg & Fitzpatrick, 1980, p. 345). Possibly the lack of statistically significant findings with regard to self-esteem was a result of the minimal "room for improvement" available (Goldberg & Fitzpatrick, 1980).

Sidney & Shepard (1976) conducted a study with elderly volunteers to examine the effects of a physical training program on the attitudes of elderly men and women towards health and physical activity. The sample consisted of 98 (41 males and 57 females) informed volunteers from a university pre-retirement program, from senior citizen clubs, and from newspaper accounts of the research. The physical training classes were held four days per week for one hour each day, and the session lasted for fourteen weeks. The emphasis of the classes was on fast walking, jogging, and other forms of endurance work.

The instruments that Sidney & Shepard (1976) used were:

1. The Cornell Medical Index-Health Questionnaire
2. A General Information and Health Habit Questionnaire
3. A Manifest Anxiety Scale
4. A Life Satisfaction Index
5. Two assessments of body image - "My body as I would like to see it" and "My body as it really is", and "Me as I typically am, the real me"
6. An Inventory of Attitudes to Physical Activity

After 14 weeks of attending the physical training classes, 83 percent of the subjects in Sidney & Shepard's (1976) study reported improvements in well-being. However, CMI scores were reduced on only one of twelve organic scales and none of the behavior, mood and feeling

scales (Sidney & Shepard, 1976). Naugarten's Life Satisfaction Index, Kenyon's Body Image Scales, and McPherson's the Real Me scores remained unchanged, but there was a decrease of Manifest Anxiety and a greater regard for physical activity as "the relief of tension" (Sidney & Shepard, 1976).

Parent & Whall (1984) conducted a study to determine the relationship between physical activity, self-esteem, and depression in the elderly. They studied a group (N=30) of people 60 years of age and older who were resident of a senior citizen complex and participants at a neighboring senior center. The researchers used the Beck Depression Inventory, the Rosenberg Self-Esteem Scale, and a modified version of the Functional Life Scale. The participants level of physical activity was determined using the modified Functional Life Scale, a thirty-three item scale distributed among four categories: activities of daily living, home activities, and social interaction. This study was done as a survey. Parent & Whall's (1984) findings indicate that there is a relationship between self-esteem and depression. "The physical activities that were most significant and had the greatest impact on the older adult's self-esteem and depression were those activities that involved social interaction and contact with others (Parent & Whall, 1983, p. 82).

Emery (1985) conducted a study with older adults which examined how an exercise program affects cognitive and psychological functioning. Participants were 48 residents of a housing development for older adults. These participants were randomly assigned to either a physical exercise group or to one of two control groups, one of which engaged in social activities, while the second was a waiting-list control group.

All participants were pre- and post-tested before the program began. After 12 weeks of the program, during which time the exercise and the social activity class met three times per week for one hour each day, participants were post-tested. The measures at each time of testing encompassed physiological well-being. The psychological measures included the Center for Epidemiological Studies Depression Scale (CES-D).

Emery (1985) reported that there was a significant Time X group interaction on the measure of depression ($p. < .05$),with the exercise group less depressed at post-test than at pre-test. However, the exercise group began the study more depressed than controls, as indicated by a significant group main effect for depression ($p. < .05$) (Emery, 1985).

DeVries (1981) conducted a study with ten elderly subjects, some as old as 83, and found that they all showed a considerably decreased startle response to an electric stimulus after exercise "tranquilization" than before exercise. The average reduction was 18 percent. DeVries (1981) cautiously concludes that appropriate types, intensities, and duration of exercise can bring about a chronic, as well as immediate, tranquilizing effect in the elderly.

Exercise seems to promote a sense of well-being by improving metabolic processes and by direct "tranquilization" (Fuller, ED., 1982). The tranquilizing effect of exercise may be its most important health benefit and the one we are least likely to give attention. Yet, almost any weekend athlete can attest to it.

Clarkson-Smith & Hartle (1989) conducted a study to examine the relationships between physical exercise and the cognitive abilities of

older adults. Their hypothesis was that the performance of vigorous exercisers would be superior to that of sedentary individuals on measures of reasoning, working memory, and reaction time. Participants were 124 paid volunteers drawn from a sample of 300 men and women aged 55 to 91 who had been recruited for another study. The 62 most active participants were placed in the high-exercise group (minimum of one and one-quarter hours of exercise per week) and the 62 least active participants were placed in the low-exercise group (no more than 10 minutes of strenuous exercise per week).

Participants were tested in two sessions of approximately one an one-half hours each. During the first session an exercise interview was conducted as well as a vocabulary test, measures of working memory, and measures of reaction time. The second session consisted of three written tests of reasoning and the two subjective well-being questionnaires. Multivariate and univariate analyses of variance, with age and education as covariates, indicated that the performance of the exercises was significantly better on measures of reasoning, working memory, and reaction time.

Summary

In sum, the research reviewed here suggests that psychological improvements, such as improved morale and attitude, increased well-being, and decreased depression may be related to an increased activity level. There has been minimal research on the long-term psychological effects of exercise on the elderly. In the future, more research needs to be done on the psychological and cognitive effects of exercise on the elderly. In addition, more research should be done on the underlying

cause for the psychological changes that occur with exercise, such as the biochemical theory.

In the next chapter, Chapter IV, Methodology and Procedure, this author will present the design of this study which was developed to examine the research question discussed in the previous chapters. Chapter IV will provide information regarding the study population, data collection procedures, and data analysis techniques.

CHAPTER IV

METHODOLOGY

Overview

This research study was designed to describe the perceived effects of regular exercise on a group of elderly individuals. A discussion of the methods and procedures employed in this research is presented in this chapter. In the first section a brief discussion of the research design is presented. This is followed by: 1) the criteria for selection of study subjects; 2) identification of study participants; 3) data collection procedures; 4) the procedure for protection of human rights; 5) Reliability and Validity; 6) Operational Definitions of Variables; 7) the sociodemographic instrument; 8) the pilot study; and 9) plans for data analysis.

Problem Statement

The U.S. population of persons over the age of 65 is growing at an unprecedented rate and promises to continue for years to come. If we are to keep our seniors healthy, active, and independent, we must examine the benefits of regular exercise so as to understand its potential as a therapeutic intervention.

Until recently, very little research on the benefits of exercise has been done with older adults. Especially lacking is research on the psychological effects of exercise on the elderly. The purpose of this

study, therefore, is to examine the stated positive and negative effects of exercise in a group of older adults who exercise regularly.

Research Design

A descriptive research approach was chosen to explore the effects of exercise on a group of elderly individuals. Polit & Hungler (1985), define descriptive research as; "research studies that have as their main objective the accurate portrayal of the characteristics of persons, situations, or groups, and the frequency with which certain phenomena occur" (p. 384).

There are distinct advantages to descriptive research. A large amount of data can be collected and a large number of interrelationships can be discovered in a relatively short amount of time (Polit & Hungler, 1985). A descriptive study allows the researcher to collect information from the subjects perspective. "Observations and interviews in natural settings allow the researcher to get close to the ongoing life of persons interacting under normal, everyday social constraints" (Chenitz & Swanson, 1986). The major limitation of a descriptive approach is that it does not allow the researcher to infer cause and effect relationships.

Criteria for Selection of Study Participants

The study participants were a convenience sample of volunteers from South Western Michigan. The criteria for inclusion in the study were as follows:

1. Male or female, 65 years of age or older.
2. Individuals must exercise "regularly". Regular exercise is defined for purposes of this study as exercise that is performed for a minimum of thirty minutes per day, two times

per week. This can be a formal exercise program with an instructor or a personal home exercise routine such as walking, jogging, swimming, bicycling (regular or stationary), rowing machine, calisthenics, or aerobics.

3. Individuals must have been exercising "regularly" for at least eight consecutive weeks prior to participation in this study.
4. Individuals must be able to speak and understand English.
5. Individuals must be ambulatory.

Identification of Study Participants

Potential participants for this study were recruited from the general population through posters and informational flyers circulated in the community. A poster (see Appendix A) describing the study and asking for volunteers was placed at the following locations:

1. Meijers (Grand Haven and Muskegon)
2. D & W (Grand Haven and Muskegon)
3. Lippinks Food Store (Ferrysburg)
4. Grand Haven Senior Center
5. Spring Lake Senior Center
6. YMCA (Grand Haven)

Informational flyers (see Appendix B) and a poster were sent with a cover letter to area senior agencies, congregate mealsites, senior housing sites, and several area churches.

Flyers and a poster were also sent to the coordinator of the Senior Energize program of Mercy Hospital in Muskegon, Michigan. In the cover letter this researcher briefly explained the research study and requested that the instructors of the Senior Energize classes display the poster and distribute the flyers to seniors in their classes.

The flyers had a tearoff section in the bottom where seniors could check "Yes, I am interested in participating in your study. You may contact me by phone". A space was provided for Name and Phone number. Seniors could either call the researcher directly or mail in the tearoff reply section of the flyer. The researcher called individuals who sent replies by mail within three days. During the initial telephone contact the researcher explained the study in detail in the following manner:

1. Introduction of self by name, title, and association as a graduate student in the Nursing program at Michigan State University.
2. An explanation of the study including the purpose of the study, and the criteria for inclusion in the study.
3. An explanation of what is expected of the participant and an indication of the amount of time needed to participate in the study.
4. An assurance of confidentiality.
5. A request for participation in the study.

Potential participants were screened during the initial phone conversation to insure that they met the study criteria. All potential participants were asked the questions on the Screening Tool (see Appendix C). If the individual met the study criteria and agreed to participate in the study, a convenient date and time were set up to visit the person in their home to conduct the interview.

Data Collection Procedures

The data-gathering method chosen for this study was the interview because the concept being examined, positive and negative effects of exercise, required the respondent to explain in his/her own words the

feelings evoked as a result of participation in regular exercise. As stated by Polit & Hungler (1985), "If we want to know how people think, feel, believe or behave, the most direct means of gathering the information is to ask them about it" (p. 182). The interview or self-report method, "frequently yields information that would be difficult, if not impossible, to gather by any other means" (Polit & Hungler, 1985, p. 182). The main objective of the interview was to collect descriptive data on the positive and negative effects of regular exercise in the elderly population.

The interviews took place in the participants home or another mutually agreeable location (two interviews were done at the researchers home). After brief introductions and establishment of rapport, the researcher briefly explained the procedures and interview process. The interviewer informed the participant that the interview would be tape-recorded and that the tapes would be destroyed when the study was complete. The participant's were asked to sign the consent form (see Appendix D). The sociodemographic questionnaire (see Appendix E) was also collected at the beginning of the interview.

The interview guide (see Appendix F) consisted of two open-ended questions. Each question was followed by several probes or examples prepared to help the participant better understand the question. An open-ended format was chosen as it would allow the subjects to answer the questions in his or her own words thus providing richer and more meaningful data.

The subjects were asked to respond as openly and honestly as they could. Ample time was allowed for each question. If at the end of the interview, the researcher noted any discrepancy in the participants

responses, the researcher initiated discussion about the area of discrepancy and tried to clarify those responses. The investigator then stated to the respondent that the interview was complete, and the tape recorder was turned off. The investigator then thanked the respondents for their participation in the study before leaving.

Protection of Human Rights

To assure that the rights of the participants were not violated, specific procedures were followed. A consent form was signed by every study participant. The consent form (see Appendix D) included the following:

1. An explanation of the purpose of the research and the procedures to be followed.
2. A statement regarding the risks and benefits involved in participating in this research project.
3. A statement stating that participation in this study is voluntary and that the respondent may withdraw from participation at any time or may refuse to answer any question without penalty.
4. A statement regarding confidentiality.
5. A statement regarding the use of the tape recorder and destroying of the tapes upon completion of the study.
6. A statement regarding the use of the research data and the final research report.

In accordance with Michigan State University College of Nursing requirements, application was made to the University Committee on Research Involving Human Subjects for permission to conduct this

researcher. UCRIHS approval was received on February 19, 1990 (see Appendix G).

Reliability and Validity

In any research the ability of the researcher to demonstrate reliability and validity are important steps in establishing credibility and value of the findings. The concepts of reliability and validity are addressed differently in reference to a qualitative study because the nature and manner of the research process is different than in a quantitative study (Field & Morse, 1985).

Validity

"Validity refers to whether the instrument or scale is quantifying what it claims to" (Shelly, 1984, p. 33). In qualitative research validity refers to the extent to which the research findings represent reality (Field & Morse, 1985). Research literature abounds with definitions and terms relating to the complex issue of validity. For example, there is content validity, criteria-related validity, construct validity, predictive validity, and face validity. Campbell & Stanley (1966) used the simple terms of "internal" and "external" validity to define two major types of validity which encompass most of the other types.

Denzin (1970), applied the issue of internal and external validity to qualitative research. Denzin claims that internal validity is threatened during data collection by the following factors:

Historical factors

Historical factors refers to the history or events that occurred before data collection or those that intervene during data collection. Historical factors that impinge on the phenomena under study affect

internal validity if they are not accounted for an if their impact is not assessed (Chenitz & Swanson, 1986).

Historical factors that could affect the data collection in this study might be other activities that the older adult takes part in for example, a craft class, card group, or volunteer work. It is possible that the older adult could attribute feelings or responses to these other activities to their participation in regular exercise or vice-versa.

Subject maturation

Subject maturation refers to the potential changes in the informant as a result of his/her relationship with the investigator and the research. Qualitative researchers must be aware of the effect that their relationship with informants has on the data and the type of data collected. Denzin (1970) recommends that field notes about researcher-informant relationships be used to examine the document, the effects of maturation, and changes over the course of the study. This factor is not an issue for this study as it was a one time interview.

Subject bias

Subject bias refers to the difference between the kinds of people studied and those not studied (Denzin, 1970). Demographic information can be collected to assess the extent of subject bias.

This study sample was a volunteer sample of older adults from the Grand Haven area. This is predominantly a white, middle and upper-middle class community, therefore, the study population may be biased toward that group.

Subject mortality

Subject mortality refers to those subjects who leave the study for some reason, i.e., death, illness, move, etc. This factor is not applicable to this study as it is a one time interview.

Reactive effects of the researcher

This important factor in qualitative research refers to the ways that the researcher's presence in the scene affects the participants. This may have been a factor in this study as the subjects may have told the researcher what they thought the researcher wanted to hear during the interview.

Changes in the observer

Changes in the observer refers to the extent that the observer is affected by the participants and the scene. It is natural for the researcher to be affected by the interaction with participants. However, it is important to control for these effects by keeping personal notes and recording changes over time.

External validity rests on the generalizability of the observations to other populations (Denzin, 1970). "In grounded theory, external validity rests on internal variety. The greater the range and variation sought through theoretical sampling, the more certain that the data is generalizable to other members of the same class or units as the phenomena under study" (Chenitz & Swanson, 1968, p. 13).

Reliability

The reliability of an instrument according to Polit & Hungler (1985) is the degree of consistency with which it measures the attribute it is supposed to be measuring. Field & Morse (1985), define reliability as "the measure of the extent to which random variation may

have influenced the stability and consistency of the results" (1985, p. 139). "The less variation an instrument produces in repeated measurements of an attribute, the higher its reliability" (Polit & Hungler, 1985, p. 239). Polit & Hungler (1985) give another way of defining the concept of reliability... "An instrument can be said to be reliable if its measures accurately reflect the 'true' measures of the attribute under investigation" (p. 239).

The attributes under investigation in this study were the positive and negative effects of exercise. A measure of reliability would be if the respondents message regarding their feelings about exercise were consistent throughout the interview. That is, there were no conflicting or inconsistent responses to the interview questions. The researcher checked for reliability by reviewing with the subject his/her responses at the end of the interview. The researcher attempted to verify that what the respondent said was actually what he/she meant and what the researcher heard.

An important point regarding reliability is that "the reliability of an instrument is not a property of the instrument, but rather of the instrument when administered to a certain sample under certain conditions" (Polit & Hungler, 1985, p. 240). The interview questions for this study have been developed for use with the elderly therefore, the questions may not be reliable for use with other populations.

Chenitz & Swanson (1986) relate the term reliability with replicability. "Another way of addressing reliability is through replicating the study" (Chenitz & Swanson, 1986, p. 13). Chenitz & Swanson go on to explain that if a study were replicated the exact same results may or may not be generated. In qualitative research the

results are influenced by the researcher's skills, creativity, time, resources, and analytic ability, no two analyses will be exactly alike, because no two researchers are exactly alike (Chenitz & Swanson, 1986). However, if the theory behind a study is applied to a similar situation it should allow the researcher to interpret, understand, and predict phenomena. "The test for reliability in theory is through the use of the theory and its applicability to similar settings and to other types of problems over time (Chenitz & Swanson, 1986, p. 13-14).

Operational Definitions of Variables

Older Adult

For purposes of this study, the older adult was defined as a person, male or female, 65 years of age or older. To participate in this study the individual had to meet all other inclusion criteria as stated earlier in this chapter.

Regular Exercise

For purposes of this study regular exercise was defined as "exercise which is performed for a minimum of thirty minutes per day at least two days per week" It could be any formal exercise class with an instructor such as; "Senior Energize" or "Body Recall", or it could be an individual's own "personal home exercise program." Exercise activities could include walking, jogging, swimming, biking, aerobics, weight lifting, stretching and toning exercises, etc.

Stated Positive and Negative Effects of Exercise

For purposes of this study, the stated positive and negative effects of exercise were all of the thoughts and feelings expressed by study participants during the interview in response to the open-ended questions asked by the researcher. The positive effects were the stated

"benefits" of exercising as perceived by the study participants. The negative effects were the stated undesirable or unpleasant side-effects of exercising as perceived by the study participants.

The Sociodemographic Instrument

The sociodemographic questionnaire (see Appendix E) was designed to elicit descriptive information about the study sample. Sociodemographic data collected through use of this instrument included: sex; age; marital status; racial/ethnic background; education level; occupation and present work status; yearly family income; number of living children; number and relationship of people in household; history of participation in exercise classes and individual physical activities; participation in other social group activities; and current participation in exercise programs and data started. The researcher administered this questionnaire during the home visit prior to the actual interview.

The Pretest

A pretest of the interview process was conducted with one individual who fit the inclusion criteria of this study. The purpose of the pretest was to determine whether the questions were easily understood and if there were any discrepancies between the content of the questions and the respondent's understanding of the questions. Another reason for performing a pretest was to determine how effective the interview questions were in evoking the intended responses.

The pretest was conducted with a 76 year old female who was involved in her own "personal home exercise program". Although she did not attend any formal exercise classes she did most of her exercising at the YMCA. She exercised five times per week. Her exercise program

included walking, jogging, calisthenics, aerobics, biking, stationary biking, and swimming.

The interview was conducted at the subjects home. She had no difficulty completing the sociodemographic questionnaire. The main thing the researcher encountered during the pretest interview was that the probe questions were necessary to elicit the desired information. Limiting the questioning to the two main questions of: 1) What are the positive effects of exercise? and 2) What are the negative effects of exercise? would have provided much less information. This subject was asked each probe question in order of their appearance on the interview guide. All subsequent interviews were done in the same manner. The subjects were first asked "What would you say are the positive effects of exercise?" After allowing ample time to respond to that question, the probe questions regarding positive effects of exercise were asked. Then the subject was asked the second main question: "What would you say are the negative effects of exercise?" followed by the negative probe questions.

No specific problems occurred during the pretest. The subject understood the questions and responded appropriately. No changes were made in the interview guide.

Summary

This descriptive study was designed to examine the positive and negative effects of exercise as stated by a group of older adults. The twelve subjects were a convenience sample of volunteers recruited through posters and informational flyers distributed through the community. Interviews were conducted either in the subjects home or at the researchers home. In this chapter data collection procedures,

protection of human rights, reliability and validity, and the pre-test were also discussed. Next, in Chapter V, the data from this study and an interpretation of the result is presented.

CHAPTER V

DATA PRESENTATION

Overview

In this chapter descriptive data of the study participants, an analysis of the qualitative data obtained through subjective interviews, and a discussion of the researchers interpretation of the results will be presented.

Characteristics of the Sample

The study participants were a convenience sample of volunteers from the Grand Haven/Spring Lake, Michigan area. Interviews were done with twelve subjects (N=12). There were nine women and three men participants with an age range of 66-82 and a mean age of 74 (see Table 2). All twelve of the subjects were Caucasian. Five subjects were married, five were widowed, one was divorced, and one was single (never married). Four of the twelve subjects lived alone, five lived with their spouses, and three either lived with a family member or a family member lived with them in their home. Ten of the twelve subjects had at least a high school education. Four subjects had vocational or technical training beyond high school and two had a college education. Of the two subjects who did not complete high school, one had an eleventh grade education, and one had completed the eighth grade (see Table 3). Income levels of the subjects varied from the $5,000-$10,000

per year range up to the $75,000+ per year range (Table 4 gives a complete breakdown of income categories).

Table 2.
Age of the subjects: (N=12)

Sex	Range	Mean
Male (N=3)	71-78	75
Female (N=9)	66-82	74
Total (N=12)	66-82	74

Table 3.
Education Level of the Subjects: (N=12)

Highest grade completed	Number of subjects
Grade School	2
High School	4
Vocational/Technical School	4
College/University	2

Table 4.
Income Level of the Subjects: (N=12)

Income range for the last year	Number of subjects
$5,000-$10,000	5
$10,000-$15,000	2
$40,000-$45,000	1
$45,000-$50,000	1
$75,000	2
No response	1

The majority of the subjects, eight of the twelve, were retired, three referred to themselves as housewives and one subject continues to work part-time.

When asked to rate their own health status most of the subjects rated their health as average or above and 2 people rated their health as fair (see Table 5). Most of the subjects had at least one chronic illness. The most common were: Hypertension, Arthritis, and Heart Disease. Other chronic illnesses mentioned were: Diabetes, Emphysema, High Cholesterol, and a Pacemaker. Other medical problems mentioned by these subjects were: Heart Attacks, Cancer, and an ulcer (see Table 6).

When asked to describe their current mental/emotional health, ten of the twelve participants stated that it was good or excellent. The other two subjects described their mental/emotional health as fair (see Table 5).

These twelve subjects started exercising for a variety of reasons, such as: to get in shape, to stay in shape, to lose weight, for something to do, or because of a doctor's order. One subject started exercising following by-pass surgery, and one subject started by walking with her husband following his heart attack (see Table 7). Only two of the twelve subjects reported that they had ever been injured as a result of exercising.

Nine of the twelve subjects attend other non-exercise group activities on a regular basis. These activities include; craft groups, card groups, church activities, volunteer work, senior group, bowling, and a current events class (see Table 8).

The remainder of the sociodemographic questionnaire was divided into two sections: Formal Exercise for those who participated in an exercise class with an instructor and Personal Home Exercise Program for those who did their own exercise program. Of the twelve total subjects,

Table 5.
Physical and Emotional Health Status as reported by Subjects: (N=12)

Health Status	Physical Health	Mental/Emotional Health
Fair	2	2
Average	2	0
Good	5	8
Excellent	3	2

Table 6.
Chronic Illnesses & Other Medical Problems as Reported by Subjects: (N=12)

Chronic Illness and Other Medical Problems	Number of Subjects
Hypertension	5
Diabetes Mellitus	1
Arthritis	5
Heart Disease	4
Emphysema	1
High Cholesterol	1
Pace Maker	1
Cancer	1
Heart Attack	3
Ulcer	1

Table 7.

Reasons for Starting an Exercise Program: (N=12)

Reasons	Number of Subjects
Doctor's orders	2
To lose weight	2
Something to do	1
To get in shape	5
Other	4

*(1 person marked three reasons)

Table 8.

Frequency of Non-Exercise Activities: (N=12)

Non-exercise activity	Less than once/month	1-3 x Mo.	1 x Wk.	2-3 x Wk.	4-6 x Wk.	daily
Craft group			1			
Card group		2	2			
Choir/Music						
Church Activities	1	2	3			
Volunteer Work				1		1
Travel group	1					
Senior group		1				
Current events class			1			

nine were involved in formal exercise and three did their own home exercise program.

Formal Exercise

Nine people attended a "formal" exercise program. Of these nine, eight of them participated in the Community Education Senior Swim program held at the YMCA in Grand Haven. These eight subjects attended the swimming class 1-5 times per week in the afternoon for approximately one hour. The subjects estimated the class size from 6 to 30 people (average was 20-25 people). There is a small fee charged for the Community Education swim program at the YMCA but seniors do not have to pay for regular YMCA membership to attend this class. Four of these same eight subjects also participated in other formal exercise groups in addition to the swimming. Two subjects attended Senior Energize, a low impact aerobic exercise class sponsored by Mercy Hospital of Muskegon. One attended a Stretchersize class and one attended the Cardiac Rehabilitation program of North Ottawa Community Hospital of Grand

Haven. Two of these subjects were attending swimming five days per week and Senior Energize three times per week. Therefore, three times per week these two subjects were attending two different classes in one day.

Of these nine "formal" exercisers, the one who did not attend the swimming attended the Cardiac Rehabilitation program at North Ottawa Community Hospital. This subject attended three times per week for one and a half hours.

For the eight subjects who attended the senior swim program, the class activities included walking and jogging in the water, calisthenic-type exercises in the water, and swimming for those who could. The YMCA swim program used music for the exercise activity. The subjects had been attending the swimming for as many as six years (one subject). Three others had been attending for four years, one person for one year, two people for six months, and one for only twelve weeks.

Only one person had attended another exercise class prior to the swimming. That person had attended Senior Energize. Four subjects did (and still do) participate in other individual exercise activities in addition to their class (see Table 9).

Three subjects indicated that they did a "personal home exercise" routine along with their class. Exercises included: walking, chair exercises, biking, stationary biking, swimming, and calisthenics. One person exercised with several other friends in the apartment building where she lived. She was the leader of the small exercise group. This small group of friends exercised twice per week for approximately one half hour and they did not use music for their exercise session.

The other two subjects did the "personal home exercise" program to augment what they were already doing in their classes. One subject

Table 9.

Frequency of Individual Exercise Activities Outside of Formal Class: (N=12)

	Frequency					
Activity	Less than once/month	1-3 x Mo.	1 x Wk.	2-3 x Wk.	4-6 x Wk.	Daily
Walking				2		
Swimming				1		
Tennis						
Bowling			1			
Golf	1			1		
Biking			2			
Mini-trampoline				1		

exercised for 30 minutes, five times per week, and the other subject exercised for 30 minutes six times per week.

Personal Home Exercise Program

Three subjects participated in their own personal home exercise program rather than attending a formal exercise class. One subject walked five to six times per week and occasionally did some specific back exercises. The second subject did a combination of walking, calisthenics, and stationary biking five times per week, and the third subject did calisthenics and chair exercises twice per week.

The three subjects each did their exercise program in the morning. The length of the exercise varied from thirty minutes per day to two hours per day. One person exercised alone and the other two exercised with at least one other person. One person exercised to music, two did not. All three of these subjects have been doing their personal home exercise programs for a number of years (three years, twelve years, and

fifteen years). These three subjects reported no financial costs for their exercise program.

All three subjects had attended a formal exercise program in the past (Senior Energize or Aerobics). Prior to their current home exercise program only one of the three did any other form of exercise. One subject had walked every day but does not any longer. This subject stated that in the summer she tries to swim everyday.

Summary

The convenience sample of a twelve volunteers utilized in this study were all caucasian, with a mean age of 74, nine women and three men. All were ambulatory, and in fairly good health. They were from varied socioeconomic backgrounds and varied level of educational backgrounds.

The twelve study subjects were classified into one of two groups, either formal exercise or personal home exercise. Nine subjects were classified as "Formal Exercisers" -those who participated in an exercise class with an instructor. The other three subjects were classified as "Personal Home Exercisers". These three subjects participated in their own program of exercise at home rather than attending a formal class.

The next section, Data Presentation, includes a discussion of the coding process and the coding categories and themes used to classify the study data. Methods used to insure validity will also be discussed.

Data Presentation

To answer the research question "What are the stated positive and negative effects of regular exercise in a group of older adults?", interviews were conducted with twelve elderly volunteers. The interviews were based on the questions in the interview guide (Appendix F). This researcher initially developed a set of coding categories

which were used to analyze the qualitative data obtained in these interviews. These categories, five positive and five negative were based on the idea that human beings are holistic, that is, man is a physical, affective, cognitive, spiritual, and social being. These categories also fit well with the Unitary Human Beings model of Martha Rogers (1979) utilized in this study. In an effort to validate these coding categories the researcher met with another nursing professional/"expert" to review and make any necessary revisions of the coding categories. The coding categories utilized in this study were:

Positive Effects of Exercise	Negative Effects of Exercise
Physical	Physical
Affective	Affective
Cognitive	Cognitive
Spiritual	Spiritual
Social	Social

To further classify, the data under an individual category was broken down into one or more coding categories. The initial coding categories were identified by the researcher with the actual interview transcripts. Ten prominent coding categories were derived from the subjects responses and from literature. These were ideas or opinions about the effects of exercise that were expressed by subjects in the interviews. Similar responses that occurred frequently in the interview transcripts were grouped together as a theme and categorized under one of the ten coding categories. These themes fell under seven of the ten categories. There were no responses that fit under three of the ten categories; positive spiritual, negative cognitive, and negative

spiritual effects. Therefore, no themes were identified under these three categories.

Interview transcripts were also reviewed by a nursing expert who generated a separate set of coding categories. The researcher and expert then compared coding categories and determined a mutually agreeable set of coding categories. The researcher then took this set of coding categories to her thesis chairperson for review. The chairperson made several recommendations for reducing the number of coding categories. These changes were discussed with the expert and a final set of coding categories was determined (see Table 10).

Table 10.

Coding Categories for Classifying the Qualitative Data

Positive Effects of Exercise	**Negative Effects of Exercise**
Physical	Physical
Physical Performance	Impaired Body Function
Health Maintenance/Prevention	
Affective	Affective
Well-being	Attachment
Cognitive	Cognitive
Mental Alertness	None
Spiritual	Spiritual
None	None
Social	Social
Social Interaction	Lack of Social Value
Social Value	Lack of Social Support

In Table 11, all of the coding categories and themes along with sample responses from the data to further describe each coding category

is presented. This list was used as a guide by the researcher and the expert for coding the actual interview transcripts. The sample responses are taken directly from the interview transcripts. As the researcher and the expert read through the transcripts these statements were identified (underlined or highlighted) as being a positive or negative effect of exercise. These responses were grouped together according to content and themes were developed to describe this group of sample responses.

Individual interview transcripts were reviewed by the researcher and the expert and each pertinent response was coded by underlining or highlighting the statement and writing the corresponding number for the theme next to it. Themes were numbered one through ten as follows:

I. Positive Effects of Exercise

Physical
1. Physical performance
2. Health Maintenance/Prevention

Affective
3. Well-being

Cognitive
4. Mental Alertness

Social
5. Social interaction
6. Social value

II. Negative Effects of Exercise

Physical
7. Impaired physical function

Affective
8. Attachment

Social
9. Lack of Social Value
10. Lack of Social Support

Coding by the researcher and the expert was done independently. The researcher then compared coded interview transcripts and calculated the degree of agreement between the two coders. Percentages of agreement were calculated for each coding theme across all interviews and for each interview itself.

Table 11.

Coding Categories and Themes with Sample Responses

Positive Effects of Exercise

I. Physical
A. **Physical Performance**
Increased energy
Increased stamina
Decreased fatigue
Increased flexibility
Increased strength
General physical fitness

B. **Health Maintenance/Prevention**
Decreased blood pressure
Decreased arthritis pain
Decreased constipation
Improved cardiovascular functioning
Improved circulation
Decreased cholesterol
Weight maintenance
Weight loss
Increased appetite

II. Affective
A. **Well-being**
Increased self-esteem
Feel good about yourself
Keeps you young
Positive acceptance of age
Confidence
Enjoyment
Cheerful
Relaxation
Contentment
Outlet for stress
Forget about your problems
Decreased depression
Enthusiasm for life
Healthy outlook
Something to look forward to
Positive attitude

III. Cognitive
A. **Mental Alertness**
Think more clearly
My mind is a little sharper

IV. Spiritual
None

V. Social
A. **Social Interaction**
Increased interest in others
Make new friends
Someone to talk to

B. **Social Value**
Exercise comes first
Schedule everything around it
Worth every penny
Would rather pay YMCA than Dr.
Worth more than can tell you

Negative Effects of Exercise

VI. Physical
A. **Impaired body functions**
Dryness

IX. Spiritual
None

Table 11. (cont.)

Shortness of breath
Muscle soreness
Warm (body temp.)
Thirsty
Hungry/Weight gain

VII. Affective
A. **Attachment**
Can't get along without it.
Get too strongly attached and miss other important things.
Make it too big a part of your life.

VIII. Cognitive
None

X. Social
A. **Lack of Social Value**
I wouldn't want to exercise everyday because it would take me away from other things that I enjoy.
Sometimes interferes with my own desires.
Interferes with other things we've planned.

B. **Lack of Social Support**
Husband resents time away.

Among the ten identified, coding themes the positive theme of Well-being had the most responses overall (141 for researcher and 134 for the expert). The theme of well-being for purposes of this research covered a wide variety of responses, for example, increased self-esteem, enjoyment, outlet for stress, and decreased depression. See Table 11 for a list of possible responses which were used by this researcher and the expert as a guide in coding the interview transcripts.

Some sample responses directly from the interview transcripts that represent the well-being coding category would be:

"It really makes people happy. I think that it's such a relaxing situation because you're able to get away from everything that might be troubling you, and you concentrate on the moves your making and you just really feel good doing them!"

"Well, I just have a better feeling about myself. I think you can easily go downhill if you don't exercise. You can more or less vegetate. And if you have this exercise where you have a positive

attitude and you're willing to get out and do things and help people... it just makes a difference in you're whole system, I think."

"I think that when you exercise you're active - you feel good. If you don't and you mope around the house you tend to feel self-pity and depressed, slightly depressed. This gets you going and it gives you confidence and it raises your esteem about yourself, I think. It makes you think your doing the right thing."

The total number of responses for each of the ten themes are identified in Table 12.

Table 12.

Total Responses of Researcher and Expert and Percentage Agreement by Theme Across all Interviews

Coding Themes	Researcher	Coders Expert	% Agreement
1. Physical performance	75	74	99%
2. Health maintenance/ prevention	54	54	100%
3. Well-being	141	134	95%
4. Mental alertness	6	6	100%
5. Social interaction	24	26	92%
6. Social value	20	17	85%
7. Impaired body functions	33	35	94%
8. Attachment	14	17	82%
9. Lack of social value	3	4	75%
10. Lack of social support	2	2	100%

The next most frequent response following well-being was Physical Performance. This theme included increased energy, stamina, strength, flexibility, decreased fatigue, and general physical fitness (Researcher 75--Expert 74). Examples from the interview transcripts for the physical performance theme were:

"I have noticed, I have an arm, my right arm has got arthritis in it due to a break I had and I never could get over here (subject demonstrated how she can now lift her right arm up over her head) now I do! In fact I used to have to wash the underside of my arm with a brush, you know because I couldn't reach it. Now I don't have to do that anymore". (The change mentioned by this subject occurred as a result of participation in a water exercise class.)

"I think I have a lot more energy than I used to have even the days I don't go (to exercise). I feel like I'm ready to go shopping! I'm ready to clean up my kitchen or bath or whatever! I just have more energy since I've been exercising.

"I think that my stamina and my flexibility have improved because of the exercise, and my strength too!"

The third most frequent responses were from the Health Maintenance/Prevention theme (Researcher 54--Expert 54). This theme focused on bodily functions or conditions that were improved or maintained as a result of exercise such as: decreased blood pressure, decreased arthritis pain, improved circulation, weight maintenance, decreased constipation, improved cardiovascular functioning, decreased cholesterol, and weight loss. Sample responses from subjects for this theme were:

"I like to exercise because it allows me to maintain my weight without dieting and I can eat just about anything I want including pie, cake, or a donut now and then without having to worry about gaining weight or feeling guilty."

"...last summer when I started exercising it encouraged me to change my eating habits and my cholesterol was way high and I've lost forty-

some pounds. The last time I had the cholesterol checked at that senior check at the hospital it had dropped from 276 to 237."

"Well, they (exercises) make you feel good and they get your circulation up and it's helpful...After I've been swimming up there I can feel the circulation going, I kind of feel all tingly."

The fourth most frequently mentioned responses were from the Impaired Body Functions theme (Researcher 33--Expert 35). This was the most frequently mentioned theme among the negative responses to exercise. The Impaired Body Functions theme covered subject responses having to do with negative or unpleasant physical side effects which occurred as a result of exercise such as; dryness, shortness of breath, muscle soreness, warm (body temp.), thirst, and hunger/weight gain. Subject quotes from individuals coded under this theme include:

In response to the question "How do you feel when you're finished exercising?" one subject said: "Warm! (laughing) Warm, out of breath... and then I usually stay down for a cup of coffee so I get a cup of coffee, have something to drink, you're usually thirsty!"

"You get sore in spots depending on... sometimes your twisting around - things like that. And of course, the swimming, the chlorine sometimes bothers me, at the Y, you can get itchy spots from the dryness."

The next two most frequently mentioned responses were from the positive social category. The two themes under this category were Social Value and Social Interaction (Social Interaction: Researcher 24--Expert 26; Social Value: Researcher 20--Expert 17).

The Social Interaction theme reflects the subjects responses with regard to other people such as: increased interest in other people,

making new friends, and someone to talk to. Responses form the social interaction theme include:

"...When I'm out walking I run into a lot of different people, and I've met a lot of people that way - just out walking. I meet a lot of people at the Y, I meet a lot of people at the bowling alley, and when I'm out walking I meet a lot of people."

"I like the fact that I've made lots of new friends at these exercise classes."

The Social Value theme was designed to reflect the subjects view of the value of exercise - both the financial and the time investment. Subject responses under this theme show how important exercise is to some older adults.

"Well, I would a heck of a lot rather pay at the YMCA than I would to doctors up at the hospital."

"It's worth more than I could ever tell you! I had some Christmas money and I thought what better way to spend it."

In response to the researchers question "How do you find time to fit exercise into your schedule?" One subject responded: "You make it! You make it! You rearrange your schedule if possible. You schedule all your dental appointments and your doctors appointments earlier in the morning or on days that the classes don't meet - which means Tuesday and Thursday. Like hair appointments - Thursday, dental appointments and doctor appointments on Tuesday...I do at least!"

The next most frequently mentioned theme was from the negative affective category - Attachment (Researcher 14--Expert 17). This category was designed to reflect the subjects responses dealing with

over-attachment or obsession with exercise. Subject responses from the interviews were:

"I think that sometimes people can get so overly concerned about exercise that they make a god of it and they can't seem to get along without that particular exercise every single day at the same time and so on. And if they can't meet it then it makes them unhappy and uncomfortable. It gets to be like an addiction. I think that is one of the negative things if you make it too big a part of your life."

"...Sometimes it (exercise) interferes with my own desires. I mean if I would like to play golf, I will sacrifice the golf to go to the exercise first and rearrange my schedule. Or it interferes with different things we plan... that's all."

The positive cognitive theme of Mental Alertness was the next most frequently mentioned response (Researcher 6--Expert 6). The responses under this theme had to do with being able to think more clearly as a result of exercise. Subject responses were:

"It (walking) gives me more energy and I like to say it clears my body out. I can think better and everything else."

"I get a sense of well-being after I exercise... I feel good... I feel fine... I feel more confident... in charge of things... and I think my mind is a little bit sharper."

The negative social category, including the themes of Lack of Social Value and Lack of Social Support were the least frequently mentioned by interview subjects (Lack of Social Support: Researcher 2--Expert 2; Lack of Social Value: Researcher 3--Expert 4).

The theme of lack of social support was designed to reflect any statements regarding resentment or lack of support from family or

friends regarding ones involvement in exercise. There was only one subject whose husband was not supportive of her efforts to exercise and thus he was holding her back a little.

"In fact, I could stand to go five days a week but I'm married, and I have a husband and he likes my days when we have free time to go shopping or free to do something that he likes to do, you know. And he won't go, see he likes his chair too well!"

The lack of social value theme reflects the opposite of the positive social value statements. The theme of lack of social value reflects how some people prioritize exercise as having less value to them than some of their other activities. In contrast to the responses mentioned under the positive social value category the responses from this category reflect the subjects lack of value for exercise. A sample subject response is:

"I wouldn't want to exercise every single day of the week because it would take me away from other things I enjoy."

In sum, the qualitative data yielded from subject interviews was divided into ten categories, five dealing with the positive effects of exercise (physical, affective, cognitive, spiritual, and social), and five dealing with the negative effects of exercise (physical, affective, cognitive, spiritual, and social). These categories were then broken down into ten prominent themes. The theme of well-being, which fit under the positive affective category of responses, had the most coded responses. A discussion of the problems with the concept of well-being are discussed later in this chapter and in Chapter VI. The next three most frequently mentioned themes were: Physical Performance, Health Maintenance/Prevention, and Impaired Body Function (Table 12 provides a

complete breakdown of themes and the number of themes coded under each theme). The remainder of this chapter will include a discussion of the agreement between researcher and expert and an interpretation of the results.

Agreement Between Researcher and Expert

After all of the coding of interview transcripts was complete this researcher compared the experts coded transcripts with her own and calculated the percentage of agreement across all interviews by theme (see Table 12). Also calculated were the total percentage of agreement by theme for each interview transcript (see Appendix H). For the twelve interview transcripts the percentage agreement ranged from 75 percent to 100 percent.

In seven of the ten coding themes the researcher and experts percentage of agreement was above 90 percent. This percentage of agreement indicates that these themes were clearly defined so as to be understood by independent coders, indicating validity of concept. Among the other categories percentage agreement ranged from 75 percent to 85 percent. This lack of agreement indicates some problem in the coding process, possibly the labeling of the themes or the definitions of what should be coded under that theme. These three themes will be discussed individually in the following paragraphs.

The Social Value Theme had a percentage of agreement of 85 percent between researcher and expert. The theme of social value was designed to reflect the subjects view of the value of exercise - both financial value and the time investment value. The problem with this theme may have been lack of definition of the theme. This researcher and the expert seemed to have a slightly different interpretation of what

belonged under this theme. This researcher classified a total of 20 responses from the interview transcripts under the theme of social value and the expert classified 17. The discrepancy here seemed to be the fine line between "social value" and "attachment". For example in one interview the subject stated "I have difficulty fitting other things into my schedule - my exercise comes first. Everything else has to come around that, dental appointments have to be worked in between and everything else. And I don't have time really to be sick!". The researcher interpreted this subjects response as "social value". This subject placed much value on his/her exercise and did not let other things interfere. The expert, on the other hand, felt that this subjects response indicated that he/she was too strongly attached to exercise and therefore classified this response as "attachment". The researcher may have needed to define this theme more clearly and specifically.

The Theme of Attachment, had a percentage of agreement of 82 percent between the researcher and the expert. The theme of attachment, from the negative affective category, was designed to reflect the subjects response dealing with over-attachment or obsession with exercise. The researcher classified 14 total responses from the interview transcripts under this category of attachment, whereas the expert classified 17 total responses as attachment. Again, the problem may have been lack of definition of the term attachment or the line between what is "social value" and what is "attachment". The discrepancy here is due to a difference in interpretation of the terms between the researcher and the expert.

The Theme of Lack of Social Value, had a percentage agreement of only 75 percent between the researcher and the expert. However, this low percentage reflects a difference of only one response. The researcher identified three responses as Lack of Social Value and the expert identified four. Due to the small numbers involved here the percentage agreement calculates low.

The theme of lack of social value was designed to reflect how some people prioritize exercise as having less value to them than some of their other activities. In contrast to the responses coded as positive social value, this category reflects the subjects lack of value for exercise.

The expert coded the following response as "Lack of Social Value": "We used to go over to Fruitport School and walk in the winter time when it wasn't nice enough to walk here but I just did not enjoy that at all because the air seemed so stale and it just wasn't the same...". The researcher did not identify this statement as a lack of social value or code it under any other category. This difference of only one response resulted in a percentage agreement of only 75 percent.

This researcher would also like to address the theme of Well-being. Although the percentage agreement was high at 95 percent, the total number of responses for this theme by both the researcher and the expert indicate a problem in the research procedures. These problems could be the result of: problems in the coding system, lack of definition of the concepts, problems with the interview guide, or possibly a biased group of elderly subjects. The researcher identified 141 responses coded under the theme of "well-being" and the expert identified 134. This is nearly twice the number of response for any of the other themes. The

problem may have been that the theme of "Well-being" was too global and should have been broken down into several smaller, more specific themes. Originally the researcher and the expert had broken down the positive affective category into four separate coding categories: Well-being; Happiness; Contentment/Relaxation; and Improved Outlook on Life. Subdividing the positive affective responses further would have provided a more detailed look at what the subjects felt to be the positive effects of exercise and would have eliminated the excessively large category of well-being as in this study. Changes in the well-being theme are discussed further in Chapter VI under the heading of Coding Categories.

In sum, having a nursing expert also code the interview transcripts helped to validate the coding done by the researcher and also helped identify problem areas such as the well-being theme. In the next section the researchers interpretation of the study results will be presented.

Interpretation of Results

This study was designed to answer the questions, "What are the stated positive and negative effects of regular exercise in a group of older adults". The study subjects responses to this question were discussed in detail earlier in this chapter. In the following section a discussion of the interpretation of those findings will be presented.

This researcher felt that one of the most interesting and significant findings was the fact that the most frequently stated positive effects were categorized under the positive affective theme of well-being, a psychological effect of exercise. Ten of the twelve subjects had well-being as the most frequently mentioned response theme.

Although the theme of well-being should have been broken down into several themes the responses given would still have been coded under a positive affective theme giving strength to the idea that exercise not only has physical effects but psychological/affective effects as well. Most of the previous researcher has focused on the physical benefits of exercise for the elderly with little attention paid to the psychological/emotional effects. This researcher believes that there is a very strong mind-body relationship and that the psychological benefits of exercise are equally as important as the physical benefits.

The information in this study is of value to anyone concerned with the well-being of older adults such as nurses, physicians, exercise instructors, nursing home personnel, and senior activity directors. Older adults need to be instructed that they will not only benefit physically from exercise, but they may actually feel younger, have an increased self-esteem, decreased depression, and may feel more relaxed, confident and cheerful. These may be good enough reasons to convince an older person to start an exercise program. It is also important for health professionals to understand the psychological benefits of exercise as it can be used as a therapeutic tool to treat a person with depression, stress, or decreased self-esteem.

In comparing the data from the nine female and three male participants in this study no obvious differences were found in their statements regarding the positive and negative effects of exercise. Both men and women can benefit from a program of regular exercise. The participants in this study who attended "formal" exercise programs enjoyed the fact that the classes were co-ed. It was an excellent social contact for them and one "couple" actually met while exercising

and have been "going together" ever since and continue to exercise together regularly.

No differences were found when comparing the data from the subjects who exercised in a group (formal N=9) and those who exercised at home (personal home exercise N=3). All three who did the personal home exercise were female. One of these women actually exercises with a small group of ladies in her apartment building but they had no formal instructor and no formal class organization. This woman rated the social interaction value of exercise very high, second only to well-being. One of the other home exercisers enjoyed a walking program. She usually walked alone and occasionally with another person. The third "home exerciser" did her own program of calisthenics and stationary biking. These second two home exercisers did not mention social interaction as one of the positive effects of exercise. However, of the nine subjects who participated in group/formal exercise, six made comments that were coded under social interaction and three did not.

One question that this researcher wanted to answer with this research was "Are the psychological benefits (Well-being items) reported truly a result of the exercise itself or is it a result of the social interaction of being a part of the group?" According to this study even the two subjects who exercised alone (no social interaction) had well-being as the most frequently mentioned category of responses. The three "formal" exercisers who did not mention social interaction as a positive effect of exercise rated well-being within the top three categories of responses. This researcher interprets this to mean that social interaction is an important benefit to exercising with a group but the social interaction itself is not the cause for the improvements in well-

being seen with regular exercise. Implications for this finding are that health care professionals should encourage seniors to choose an exercise program that meets their own needs and desires. A home exercise program can be just as beneficial as exercising in a group. If a senior has potential for social isolation group class would have the added benefit of the social interaction. It is important to fit the exercise program to the individual senior. Just as people of any age, some seniors enjoy doing things alone and other are more social and enjoy group activities.

Summary

This study was designed to answer the question "What are the positive and negative effects of regular exercise in a group of older adults?" In this chapter the data collected to answer this question was presented. The ten themes identified from the descriptive data were: Physical Performance, Health Maintenance/Prevention, Well-being, Mental Alertness, Social Interaction, Social Value, Impaired Body Functions, Attachment, Lack of Social Value, and Lack of Social Support.

For subjects in this study "Well-being" was one of the positive effects of exercise. The theme of well-being had the most overall responses followed by "Physical Performance" and "Health Maintenance/Prevention". The positive effects of exercise greatly outnumbered the negative effects as stated by these subjects.

Researcher:	320 total positive responses
	52 total negative responses
Expert:	311 total positive responses
	58 total negative responses

In Chapter VI a summary of findings as well as recommendations for future researcher and for the nursing profession will be presented. In Chapter VI a discussion of the relationship of current findings to other research and the relationship of the findings to the conceptual model will also be included.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary and Findings

A qualitative research study was designed to examine the stated positive and negative effects of regular exercise in a group of older adults. There has been an increasing amount of evidence in the literature of the physical benefits of exercise for the elderly, (DeVries, 1970); Amundsen, DeVahl, & Ellingham, 1989; Agree, Pierce, Raab, McAdams, & Smith, 1988; Gueldner & Spradley, 1988) but little is known about the psychological benefits of exercise in the older population. This research was designed to provide descriptive data about the positive and negative effects of exercise as stated in one-on-one interviews with elderly exercisers.

A conceptual framework based on Martha Rogers' Unitary Human Beings theory of nursing provided the structure to describe the stated positive and negative view of the aging process which fits well with the nature of this study. A literature review of the positive and negative effects of exercise was complete. Four theoretical frameworks each explaining how physical activity affects psychological variables were presented in Chapter III. The literature review included sections on physical effects of exercise, psychological effects of exercise, and the effects of exercise on the older adult. An interview guide utilizing two main open-ended questions was developed to obtain descriptive data regarding

the subjects positive and negative effects of regular exercise. The interviews were conducted with twelve older adults who were regular exercisers. The descriptive data obtained from these interviews yielded a set of coding categories and themes. The coding was conducted by the researcher and validated by another expert in the field of geriatric nursing. Ten major themes were identified that described the positive and negative effects of exercise as stated by the study subjects.

Relationship of Current Findings to Other Research

It is interesting to compare the results of this study to one done by Karen Sechrist, Susan Noble-Walker, and Nola Pender of Northern Illinois University (Sechrist, Noble-Walker, & Pender, 1987). Their study focused on the development and initial psychometric evaluation of an instrument to measure perceived benefits of exercise and perceived barriers of exercise. The instrument is called the Exercise Benefits/Barriers Scale (EBBS) and is based on Pender's Health Promotion Model. Their initial sample used to test the instrument was a convenience sample of healthy adults age 18-88 with a mean age of 38.7 years (N=664). This study included both exercisers and non-exercisers.

After initial factor analysis, Sechrist et al., (1987) identified nine factors to explain their exercise benefits/barriers scale data. These nine factors are very similar to the ten themes that were used in this study (see Table 13).

In the Sechrist et al., (1987) study factors 1, 2, 3, 5, and 7 represent the positive responses or benefits of exercise and factors 4, 6, 8, and 9 represent the negative responses or barriers to exercise.

Table 13.

Sechrist et al's "Factors" vs. This studies "Themes"

EBBS-Nine Factors	This Research--Ten Themes
1. Life Enhancement	1. Physical Performance
2. Physical Performance	2. Health Maintenance/Prevention
3. Psychological Outlook	3. Well-being
4. Exercise Milieu	4. Mental Alertness
5. Social Interaction	5. Social Interaction
6. Time Expenditure	6. Social Value
7. Preventive Health	7. Impaired Body Function
8. Physical Exertion	8. Attachment
9. Family Encouragement	9. Lack of Social Value
	10. Lack of Social Support

In comparing the results of this study with those of Sechrist et al., (1987) many similarities were identified between the factors and themes. Sechrist et al., (1987) did identify one barrier which they labeled "Exercise Milieu" (factor 4) which had no corresponding theme in this research. In all of the interviews conducted none of the subjects mentioned anything like those items categorized under exercise milieu (i.e., places to exercise too far away, exercise is too embarrassing, exercise costs too much, facilities have inconvenient schedules, people in exercise clothes look funny, and places to exercise are too few in number). Probably the main reasons that these types of responses did not come up in this researchers study is because all of the subjects were regular exercisers whereas the Sechrist et al., (1987) study included some non-exercisers. The types of responses coded under Exercise Milieu are typical "excuses" given for not exercising, and may have been responses from the non-exercisers in the Sechrist et al., (1987) study. Another possible reason that this study did not have a theme similar to Sechrist et al., (1987) Exercise Milieu is that the

participants for this study were from a very small community with a variety of low-cost, convenient exercise programs available to seniors.

Other barriers identified by Sechrist et al., (1987) that are closely related to a theme from this study include:

Sechrist et al., (1987) Factors		This Study Themes
#6 Time Expenditure	=	#9 Lack of Social Value
#8 Physical Exertion	=	#7 Impaired Body Functions
#9 Family Encouragement	=	#10 Lack of Social Support

The Sechrist et al., (1987) study did not have a barrier identified that would relate to the theme of Attachment as used in this study. The benefit factors and positive themes are closely related. Sechrist et al., (1987) factors 1, 2, and 7 (Life Enhancement, Physical Performance, and Preventative Health) are similar to themes 1 and 2 of this study (Physical Performance and Health Maintenance/Prevention). These factors all had to do with physical benefits or positive physical responses to exercise such as: improved strength, muscle tone, improved cardiovascular functioning, increased stamina, or improved sleep. This researcher listed "Mental Alertness" as a separate theme (#4) whereas Sechrist et al., (1987) listed increased mental alertness under factor 1 "Life Enhancement".

Sechrist et al., (1987) factor 3 "Psychological Outlook" is equivalent to this researcher's theme 3 "Well-being". Each include items relating to stress reduction, relaxation, enjoyment, improved mental health, and well-being.

Sechrist et al., (1987) factor 5 "Social Interaction" is equivalent to this researchers theme 5 also entitled "Social Interaction". Both of

these categories include items relating to meeting people and having contact with friends.

It was interesting to note how well these two studies complimented each other although one was a quantitative study using an instrument and the other a qualitative study using subject interviews. The great similarities between the benefits and barriers of the Sechrist et al., (1987) study and the themes of this study indicate that these are important and accurate factors which influence exercise behavior. Whereas previous researcher has focused primarily on measurement of actual physiological or psychological benefits of exercise, these two studies looked at the perceptions of subjects. These studies provide some insight into the psychosocial processes underlying exercise behavior. The Sechrist et al., (1987) study used the EBBS to measure perceived benefits and perceived barriers to exercise. This study examined the perceived positive and negative effects of regular exercise. While we know that perceptions influence behavior, the relationship of perceived benefits and barriers to real benefits and barriers remains an issue for future research.

In comparing the findings of this study to previous literature on the effects of exercise the researcher found that most of the subjects responses regarding the positive and negative effects of exercise could be validated by other research studies. For example, looking at the theme of "Physical Performance" as a positive effect of exercise, several subjects responses had to do with increased energy, increased stamina, improved strength, and improved general physical fitness. There have been numerous studies done on the psychological benefits of exercise. DeVries (1970), for example, found significant improvement in

physical work capacity in a group of older men following a program of vigorous physical conditioning. Other subject responses coded under physical performance had to do with improved flexibility as a positive effect of exercise. Raab, Agre, McAdams, & Smith, (1988) found that a 25 week exercise program resulted in improved range-in-motion of ankles, shoulders, and neck in a group of older women. Decreased fatigue was given as a positive physical benefit of exercise by several subjects in this study. Gueldner & Spradley (1988), in their study of nursing home residents, found that a program of outdoor walking lowered levels of fatigue after just three weeks.

Under the theme of Health Maintenance/Prevention many other positive physical effects of exercise were reported by study participants, for example: decreased blood pressure; improved circulation; decreased cholesterol; improved cardiovascular functioning; and weight loss. Each of these findings can be validated by previous research such as studies by DeVries (1970) and Cooper, Pollack, Martin, White, Linnerud, & Jackson (1976). Cooper et al., (1976) found a consistent inverse relationship among physical fitness levels and resting heart rate, body weight, percentage body fat, serum levels of cholesterol and triglycerides, glucose, and systolic blood pressure.

The category of positive affective effects of exercise included the theme of Well-being. Although a wide variety of subject responses were coded under the theme of Well-being, studies dealing with the psychological effects of exercise validate many of these responses. Folkins & Sime (1981), in a review of the literature on physical fitness training and mental health, concluded that physical fitness training leads to improved mood, self-concept, and work behavior. Responses

coded under the theme of Well-being included increased self-esteem, positive acceptance of age, healthy outlook, positive attitude, confidence, and enthusiasm for life. Goldberg & Fitzpatrick (1980) found that participants in a movement therapy group demonstrated significant improvement in total morale and attitude toward own aging.

A decrease in depression and an outlet for stress were responses offered by subjects as positive effects of exercise. A large number of studies have been done on the ability of exercise to reduce stress and decrease depression. Doyne et al., (1988) found that both aerobic and nonaerobic exercise were effective in decreasing depression in a group of young women. Parent & Whall (1984), in their study of older adults, found that subjects who participated in regular physical activity had increased self-esteem and decreased depression.

Under the category of cognitive effects of exercise several subjects stated that exercise allowed them to think more clearly. Exercise programs have been related to improved cognitive performance among geriatric mental patients (Powell, 1974; Stamford, Hambacher, & Fallica, 1974). These studies suggest that exercise may be useful as a means of reversing or slowing the physical degeneration process of aging.

No studies were located during the literature review that dealt with the area of social interaction or social value as positive effects of exercise. Subject responses coded under the theme of Social Interaction had to do with an increased interest in other people and making new friends. The theme of Social Value reflects the subjects view of the value of exercise - both the financial and the time investment.

Subjects in this study were asked what they felt were the negative effects of exercise. Themes developed out of the subjects responses to

the question of negative effect of exercise were: Impaired Body Functions, Attachment, Lack of Social Value, and Lack of Social Support. Little research has been done on the negative effects of exercise. Sechrist et al., (1987) developed a tool to measure the perceived benefits and the perceived barriers to exercise. Some of the barrier items in Sechrist et al., (1987) study were similar to subject responses for lack of social value and lack of social support such as: too much time from family responsibilities, takes too much of my time; spouse is not encouraging, and family is not encouraging (Sechrist et al., 1987).

Overall, the responses offered by the subjects in this study as what they felt to be the positive and negative effects of exercise, are supported by the findings in the literature. Areas that did not seem to be addressed adequately were: the social effects, both positive and negative; and the negative effects of exercise in general. Perhaps the reason that there were so few responses dealing with the social effects of exercise is that there were no probes in the interview guide specifically dealing with the social effects of exercise. The fact that these subjects were all active exercisers explains why fewer negative effects of exercise were given. These subjects enjoy exercising, for them the positives outweighed the negative, otherwise the subjects would not continue to exercise. Future research studies should include a group of non-exercisers to better understand the perceived negative effects of exercise. It will be important for future researcher studies to examine these areas as they may be factors that influence peoples participation in regular exercise.

Relationship to Conceptual Model

Most of the subjects in this study had a very strong health belief system which could be identified by some of their statements from the interviews and from the information on their sociodemographic questionnaires. Eight of the twelve subjects had been exercising for over three years, one as many as fifteen years. These subjects believed strongly in the benefits of exercise and the benefits outweighed any negative side-effects that they may experience. If these people did not feel this way about exercise then they probably would not continue with their exercise programs.

This idea of positive health beliefs fits well into the conceptual model based on Martha Rogers theory of Unitary Human Beings. In her model, Rogers discusses the negentropic theory of aging. Within the negentropic theory, aging man is viewed as becoming more complex, increasing in diversity, increasing in heterogeneity, more enriched, not a winding down, but a speeding up (Rogers, 1970). The idea that aging does not have to be a time of decreasing activity and slowing down fits well with the beliefs of the subjects in this study. One subject during the interview had been talking about the fact that she had always led an active, busy life and had even adopted two young children when she was 40 years old. She went on to explain that the reason she still felt good at her age was because "I didn't start to sit in the rocking chair at that critical time when the children didn't need me as much. I went to exercise classes and I think that kept my health up". This statement also supports Rogers concept of "open systems". Rogers indicates that both man and environment are open systems that are in dynamic interaction such that each is continually affecting the being affected

by the other. In the example above the exercise classes are part of this subjects environment. The interaction between this subject and her environment (the exercise class) results in a positive outcome - she feels better and is maintaining her health.

The concept of energy fields is one of the major building blocks of Rogerian theory. Energy fields constitute the fundamental unit of all living and non-living substances (Rogers, 1980). Rogers describes two such energy fields in her model: the human energy field and the environmental energy field. This idea of energy fits into the results of this researcher. The theme with the second highest number of responses was theme #1 "physical performance" which had to do with increased energy, stamina, strength, etc. as a result of regular exercise. In Rogers model an open system is one that exchanges energy with the environment and all living things. The subjects in this study (human energy fields) are expending energy to the environment through exercise and are also getting energy back. Many of the subjects stated that exercise made them feel energized! For example, in response to the question "What would you say are the positive effects of exercise?" one subject stated "Energy! It gives me more energy! Makes you feel better. I can do more work because I have more energy. I can keep at something longer. I don't tire as easily".

Rogers states that man has some control over his own aging process. "Man knowingly makes choices. Through awareness of himself and his environment, he is an active participant in determining the patterning of his field and in reorganizing the environment in accord with his own desires" (Rogers, 1970, p. 71). Each of the twelve subjects in this research study made the choice to exercise. They found that exercise

was one way to accommodate the normal changes of aging. Many of these subjects also found that exercise helped them deal with the losses that typically occur as one ages, for example the loss of health and the loss of friends. Exercise helps them to combat the changes in health and is a way to stay in contact with friends and also to make new friends.

The twelve subjects in this study may be different, however, from the general public. Some people do not share this positive attitude about health and fitness. Some older adults believe that as one ages one should slow down and relax. These individuals would therefore make different choices and would repattern their fields in a different way. The pattern and organization of the human energy field is continuously changing, continuously repatterning and reorganizing along life's continuum (Rogers, 1980). Rogers (1970) describes human and environmental fields as being characteristic of wave patterns that are never steady, but rather become increasingly more complex as the life process evolves. Whelton (1979) interpreted this to mean that an individual's lifestyle and habits develop out of multiple man-environment interactions. The subjects in this study choose to include exercise as a part of their lifestyle and therefore may repattern in a somewhat different way than those who do not exercise. Rogers theory of Unitary Human Beings provided an excellent framework for this study. The concepts of open systems, energy fields, and pattern and organization were easily applied to this study and are identified in the model.

Implications for Nursing

As the population of older adults continues to grow it will become increasingly important for health care professionals, including GCNS's

to find ways to maintain the health and well-being of the elderly. The role of the gerontological clinical nurse specialist in primary care is based upon a holistic approach to man. As such, the GCNS cares for older adults at all points along the health-illness continuum. The nursing focus on health maintenance and health promotion in the older adult is one way that nursing differentiates itself from the traditional illness-focused medical model. Historically, physicians have treated the chronic disease and acute illnesses of the older adult with little emphasis on health education or prevention. As our society becomes more aware of the many benefits of physical fitness health care professionals of all disciplines are beginning to encourage a more active life for our senior citizens. It is important to have scientific evidence and supportive information from research studies to support the claims that exercise is beneficial for older adults. This study along with other nursing research studies on exercise and the older adult will continue to add to the body of knowledge and nursing theory and will thus improve the outcomes of nursing care.

Implications for Nursing Practice

The role of the GCNS in primary care "places" emphasis on wellness, on promoting the clients and their families' abilities to cope with illness and aging changes, on adjustment and adaptation to disability and incapacitating illness, and supporting and enhancing the older adults individual strengths and assets" (MSU NE 564 syllabus Fall 1985, p. B16-17). The findings in this study have implications for GCNS's as they educate clients and promote exercise. Knowing what an actual group of older adults felt to be the positive and negative effects of exercise will be valuable information to pass on to older adult clients

considering an exercise program. Being able to share with clients what their peers found to be the positive and negative effects of regular exercise will provide a more realistic form of encouragement and will justify some of the claims made by the media and other sources. Understanding the perceived positive and negative effects of exercise will also help the GCNS in convincing clients who are hesitant about starting an exercise program. The GCNS can use personal accounts of clients from the study who tell of the many positive effects of exercise they experienced. It would be beneficial to be able to relate testimonials of other elderly people who have started exercising in later life, such as the subjects in this study.

Being aware of what older adults perceive to be the negative effects of exercise is important for the GCNS as he/she prescribes exercise to his/her clients. The GCNS should explain the possible "side-effects" of exercise, such as the items coded under "impaired body functions" in this study. The GCNS should also instruct elderly clients on the proper way to begin an exercise program so as to avoid these side-effects. For example, the GCNS should tell his/her clients to begin slowly, progress gradually, include a warm-up and cool-down period, and drink plenty of fluids while exercising. These tips may prevent some of the negative effects of exercise identified by subjects in this study.

The GCNS in primary care should encourage all of his/her clients to exercise. While educating the client on the benefits of regular exercise it is important to not only explain the physical benefits such as decreased blood pressure and weight loss (Cooper, 1976), but to explain the psychological benefits such as those identified by the

subjects of this study, i.e., well-being, mental alertness, social interaction, and social value.

The GCNS in primary care has a responsibility to assess the needs of his/her community with regard to the elderly population. In addition, the GCNS "should be involved in planning, organizing, administering, and monitoring pertinent health services for the communities older persons" (MSU NE 564 syllabus Fall 1985, p. B19). Nurses should be aware of what exercise programs are available to seniors in their area and should make him/herself available as a consultant to assist these agencies in providing the highest quality and most appropriate programs for the elderly.

The GCNS should take the responsibility to monitor exercise classes being offered to seniors in the area. He/she should keep the exercise instructors informed of current research in the area of older adults and exercise by sending them articles or being available for inservices or consultation. The GCNS should also take responsibility to insure that seniors in the area know what to look for in an exercise class. He/she should make available a checklist of what to look for in an exercise class. These checklists should be made available to all of the GCNS's clients and should be distributed through other health care providers and senior centers.

The GCNS should also take responsibility to educate physicians and other health care providers in his/her area as to the positive and negative effects of exercise. A summary of the findings of this study could be sent to area physicians. The GCNS should also encourage physicians to use their influence with their elderly clients to encourage exercise. The GCNS could provide a sample exercise

prescription and follow-up sheet to the physicians and be available for consultation.

Implications for Nursing Research

In doing this research project it became evident to this researcher that little nursing researcher has been done on the area of exercise and older adults. Most of the studies on the physical effects of exercise have been conducted by physicians and sports medicine personnel. The studies dealing with the psychological effects of exercise were conducted primarily by psychologists. It is important for nurses to develop their own body of knowledge. The area of gerontology is growing rapidly. Nurses need to be involved in adding to the knowledge base of gerontology. Exercise and it's ability to reverse or slow the effects of aging is becoming an extremely important topic as the aging of America continues.

Nurses work first hand with elderly clients and can have a great impact on their health promoting behaviors. Studies like this one dealing with elderly individuals' perceived positive and negative effects of exercise can assist nurses in educating and encouraging their clients. This research study provides a starting point for other nursing research in the area of exercise and aging. Although several problems were identified in this research process, this study can serve as an example for other nurses designing qualitative studies on the topic of exercise and aging. This study did add several important findings to the body of nursing knowledge. That is, elderly exercisers recognize not only the physical benefits of exercise but the psychological benefits as well. Elderly individuals have some difficulty separating out the specific types of benefits they experience

from exercise. Therefore, interview techniques or questionnaires must be designed to assist subjects in identifying their feelings about exercise without guiding them too much. Another important finding of this study was that elderly people really enjoy exercise. For whatever reason, physical, emotional, or mental, older subjects exercise because it makes them feel better. More research needs to be done to further describe the "feeling better" phenomena.

It is important for the findings of this, or any study, to be disseminated to other professionals and other interested parties. This researcher will share the results of her study with the directors of area exercise programs and will encourage them to use the information to improve or validate their activities. This researcher will also attempt to identify community agencies where exercise programs are not available or encouraged and will educate these agencies on the importance of regular exercise for seniors. By sharing the results of this study this researcher will also be acting as a role model in nursing.

Implications for Nursing Education

All nursing curriculums should include courses in gerontology. Until recently gerontology was an area that was not well addressed in nursing or other health professionals educations. As the population of older adults continues to grow, nurses, physicians, and other health care workers, need to have an understanding of the aging process and the specific needs and concerns of older adults. One of the needs of all older adults is exercise. The idea of people over 65 involved in an exercise program is a fairly new idea. We used to believe that as people got older they should slow down and relax. As research proves that exercise does benefit older adults these findings need to be

incorporated into the educational programs of health care professionals. Exercise has many benefits for older adults such as; decreased arthritis pain, decreased blood pressure, increased flexibility, increased energy, increased circulation, increased cardiovascular functioning, decreased weight, and decreased cholesterol. Nurses should have an understanding of the benefits of exercise so that they can prescribe exercise as part of the treatment regimen for many of the problems of their elderly clients. This education on exercise and the elderly should also include attention to the psychological benefits of exercise and its' value in the treatment of problems such as depression.

The general public is becoming more and more aware of the benefits of an active lifestyle. As the current generation of health conscious adults become senior citizens they will have questions and concerns about exercising in their later years. Nurses must be prepared to deal with these issues.

Revisions for this Research Study

This research study can be differentiated from most previous studies on exercise by the fact that this study looked at the effects of exercise as perceived by older adults. Previous research has focused primarily on measurement of actual physiological or psychological benefits of exercise (Cooper et al., 1976; Raab et al., 1988; Hayden et al., 1986). While these actual benefits are important, we know that behavior is often based on one's perceptions. Therefore, the relationship between the positive and negative effects of exercise as stated by individual older adults and the actual benefits as stated by researchers remains an issue for future research.

In the following section this researcher will discuss ways that this study could be revised in future research projects to improve outcomes or to further validate the findings. Areas for revision discussed will include: the study sample, coding categories, and the interview guide.

The Study Sample

Denzin (1970) refers to subject bias as one of six threats to internal validity. Subject bias is defined as "the difference between the kinds of people studied and those not studied" (Denzin, 1970). The subjects in this study were all caucasian, middle to upper-middle class, and fairly well educated and were all currently avid exercisers. To decrease this subject bias in future studies a more random sample should be utilized. Subjects should be drawn from a variety of socioeconomic and ethnic backgrounds, non-exercisers as well as exercisers could be included.

The sample population for this research was a volunteer sample of active, well elderly individuals who were regular exercisers. It would be interesting to include in a study sample some of the more frail and chronically ill elderly, possibly adult foster care or nursing home residents. A study could be done with seniors who exercised in the past but were not currently involved in an exercise program, or seniors who have never exercised before.

It is this researchers opinion that it would be valuable to repeat this study using a more quantitative approach, for example, random assignment and a control group. It would be interesting to take a group of previously inactive older adults and randomly assign half to an 8-12 week program of regular exercise and half to a craft, music, or some other type of non-exercise group for an equal length of time. Pre- and

post-tests could be conducted with each subject to find out what they perceived to be the positive and negative effects of their activity. This research would provide some insight into the question of whether the socialization of exercise programs is the cause of some of the benefits or if the benefits are a result of the exercise itself.

This study did partially address this issue in that three of the twelve participants did their own "personal home exercise program" which did not involve contact with a group of people. These three participants had very similar results to those who exercised in a group. It would, however, be beneficial to design a study with a more balanced number of "formal" versus "informal" exercisers, perhaps a larger total number of subjects more evenly divided into formal and informal exercisers. A group of subjects involved in some non-exercise activity such as a craft class or card group could also be included. The research question might be... "Physical exercise versus socialization as the cause of the stated positive and negative effects of regular exercise in a group of older adults".

Coding Categories

The problems with the coding system were identified in Chapter V. Problems identified with the coding categories stemmed from the lack of definition of some of the coding categories which caused discrepancies between this researchers coding and the experts coding. Specifically, the coding categories of Social Value, Attachment, and Lack of Social Value needed further definition. In future studies specific written definitions of each category and theme should be developed. The researcher and expert should be in complete agreement of all definitions.

One necessary change for future research projects would be to break down the coding category of "well-being" into several smaller categories. In this research the "well-being" category was disproportionally larger than all of the other coding categories. There have been many attempts to define the concept of well-being. Different terms have been used throughout the literature such as; adjustment, competence, morale, or happiness. These studies are unified by their parallel objective of assessing the general affective experience of older persons in terms of a positive-negative continuum (Larson, 1978). In the past there have been two general approaches to the concept of psychological well-being (Neugarten, Havighurst, & Tobin, 1961). One viewpoint "focuses upon the overt behavior of the individual and utilizes social criteria of success or competence" (Neugarten et al., (1961, p. 134). According to this definition of well-being "the greater the extent of social participation and the less the individual varies from the pattern of activity that characterized him in middle age, the greater is his well-being" (Neugarten et al., 1961, p. 134).

The second point of view focuses on the individual's internal frame of reference. In studies using this approach the variables measured have been the individuals' own evaluations of his present or past life, his satisfaction or his happiness (Havighurst & Albrecht, 1953).

In reality well-being is probably a combination of both internal and external factors. In an extensive review of the literature, Larson (1978), concluded that health, socioeconomic status, marital status, occupational status, availability of transportation, housing, and social activity are all related to subjective well-being. In his study, Larson (1978), provides estimates of the proportion of variance attributable to

each of these variables for the general population of older Americans. According to Larson (1978), these variables explain, at best, 50 percent of the variance in the concept of well-being. While these factors demonstrate the importance of situational factors, it is clear that a great deal of variance in well-being scores is unexplained by these variables. Further research must be done in this area and attempts made to develop a model which best represents the complex concept of well-being.

The findings of this study were compared to the concept of well-being or life satisfaction as defined by Neugarten et al., (1961). This researcher found that most of the subject responses coded under well-being fit well with the five components of Neugarten et al., (1961) Life Satisfaction Rating Scale. Neugarten et al., (1961) defined life satisfaction according to five components: Zest vs. Apathy; Resolution and Fortitude; Congruence between desired goals and achieved goals; Self-concept; and Mood tone. Subject responses given that would fit into this concept of well-being or life satisfaction are: feel good about myself, keeps you young, positive acceptance of age, confidence, enjoyment, cheerful, contentment, enthusiasm for life, healthy outlook, something to look forward to, and positive attitude. Responses given that did not fit into Neugarten et al., (1961) definition are: relaxation, outlet for stress, and forget about your problems. In comparing this studies findings to other measures of well-being, such as the Philadelphia Center Geriatric Morale Scale (Lawton, 1975), similar interpretations can be made. Measures of subjective well-being of older adults used the terms; satisfaction, happiness, acceptance, and usefulness. None of these studies reviewed included decreased stress or

increased relaxation as characteristics of well-being. Therefore, in future studies a separate theme dealing with stress and relaxation should be included.

One possible way of subdividing the well-being category for future studies would be to separate out three different themes: Well-being, Outlook on Life, and Stress management. The well-being theme would focus on how the individual felt about him/herself, an internal focus. In contrast, the Outlook on Life theme would have a more external focus. Under the theme of Outlook on Life would be items relating to the subjects feelings about the world around him, his/her mood, and attitude towards life in general. The third theme could be titled stress management and would include subject responses regarding exercise as a form of relaxation, an outlet for stress, or a way to forget about ones problems. Table 14 shows these three themes with sample subject responses that might be coded under each theme.

Table 14.

Three Affective Themes with Sample Subject Responses

Well-Being	**Outlook on Life**
increased self-esteem	enthusiasm for life
feel good about yourself	health outlook
positive acceptance of age	positive attitude
confidence	something to look forward to
decreased depression	cheerful
Stress Management	
relaxation	
outlet for stress	
forget about problems	
contentment	

There are other ways the affective category of positive effects of exercise could be divided. One could choose to use categories established by other researchers such as Sechrist et al., (1987). Sechrist et al., (1987) included two affective type categories: Life Enhancement and Psychological Outlook.

In this study, with all affective responses coded together under well-being, the data was of very limited value because the category was so broad and all-inclusive. It would seem then that sub-dividing the affective category into several smaller, more specific categories would improve the overall value of the research data. However, this researcher feels that a problem may arise with subjects being unable to discriminate the differences between physical and emotional responses to exercise. For example, under the theme of stress reduction, items would include: relaxation, outlet for stress, forget about problems, and contentment. The concept of relaxation has both physical and emotional components. It would be preferable to be able to separate out the physical and emotional components, however, subjects may not be capable of making those fine distinctions. Most people, including subjects in this study, have some difficulty separating out the specific positive effects of exercise. When first asked the question: "What are the positive effects of exercise?" many subjects responded, "It just makes me feel good!". There seems to be some generic therapeutic value to exercise that is difficult to define. Perhaps it is the diversion from the other activities of life that exercise provides. It could be a physical or chemical response within the body. More research needs to be done on the connection between the physical and psychological responses to exercise.

The Interview Guide

The original idea for this research was to ask only the two main research questions of: "What would you say are the positive effects of exercise?" and "What would you say are the negative effects of exercise?". However, it was discovered during the pretest and in the interview process that the subjects required a more guided interview format and that each probe question was necessary to elicit adequate information. Subjects were fairly good at relaying the physical effects of exercise and to some degree the affective effects. Very few brought up cognitive effects or social effects and none of the subjects reported a spiritual response to exercise.

Subject responses were biased towards the positive effects of exercise, that is, there were more positive effect responses than negative effect responses. The researcher coded 320 total positive responses and 52 negative responses. The expert coded 311 positive responses and 58 negative responses. One reason for this imbalance in positive versus negative responses is that the subjects were currently involved in exercise and therefore they believed that the positives outweighed the negatives, otherwise they probably would not have continued their exercise programs. If subjects who had never exercised or who had exercised in the past and quit were included perhaps more negative effects would have been recorded.

Another possible explanation for the imbalance of positive and negative responses given is the imbalance in the number of interview probes asked, subjects were asked nine probe questions dealing with the positive effects of exercise and only four probe questions dealing with

the negative effects. In future research projects a more balanced number of interview probes should be used.

In the analysis of these study findings a problem with the interview guide was discovered. Although the probes were necessary to elicit adequate responses from the study subjects, they also biased the results of the study by encouraging responses in certain areas. For example, five of the nine probes had to do with the affective responses, all of which would then be coded under well-being. This partially explains the disproportionate number of responses coded under the theme of well-being.

One would expect seniors to value the social interaction of exercise, however, very few responses were given for social interaction (researcher 24, expert 26). One explanation for this is that there were no probe questions specifically asking the social interaction of exercise. This lack of specific probe questions also explains the low number of responses coded under social value (researcher 20, expert 17), and mental alertness (researcher 6, expert 6).

One possible solution to these issues for future studies would be to include more probes, specifically positive probes dealing with social interaction, social value, mental alertness, and an equal number of negative probes. The problem with adding more probes is that the study becomes less qualitative. The idea of this research study was to find out what older adults perceived to be the positive and negative effects of exercise. Leading the interview process with specific probe questions would ultimately bias the results of the study.

A focus group could be utilized to try to discover what an actual group of older adults perceived to be the positive and negative effects

of exercise. Two focus groups could be conducted, one with a group of seniors who exercise together regularly and one with a group of seniors who do not participate in exercise. The exercisers would most likely come up with positive effects of exercise and non-exercisers may focus more on the barriers or negative effects of exercise. The researcher could ask each group to just talk about exercise. Perhaps in an informal group setting the older adults would come up with the correct wording for future probes and coding categories. Developing the probe questions and coding categories through the use of a focus group may decrease the discrepancies as found in this study and increase the validity of future research studies.

Future Research Questions

This study has shown that older adults, at least this particular group of older adults, do perceive there to be many positive effects of exercise, as well as a few negative effects. One question that will be important to answer in the future is "Is it exercise itself that results in the benefits as stated by older adults or are these benefits the result of socialization?

As the results of this study indicated, one's well-being appears to benefit from a program of regular exercise. Future research should focus in on this concept of well-being and attempt to determine a cause and effect relationship between exercise and well-being. Does exercise cause improvement in well-being or is it that people who are at a higher level of well-being are the ones who seek out exercise?

Few studies have been done that examine the effects of exercise on mental alertness or cognition. As life expectancy continues to increase it will be important to try to keep older adults as mentally alert as

possible. Research questions to be asked include: Can a regular program of physical exercise result in improved levels of alertness? Or can regular exercise slow the "normal" changes in cognition that often accompany the aging process? Can exercise benefit patients with Alzeimers disease?

As we continue to discover the many benefits of exercise for older adults it will become important to determine the specific requirements of an exercise program in order for it to be beneficial. For example: What are the effects of aerobic exercise vs non-aerobic exercise? A comparison could be done with common exercises for older adults such as walking, swimming, and low-impact aerobics to determine which is most beneficial. Other questions to be researched are: How often should the older adult exercise? Is weight lifting beneficial for seniors? What benefits result when the very old (over 75) begin an exercise program?

As we strive to improve the overall health of older adults our goal should be to increase the number of seniors who participate in regular exercise. The more scientific evidence to support the claims of exercise enthusiasts we have, the more effective, we, as health care providers can be in educating and encouraging our clients to pursue improved physical fitness.

Limitations

The limitations of this research study are:

1. The small sample population (N=12) included only active, well elderly. Therefore, these findings cannot be applied to other populations such as the frail, chronically ill, or mentally ill elderly.

2. This study included only subjects who were currently regular exercisers. These subjects, therefore, had many more positive effects of exercise than negative. A population that included subjects who were not currently exercising but had in the past may had different opinions about the positive and negative effects of exercise.
3. The subjects for this study were all white, middle to upper-middle class individuals from a small, Western Michigan community. The results, therefore, may not apply to other ethnic groups, social classes, or individuals from large cities or other parts of the country.
4. The subjects for this study may have had personality traits that made them different from other older adults. For example, these study subjects may have been very optimistic and had a high level of well-being even before beginning their exercise program. No psychological or personality testing was done with these study subjects.

Summary

This chapter provides a summary and conclusions for this research project. A discussion of the relationship of current findings to other research is included as well as the relationship to the conceptual model. Implications for nursing practice, education, and research were presented and ideas for future research questions are discussed.

Conclusions

The purpose of this study was to collect descriptive data about the effects of regular exercise on elderly individuals. Although this was a small study, (N=12), with several analysis problems such as the overly

broad well-being category and the lack of probes for all categories, some general conclusions can be made regarding the positive and negative effects of exercise as perceived by a group of older adults.

First, elderly people do believe that there are many benefits to exercising regularly. They recognize not only the physical benefits of exercise but the emotional or psychological benefits of exercise as well. For older adults who are actively involved in a program of regular exercise, such as the subjects in this study, it was interesting to note how much they valued their exercise. The items coded under social value gave some indication of how important exercise had become to these subjects. For example, they were willing to schedule other appointments around their exercise time.

Based on the subjects in this study, the conclusion can be made that although older adults do seem to recognize the generic therapeutic value of exercise, it is rather difficult for them to discriminate exactly how exercise affects them. It was necessary to use all of the probe questions for the twelve subjects in this study. They were unable to define the specific positive and negative effects of exercise without guidance from the researcher. This guidance in the form of probe questions was ultimately a threat to validity of this study as it focused the subjects responses towards specific categories.

Lastly, the conclusion can be made from this study that older people really enjoy exercising. For whatever reason, whether it is the socialization, the relief of stress, or a physical-chemical reaction to movement - older people like to exercise! This is not always true of younger populations. Many younger people exercise because they want to have slim, muscular bodies. They do not necessarily enjoy it but they

feel it is something they must do. Seniors, on the other hand, exercise for different reasons. They would not continue exercising if they did not get some enjoyment out of it. It is important for instructors of senior exercise classes to recognize this need for enjoyment. Instructors of senior exercise classes should make the class challenging yet achievable, add a variety of activities, use music, allow socialization and group participation, and include an education component, but most of all make it fun!

APPENDIX A

Poster

ATTENTION SENIOR EXERCISERS!

WANTED: MEN AND WOMEN AGE 65 AND OLDER WHO EXERCISE REGULARLY TO PARTICIPATE IN A RESEARCH STUDY FOR A MICHIGAN STATE UNIVERSITY - COLLEGE OF NURSING - GRADUATE DEGREE THESIS

RESEARCHER: [illegible]
GRADUATE NURSING STUDENT
MICHIGAN STATE UNIVERSITY

THE STUDY: "WHAT ARE THE STATED POSITIVE AND NEGATIVE EFFECTS OF REGULAR EXERCISE IN A GROUP OF OLDER ADULTS"

PARTICIPATION IN THIS STUDY WOULD INVOLVE A ONE-HALF HOUR INTERVIEW IN YOUR HOME OR OTHER MUTUALLY AGREEABLE LOCATION TO ANSWER QUESTIONS REGARDING YOUR FEELINGS ABOUT EXERCISE.

INFORMATION:

FOR MORE INFORMATION ABOUT PARTICIPATING IN THIS STUDY CALL:

TANIA VANDYKE (616)-846-3168

* YOU CAN LEAVE A MESSAGE ON THE ANSWERING MACHINE!

Exercise Study - Tania VanDyke - 846-3168
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Exercise Study - Tania VanDyke - 846-3168

APPENDIX B

Informational Flyer

ATTENTION

SENIOR EXERCISERS!

WANTED: MEN AND WOMEN AGE 65 AND OLDER WHO EXERCISE REGULARLY TO PARTICIPATE IN A RESEARCH STUDY FOR A MICHIGAN STATE UNIVERSITY - COLLEGE OF NURSING - GRADUATE DEGREE THESIS

RESEACHER: TANIA VANDYKE RN, C, BSN
GRADUATE NURSING STUDENT
MICHIGAN STATE UNIVERSITY

THE STUDY: "WHAT ARE THE STATED POSITIVE AND NEGATIVE EFFECTS OF REGULAR EXERCISE IN A GROUP OF OLDER ADULTS"

PARTICIPATION IN THIS STUDY WOULD INVOLVE A ONE-HALF HOUR INTERVIEW IN YOUR HOME OR ANOTHER MUTUALLY AGREEABLE LOCATION TO ANSWER QUESTIONS REGARDING YOUR FEELINGS ABOUT EXERCISE. ALL INFORMATION IS CONFIDENTIAL BY PARTICIPATING IN THIS STUDY YOU WILL HELP THIS RESEACHER UNDERSTAND WHAT EFFECTS EXERCISE HAS ON OLDER ADULTS - WHICH MAY INTURN HELP IN FUTURE RESEARCH AND FURTURE PLANNING OF EXERCISE CLASSES FOR SENIORS.

INFORMATION:

IF YOU ARE INTERESTED IN PARTICIPATING IN THIS STUDY OR WOULD LIKE MORE INFORMATION CALL:

TANIA VANDYKE - (616) 846-3168

OR FILL OUT THE BOTTOM SECTION OF THIS FLYER AND EITHER RETURN IT TO YOUR INSTRUCTOR OR MAIL IT TO ME AND I WILL CALL YOU.

☐ "YES, I AM INTERESTED IN PARTICIPATING IN YOUR STUDY. YOU MAY CONTACT ME BY PHONE"

NAME:_____ DATE:_____

PHONE:_____

MAIL TO: TANIA VANDYKE 319 S. SECOND ST. GRAND HAVEN, MI 49417

APPENDIX C

Screening Tool

Name:_____ Appendix C
Address:_____
Phone:_____

SCREENING TOOL

All potential participants will be asked the following questions during the initial phone conversation to insure that they meet the study criteria.

1. What is your age? _____
(Must be 65 yrs. or older)

2. Regarding your current exercise program...

How many days per week do you exercise? _____
(Must exercise at least three times per week)

How long is each exercise session? _____
(Exercise session must be at least 30 minutes long)

3. Do you participate in a "formal" exercise class ?
YES _____ NO _____

If yes, what is the name of the class and where does it meet? _____

4. Do you participate in your own personal exercise program?
YES _____ NO _____

5. How long have you been participating in your current exercise program ? _____
(Must have completed at least eight weeks of regular exercise.)

6. Are you able to walk? YES_____ NO_____
(Must be ambulatory)

ELIGIBLE _____ NON-ELIGIBLE _____

Date of interview:_____ Time:_____
Location of interview:_____
Directions:_____

APPENDIX D

Consent Form

CONSENT FORM

Investigator: Tania VanDyke RN, BSN
Graduate Student
Geriatric Clinical Nurse Specialist Program
Michigan State University
Home Phone: (616) 846- 3168

Date: _____

The study in which you will participate has been designed to determine the stated positive and negative effects of regular exercise on a group of older adults. This study is being conducted by myself, Tania Vandyke, as a part of my requirements for a masters degree in nursing from Michigan State University.

Participation in this study should take about thirty minutes of your time and will require you to respond to several questions as accurately and honestly as you can. The interview will take place at your home (or at another mutually agreeable location) during a time of your choice. The interview will be tape-recorded. Please be assured that your answers will remain confidential. There will be no identifying information on the tape or within the report of study results. The tapes of the interview will be kept in the researchers home until the research project is complete at which time they will be destroyed.

You may withdraw from the study at any time. You may refuse to answer any questions during the interview. If you have any questions regarding your participation in this research project, please call the researcher at any time. If you are interested in the results of the study, I would be happy to mail you a summary upon completion of the project. Thank you for your generous donation of time and effort.

Sincerely,

Tania VanDyke RN
G.C.N.S. Student
(616) 846-3168

THIS IS TO CERTIFY THAT I, _____ HEREBY agree to participate as a volunteer in the above named research project. I hereby give permission to be interviewed and for those interviews to be tape-recorded. I understand that, at the completion of the research, the tapes will be destroyed. I understand that the information may be

published, but my name will not be associated with the research.

I understand that I am free to deny any answer to specific questions during the interview. I also understand that I am free to withdrawl my consent and terminate my participation at any time, without penalty.

I have been given the opportunity to ask whatever questions I desire, and all such questions have been answered to my satisfaction.

(participant)	(date)
(researcher)	(date)

APPENDIX E

Sociodemographic Questionnaire

SOCIODEMOGRAPHIC QUESTIONNAIRE

1. Sex:(Check one) Male _____ Female _____

2. Date of Birth: Month_____day_____year_____

3. Marital Status: (check one)
   Married _____ Single (never married) _____
   Widowed _____ Divorced _____
   Separated _____

4. Living Situation: (check all that apply)
   Live alone: _____
   Live with spouse: _____
   Live with adult child (& family): _____
   Live with sibling(s): _____
   Live with other relative: _____
   Live with a friend: _____
   Live in adult foster care home: _____
   Live in a nursing home: _____
   Other (please specify): _____

OPTIONAL

5. Race/Ethnic background: (check one)
   Caucausian _____ Black/Afro-American _____
   Asian/Oriental _____ Mexican-American _____
   Other _____

6. Education (check highest grade completed)
   Grade School _____
   High school _____
   Vocational/Technical School (specify)_____
   College/University (degree obtained) _____

7. Income for the last year:

$0 - 5,000	_____	$40,000 - 45,000	_____
$5,000 - 10,000	_____	$45,000 - 50,000	_____
$10,000 - 15,000	_____	$50,000 - 55,000	_____
$15,000 - 20,000	_____	$55,000 - 60,000	_____
$20,000 - 25,000	_____	$60,000 - 65,000	_____
$25,000 - 30,000	_____	$65,000 - 70,000	_____
$30,000 - 35,000	_____	$70,000 - 75,000	_____
$35,000 - 40,000	_____	Above $75,000	_____

8. Present work status:

Full-time	_____	Retired	_____
Part-time	_____	Housewife	_____
Unemployed	_____	Other (Specify)	_____

9. What made you decide to start exercising?

Doctors order	_____	To get in shape	_____
To lose weight	_____	To meet people	_____
Something to do	_____	Other (specify)	_____

10. How would you describe your current health status? (check one):

POOR ____ FAIR _____ AVERAGE _____ GOOD _____ EXCELLENT _____

11. Chronic Illness (check any of the chronic illnesses that you have):

High blood pressure	_____	Arthritis	_____
Diabetes	_____	Heart disease	_____
Other (specify)	_____		

12. Other Medical Problems: (check any of the medical problems that you have or have had in the past):

Cancer	_____	Ulcer	_____
Heart attack	_____	Other (specify)	_____

13. How would you describe your current mental/emotional health? (check one):

POOR _____ FAIR _____ AVERAGE _____ GOOD _____ EXCELLENT ____

14. Have you ever been injured as a result of exercising?
Yes _____ No _____

If Yes, please describe the injury: _____

_____

15. Do you attend any other (non-exercise) group activities on a regular basis? Yes _____ No _____

If Yes, please fill in the grid below. Check all activities that you participate in and check the frequency category that best describes your participation.

	Less than once/month	1-3 times per month	once per week	2-3 times per week	4-6 times per week	Everyday
Craft Group						
Card Group						
Choir/Music Group						
Church Activities						
Volunteer Work						
Travel Group						
Other						

IF YOU PARTICIPATE IN A "FORMAL" (CLASS) EXERCISE PROGRAM COMPLETE THE FOLLOWING SECTION A (BLUE).

IF YOU PARTICIPATE IN A "PERSONAL HOME EXERCISE PROGRAM" COMPLETE SECTION B (PINK).

IF YOU PARTICIPATE IN BOTH A "FORMAL" AND A "PERSONAL HOME EXERCISE PROGRAM" COMPLETE BOTH SECTION A AND B.

SECTION A - "FORMAL" EXERCISE

1. What is the name of the exercise class you attend?

_____

2.How many days of the week do you attend the exercise class?

_____

3. What time of day do you attend the exercise class? (check one):

Morning _____ Afternoon _____ Evening _____

4. How many people are in the class? _____

5. How long does the class last each day? _____

6. Which of the following activities do you participate in in your class? (check all that apply):

Walking _____ Biking _____
Jogging _____ Stationary Biking _____
Aerobics _____ Chair Exercises _____
Calisthenics _____ Swimming _____
Other (specify) _____

7. Does the class use music to exercise by? Yes ___ No ___

8. How many weeks have you been attending this exercise program? _____

9. Is there a fee for this class? Yes _____ No _____

10. Prior to this exercise class, did you attend any other exercise programs? Yes _____ No _____
If Yes, please list the names of other classes and the dates you attended: _____

_____

11. Prior to this exercise class did you participate in any form of "personal home exercise program" on your own?

Yes _____ No _____

If YES, please fill in the grid below. Check all activities that you participated in and check the frequency category that best describes your participation.

	Less than once/month	1-3 times per month	once per week	2-3 times per week	4-6 times per week	Everyday
Walking						
Swimming						
Tennis						
Bowling						
Golf						
Biking						
Other						

STOP HERE IF YOU ONLY ENGAGE IN "FORMAL" EXERCISE. CONTINUE TO SECTION B (PINK) IF YOU ALSO PARTICIPATE IN A "PERSONAL HOME EXERCISE PROGRAM".

SECTION B - "PERSONAL HOME EXERCISE PROGRAM"

1. What type of exercise do you participate in as part of your personal home exercise program? (check all that apply):

Walking _____ Biking _____
Jogging _____ Stationary Biking _____
Calisthenics _____ Chair Exercises _____
Aerobics _____ Swimming _____
Other (specify) _____

2. How many days of the week do you exercise? _____

3. What time of day do you exercise? (check one):

Morning _____ Afternoon _____ Evening _____

4. How long do you exercise each day? _____

5. Do you exercise alone? Yes _____ No _____

If No, who do you exercise with? (check one):

Spouse _____
Friend _____
Son or Daughter _____
Other (specify) _____

6. Do you exercise to music? Yes _____ No _____

7. How many weeks have you been doing this exercise routine?
_____

8. Does it cost you anything to exercise?
(ie; YMCA, or other club memberships, equipment?).

Yes _____ No _____

9. Have you ever attended a "formal" exercise class? (with an instructor, for example areobics, Senior Energize, or Aqua Aerobics). Yes _____ No _____
If YES, please list the names of the classes and dates attended. _____
_____

10. Prior to your current exercise routine did you do any other form of "personal home exercise"? Yes ____ No ____
If YES, please fill out the grid below.
Check all activities that you participated in and check the frequency category that best describes your part--icipation.

	Less than once/month	1-3 times per month	once per week	2-3 times per week	4-6 times per week	Everyday
Walking						
Swimming						
Tennis						
Bowling						
Golf						
Biking						
Other						

APPENDIX F

Interview Guide

Interview Guide

The purpose of this study is to find out from a group of older adult exercisers, what they perceive the positive and negative effects of exercise to be. I am going to ask you a series of questions and I would like you to tell me all of your thoughts and feelings. You can take as much time as you need to answer each question.

1. What would you say are the positive effects of exercise?

   Probes

   What are the benefits of exercise for you?

   How do you feel when you're finished exercising?

   How do you feel on the days you don't exercise?

   Has your outlook on life changed since you started exercising?

   How do you feel about yourself? Has this changed since you started exercising?

   How do you feel about being over 65 years of age?

   Has this changed since you started exercising?

   Have you experienced any changes in your health since you started exercising? If so, what are they? (For example: weight loss, lower blood pressure, improved stamina, improved sleep).

   Does exercising regularly help you cope with the stressors in your life?

   Has exercising affected your ability to relax?

2. What would you say are the negative effects of exercise?

   What are the drawbacks of exercising?

   What unpleasant side-effects have you experienced as a result of exercising?

   How do you find time to fit exercise into your schedule?

   How much money do you spend on your exercise program?

APPENDIX G

Human Subjects

MICHIGAN STATE UNIVERSITY

UNIVERSITY COMMITTEE ON RESEARCH INVOLVING
HUMAN SUBJECTS (UCRIHS)
206 BERKEY HALL
(517) 353-9738

EAST LANSING • MICHIGAN • 48824-1111

February 19, 1990 **IRB# 90-071**

Tania D. VanDyke
319 S. Second St.
Grand Haven, MI 49417

Dear Ms. VanDyke:

RE: "WHAT ARE THE STATED POSITIVE AND NEGATIVE EFFECTS OF REGULAR EXERCISE IN A GROUP OF OLDER ADULTS **IRB# 90-071**"

The above project is exempt from full UCRIHS review. I have reviewed the proposed research protocol and find that the rights and welfare of human subjects appear to be protected. You have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to February 19, 1991.

Any changes in procedures involving human subjects must be reviewed by UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

Daniel A. Bronstein, S.J.D.
Vice Chair, UCRIHS

JKH/sar

cc: B. Given

APPENDIX H

Agreement Between Researcher and Expert

Agreement Between Researcher and Expert

The following is a table of the total responses by theme for each of the twelve interviews. Both the researcher's total, the expert's total, and the percentage agreement between researcher and expert are given.

R = Researcher
E = Expert
% = % agreement

Coding Themes	Case 1 R	Case 1 E	Case 1 %	Case 2 R	Case 2 E	Case 2 %	Case 3 R	Case 3 E	Case 3 %
1. Physical Performance	9	9	100	5	4	80	1	1	100
2. Health Maintenance/ Prevention	3	3	100	8	7	88	0	0	100
3. Well-being	18	16	89	9	9	100	7	6	86
4. Mental Alertness	3	3	100	0	0	100	0	0	100
5. Social Interaction	4	3	75	0	0	100	6	6	100
6. Social Value	2	3	67	2	2	100	1	2	50
7. Impaired Body Function	1	1	100	1	2	50	6	5	83
8. Attachment	6	6	100	0	1	50	0	0	100
9. Lack of Social Value	2	2	100	0	0	100	0	0	100
10. Lack of Social Support	0	0	100	0	0	100	0	0	100
TOTAL	48	46	96	25	25	100	21	20	95

Coding Themes	Case 4 R	Case 4 E	Case 4 %	Case 5 R	Case 5 E	Case 5 %	Case 6 R	Case 6 E	Case 6 %
1. Physical Performance	10	10	100	2	2	100	8	7	88
2. Health Maintenance/ Prevention	3	3	100	6	6	100	2	3	67
3. Well-being	14	14	100	5	5	100	4	3	75
4. Mental Alertness	1	1	100	0	0	100	0	0	100
5. Social Interaction	0	0	75	0	0	100	0	0	100
6. Social Value	2	1	50	1	0	50	0	0	100
7. Impaired Body Function	0	0	100	4	4	100	5	5	100
8. Attachment	0	0	100	0	0	100	0	0	100
9. Lack of Social Value	1	2	50	0	0	100	0	0	100
10. Lack of Social Support	0	0	100	0	0	100	0	0	100
TOTAL	31	31	100	18	17	94	19	18	95

Coding Themes	Case 7 R	E	%	Case 8 R	E	%	Case 9 R	E	%
1. Physical Performance	5	6	83	7	8	88	10	10	100
2. Health Maintenance/ Prevention	8	6	75	7	8	88	3	3	100
3. Well-being	22	20	90	8	8	100	13	13	100
4. Mental Alertness	0	0	100	0	0	100	0	0	100
5. Social Interaction	3	5	60	0	0	100	1	1	100
6. Social Value	1	1	100	2	1	50	3	1	33
7. Impaired Body Function	3	3	100	3	3	100	3	4	75
8. Attachment	0	0	100	2	2	100	2	3	67
9. Lack of Social Value	0	0	100	0	0	100	0	0	100
10. Lack of Social Support	2	2	100	0	0	100	0	0	100
TOTAL	44	43	98	29	30	97	35	35	100

Coding Themes	Case 10 R	E	%	Case 11 R	E	%	Case 12 R	E	%
1. Physical Performance	3	4	75	9	8	89	6	5	83
2. Health Maintenance/ Prevention	2	2	100	5	5	100	7	8	88
3. Well-being	13	13	100	15	14	93	13	13	100
4. Mental Alertness	0	0	100	2	2	100	0	0	100
5. Social Interaction	3	3	100	3	4	75	4	4	100
6. Social Value	1	1	100	2	2	100	2	3	100
7. Impaired Body Function	0	1	50	2	2	100	5	5	100
8. Attachment	0	1	50	4	4	100	0	0	100
9. Lack of Social Value	0	0	50	0	0	100	0	0	100
10. Lack of Social Support	0	0	100	0	0	100	0	0	100
TOTAL	22	25	88	42	41	98	37	38	97

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REFERENCES

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