



Lifelong fitness participation : reflections in the water
by Janet Marie Muller Trethewey

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University

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Abstract:

Two separate but connected phenomena have gained attention in the last few years. First is the recognition that regular exercise or fitness leads to a decrease in many diseases. Secondly, America is seeing a growing percentage of the population older than 65 years of age.

Even with the recognition that regular physical exercise decreases the incidence of disease and aids in "successful aging," less than 30% of the population exercises. Researchers have examined reasons for this lack of participation with little conclusive results. One model that attempts to explain both exercise participation and ways to improve participation is the Personal Meaning Fitness Education Model. Key components of this model are self-efficacy and comparison to the social norm.

From Bandura's Social Learning Theory it can be concluded that exercise is a type of learning. However, no researcher has examined the influence of learning patterns on fitness participants. Therefore, the purpose of this study was to describe the learning patterns of a group of individuals 60 years or older who are participating in fitness and exercise activities. These individuals have maintained a high level of fitness over their lifetime.

This research was a qualitative case study of nine individuals. Participants were interviewed to investigate their exercise lifestyle and learning patterns based on the Kolb LSI; the auditory, visual, and psychomotor modalities of learning; and the SKILLS.

Learning patterns did not reveal many clues as to why these people have continued to exercise throughout their lifetimes. Other factors, influenced by or related to learning such as awareness of the benefits of exercise, educational background, past lifetime experiences, self-directedness or intrinsic motivation, and enjoyment of life did influence their continued participation. Of these, the adult education concept of critical reflection is the most important. The participants of this study had critically reflected on their fitness activities and were aware of the benefit of exercise on their ability to maintain a chosen lifestyle.

The concept of critical reflection is teachable. If individuals reflect on the impact of exercise in their lives, they may be inclined to adopt a fitness lifestyle.

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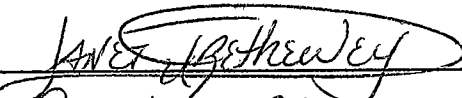
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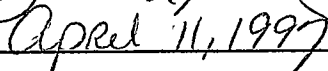
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ABSTRACT

Two separate but connected phenomena have gained attention in the last few years. First is the recognition that regular exercise or fitness leads to a decrease in many diseases. Secondly, America is seeing a growing percentage of the population older than 65 years of age.

Even with the recognition that regular physical exercise decreases the incidence of disease and aids in "successful aging," less than 30% of the population exercises. Researchers have examined reasons for this lack of participation with little conclusive results. One model that attempts to explain both exercise participation and ways to improve participation is the Personal Meaning Fitness Education Model. Key components of this model are self-efficacy and comparison to the social norm.

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This research was a qualitative case study of nine individuals. Participants were interviewed to investigate their exercise lifestyle and learning patterns based on the Kolb LSI; the auditory, visual, and psychomotor modalities of learning; and the SKILLS.

Learning patterns did not reveal many clues as to why these people have continued to exercise throughout their lifetimes. Other factors, influenced by or related to learning such as awareness of the benefits of exercise, educational background, past lifetime experiences, self-directedness or intrinsic motivation, and enjoyment of life did influence their continued participation. Of these, the adult education concept of critical reflection is the most important. The participants of this study had critically reflected on their fitness activities and were aware of the benefit of exercise on their ability to maintain a chosen lifestyle.

The concept of critical reflection is teachable. If individuals reflect on the impact of exercise in their lives, they may be inclined to adopt a fitness lifestyle.

CHAPTER 1

INTRODUCTION

Regular physical exercise has long been touted as the best method for preventing and curing a host of physical and emotional problems including heart disease, hypertension, type two diabetes, osteoporosis, colon cancer, and depression (Pate et al., 1995). Since the early 1970s, exercise has been promoted as an important aspect of a healthy lifestyle. However, the Centers for Disease Control reported that only about 22% of Americans engage regularly in physical activity that would produce a health benefit (U.S. Department of Health and Human Services [USDHHS], 1990). Low levels of habitual physical activity and low levels of physical fitness have been associated with markedly increased all-cause mortality rates (Pate et al., 1995). This means, regardless of the cause of death, lack of physical fitness is an important factor related to when a person dies and what a person may die from.

In the last decade, the realization that the population of this country is "graying" and the recognition that most people die due to diseases of lifestyle have refocused attention on physical fitness as a means to maintain personal health (Sharkey, 1990). Skyrocketing health care

costs have also motivated many to rethink their lifestyle, and to begin a fitness program (Sharkey, 1990). However, few maintain this commitment.

Much research has been done on the reasons individuals continue to exercise. Motivation, improvements in body image and self-esteem, and differences in personality have been examined as factors in maintaining an exercise program (Sharkey, 1990). None adequately explain why less than 30% of the population continue to exercise while the majority do not. In addition, learning patterns of exercisers have not been examined to determine their influence on the drop-out rate of fitness participants.

Researchers have looked at the influence of fitness not only on the decrease in mortality rates but also on the "successful" aging of an individual. At a time in their lives when they have more time to devote to exercise due to retirement and when they have the most need to prevent or slow the progress of diseases especially associated with aging, fewer older adults than ever are exercising (Pate et al., 1995). The major reason for a decline in physical activity is an increase in body fat. As body fat increases, activity declines, allowing for the deposits of more body fat. Thus begins a vicious cycle of decline in physical fitness as an individual ages (Davis & Stark, cited in Sharkey, 1990).

Contrary to the norm, some older Americans have maintained a high level of physical fitness through activity and exercise over a lifetime. This has enabled them to maintain a high level of activity and independence. They are less frequently plagued with debilitating diseases.

While research has focused on the physical aspects of exercise, efforts have not been undertaken to explore the learning process of those actively involved in an exercise program. If exercise and fitness are viewed as learning tasks, the individual learners/exercisers could apply learning style traits to the tasks. Learning styles are "cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1982, p. 44). Those involved in an exercise program could use their preferred patterns of learning to develop a fitness habit and continue it with modifications over a lifetime.

Cognitive learning style traits refer to "information processing habits representing the learner's typical mode of perceiving, thinking, problem solving, and remembering" (Keefe, 1982, p. 44-45). Again, this could influence how a person perceives or thinks about exercise and activity. If a person perceives exercise and fitness in a positive or pleasurable way, thinks it is beneficial, and remembers to

continue with it, a fitness lifestyle could be more likely to develop.

The Personal Meaning Fitness Education Model (PMFEM) focuses on the concept that fitness and exercise are habits developed by an individual and are built around a framework of personal meaning (Rehor, 1991). Individuals who adopt exercise or fitness activities into their lives require the intention to exercise stimulated by the perception of a need to exercise, the self-efficacy to achieve the desired goal of exercising, and the social norm to support this intention or the self-responsibility to overcome negative social norms. These three concepts influence the actual intention to exercise. Once the intent is acquired, individuals must actually attempt to exercise. If individuals continue to exercise, then they are said to have reached exercise adherence. The achievement of adherence results in the development of habit-forming behavior. Habitual behavior is an indication of learning (Merriam & Caffarella, 1991, p. 126).

Affective learning style traits are related to emotion, attention, values, and motivation. "The enjoyment or pleasure experienced during exercising has an important effect, both on self-efficacy and on subsequent intentions to exercise" (Rehor, 1991, p. 4). Family history and personal experience alter perception and thus influence learning (Keefe, 1982). If an individual is raised in a

family where activity is valued, it will cause a different perception of activity than for someone whose family was inactive. Differences in these vast learning experiences are an important component in maintaining an exercise lifestyle.

The physical aspects of learning style involve the senses with one or two preferred over the others (Dunn, Dunn, & Price 1979). Learners may prefer auditory, visual, or psychomotor stimulation. The learning of a task is influenced by the learning environment, which includes factors such as lighting, temperature, noise level, and comfort of position (Dunn, Dunn, & Price, 1979).

Cognitive learning style traits, affective learning style traits, and physical learning style traits all contribute to the way an individual learns. The combination of these patterns creates the unique way an individual learns. Individuals who are aware of their own pattern may be able to further capitalize on those patterns to further enhance learning (Conti & Fellenz, 1991).

Against this overwhelming social norm, there are people who are very dedicated to a fitness lifestyle. Some of them form a group of people who are mostly retirees of Montana State University--Northern (formerly Northern Montana College) or friends of the retirees. They are all 60 years of age or older. They attend an aqua exercise class held at the university pool that is sponsored by the Employee Wellness Program. This program is funded by the insurance

plan of the university. Its purpose is to reduce health care costs to the insurance plan through the reduction of disease risks.

The participants of this class are extremely regular in their attendance. They are active, busy, vital people who sought out the opportunity to attend this class. They may be retired, but they have not allowed advancing age the opportunity to slow them down--much. It is unknown how these people learn and how their learning is related to their participation in regular fitness activities including the aqua exercise class.

Statement of Problem

The medical evidence is overwhelming in support of physical fitness for the prevention of disease and disability, yet fewer than 30% of the population exercises at levels high enough to produce a health benefit (Center for Disease Control [CDC], 1996; Pate et al., 1995). Concurrently, the population demographics are changing. The segment increasing the most rapidly is the elderly (Fowles, 1994). The elderly are the largest consumers in the health care system, placing the greatest burden on the financing of the system (Fowles, 1994). Even with these dim predictions, there are those individuals of advanced age who are living healthy, productive lives and continue to participate in fitness activities.

Researchers have neither offered an explanation for lifetime participation in fitness activities nor addressed the underlying learning patterns that may influence the recognition of the long-term benefits of regular exercise. In addition, the link between long-term participation in exercise programs or lifetime fitness activities and learning patterns has not been established.

Purpose

The purpose of this study was to describe the learning patterns of a group of older individuals who were currently participating in fitness and exercise activities. These individuals have maintained a high level of fitness over their lifetime. The investigation of learning patterns was based on the learning styles framework of Kolb; the auditory, visual, and kinesthetic modalities of learning; and learning strategies based on the SKILLS framework.

Significance

Because it has been so pointedly recognized by the medical community that regular, vigorous exercise is important to the longevity and vitality of an individual, it is necessary to find ways to increase the total number of individuals who exercise as part of their daily routine. Currently, physical educators teach fitness as part of a physical education curriculum. This curriculum, for the most

part, is activity or psychomotor based; little time is spent on verbal or visual processing. Activities are taught as a means of improving motor skills rather than on application to a fitness lifestyle (Rehor, 1991). This method of instruction may alienate a large number of people with different learning patterns. Examining the learning patterns of those individuals who are physically active may give clues to better ways of teaching physical education and making fitness activities part of more people's lifestyles.

There are two distinct areas where physical activities are taught. One is the formal school setting and the other is in the adult world of the fitness industry which includes health clubs, fitness gyms, exercise classes, and doctor's offices. Since so few people are involved in regular exercise programs, those who are teacher-educators and fitness-educators need to re-think how exercise and fitness activities are taught to their students. Then, they may in turn do a better job of teaching fitness activities and exercise.

Little time is spent on explaining the "why" of physical education activities to students in the formal school setting (National Association for Sport and Physical Education [NASPE], 1995; Montana Office of Public Instruction [OPI], 1995). As with so many other things, the long-term does not mean much to a 16-year-old. Methods for making physical activity personally important to the

learners needs to be added to the curriculum. Increasing self-efficacy and adding exercise to a person's personal belief system can help maintain a lifetime of fitness through the creation of an exercise habit (Rehor, 1991).

Teacher-educators provide prospective teachers with the mechanics of teaching exercise, but do little to address the behavior changes needed for most learners to adopt a lifestyle of physical fitness (NASPE, 1995; OPI, 1995). By identifying the learning characteristics of lifelong fitness participants, this study may help teacher-educators and prospective teachers make curricular changes in physical education programs by revising the philosophical basis upon which the program is based. Physical education and movement skills are only a portion of the pie. These skills are not a means to an end, but a single part of the necessary foundation for a healthy lifestyle (OPI, 1995). The "why" allows learners the opportunity to understand the need for fitness activities within the framework of a healthy whole. Physical education thus becomes part of the foundation of a health enhancement model rather than standing as its own entity (OPI, 1995).

Information on the connection between learning patterns and physical activity may also help physicians and others in the health care field address the physical fitness needs of their patients. To simply tell most people to get some exercise obviously is not enough. Addressing the

self-efficacy and personal belief systems of an individual in conjunction with preferred learning styles may provide health care professionals with the ability to design not only the fitness plan but also the cognitive approaches necessary to make it happen as well. Concurrently, those adult educators in health clubs and other fitness settings can also improve adherence to exercise by their clients by recognizing the importance of learning patterns in the development of intent and initiation of exercise.

Further, for those individuals who would like to begin an exercise program, a clearer understanding of those components used by successful exercisers may help them. For those individuals who have tried to exercise and were not able to maintain that commitment, understanding those things necessary to be successful will assist in the improvement of their self-efficacy. Since the majority of adults are self-directed in their learning efforts and not necessarily interested in joining a fitness club or exercise class, a clearer picture of the components of a successful exercise program may help in the formation of their own plan. This could ultimately lead to increased adherence to fitness by a larger percentage of the population.

Research Questions

Several research questions were addressed in this project. These questions included:

1. What are the learning patterns of this group of exercisers?
2. What commonalities do participants share in their learning patterns?
3. How do participants' learning patterns contribute to their lifelong participation in fitness activities?
4. Are there other patterns that contribute to their continued participation in exercise activities over a long period of time?
5. What caused these patterns to exist?

Definition of Terms

Aging: The gradual decline in bodily functions, cognitive functioning, and increased incidence of disease or infirmity (Fowles, 1994; Porterfield & St. Pierre, 1992; Spence, 1989).

Critical Reflection: A process by which the adult learns to become aware of and to evaluate his experience (Lindeman, cited in Knowles, 1970, p. 51).

Exercise: A specific type of physical activity defined as "planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness" (Pate et al., 1995).

Learning: "A change of state of the human being that is remembered and that makes possible a corresponding change in the individual's behavior in a given type of

situation. . . . [It] is brought about by one or more experiences that are either the same as or that somehow represent the situation in which the newly acquired behavior is exhibited" (Gagne, 1984, p. 377).

Learning Patterns: A combination of qualities, acts, or tendencies forming a characteristic arrangement for learning.

Learning Strategies: The external behaviors developed by an individual through experience with learning which the learner "elects to use in order to accomplish a learning task" (Fellenz & Conti, 1989, p. 7).

Learning Styles: "Cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment" (Keefe, 1982, p. 44).

Lifelong Fitness: The condition in which individuals over 60 years of age have maintained a high level of physical fitness throughout the majority of their adult life. Through either general physical activity or planned exercise programs.

Lifelong learning: A lifelong process of discovering what is not known (Knowles, 1970, p. 38).

Physical Activity: "Any bodily movement produced by skeletal muscles that results in energy expenditure" (Pate et al., 1995).

Physical Fitness: Simply the body's ability to perform physical work. Both physical activity and planned exercise can lead to or maintain physical fitness. A plethora of studies have demonstrated that "physically active adults, as contrasted with their sedentary counterparts, tend to develop and maintain higher levels of physical fitness" (Pate et al., 1995).

Physical Fitness Program: A program designed or established for an individual to provide the opportunity for physical activity to promote fitness.

Self-directed Learning: A process in which individuals take the initiative in designing learning experiences, diagnosing needs, locating resources, and evaluating learning (Knowles, 1984).

Limitations

This study was conducted in Havre, Montana, a community of about 12,000 people. There are several organized activities within the community available for the older population. These classes are sponsored by Montana State University--Northern, Northern Montana Hospital, the city recreation department, and the senior citizens' center. Due to the large number of potential participants from all of these programs, only those enrolled in the university aqua exercise class were selected. Further, no attempt was made to include those individuals who exercise without

participating in an organized class or group. The activity class selected was a pre-existing group. No attempt was made to pre-select participants into the class prior to the study.

The researcher was acquainted with most of the participants and knew some of them very well. Because of the size of the community, they also knew each other well. Some had even worked together previously.

Assumptions

Even though the participants were enrolled in this specific class, they were all participating on a voluntary basis and had the ability to choose from any of the available classes in the community. It is assumed that the type of exercise, therefore, does not affect the learning patterns. It is further assumed that learning patterns can be derived from a discussion of life activities, including fitness participation.

CHAPTER 2

REVIEW OF THE LITERATURE

Learning

Several definitions of learning have developed since learning as a phenomenon has been studied by psychologists and educators. The most basic definition of learning is to say "learning is a change in behavior" (Merriam & Caffarella, 1991, p. 126). However, this reflects a decidedly behavioristic bent. For many years this theory held sway with psychologists. Many students of learning have found this concept was too limiting. Consequently, several alternative views of learning have developed. These include social learning theory, cognitive theory, and humanistic theory.

Social Learning Theory

Behaviorist theory began with John Watson in the late 1800s (Berger, 1994, p. 42-43). He argued that for psychology to become a science, it must be based on theory, and psychologists should study only that which was measurable and observable. From this perspective, only the behaviors of an individual could be observed and measured. The basic laws of behaviorism are concerned with the

relationship between a stimulus and the response to that stimulus. A third component of this stimulus-response reaction is the concept of conditioning. This means that "a particular response becomes conditional upon a particular stimulus" (p. 43). There are two types of conditioning: classical and operant.

The Russian scientist Ivan Pavlov and his now famous experiments with dogs illustrate the concept of classical conditioning. By ringing a bell every time the dogs were fed, the dogs began associating the bell (a neutral stimulus) with the food. Soon a response (salivating) could be elicited without the presence of any food at all (Berger, 1994, p. 43).

Another proponent of behaviorism was B. F. Skinner. He was instrumental in developing the concept of operant conditioning:

In operant conditioning, the organism learns that a particular behavior produces a particular consequence. If the consequence is useful or pleasurable, the organism subsequently repeats the behavior to achieve that consequence again. If the consequence is unpleasant, the organism will not repeat the behavior. (Berger, 1994, p. 44)

The first expansion away from this strict behaviorist view was done by Hull and later by Bandura. Their theories and other similar theories have been classified as Neobehaviorism by Dubin and Okun (1973). The Neobehaviorist theory of Bandura is referred to as Social Learning Theory. A key component of this theory is that observational

learning is an important component of changing behavior and thus of learning (Lasker, Moore, & Simpson, 1980, p. 48).

"Virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of other people's behavior and its consequences for the observer. . . . Persons can regulate their own behavior to some extent by visualizing self-generated consequences" (Merriam & Caffarella, 1991, p. 135).

Proponents of social learning theory suggest that human behavior is transmitted either deliberately or inadvertently and largely through exposure to social models (Bandura, 1971, p. 1). Social learning theory goes beyond basic behavioralism in the fact that cognitive function is involved in modeling observed behavior (p. 16). Modeling may be in physical, verbal, or written form.

There are four components to Social Learning Theory as proposed by Bandura. First are the attentional processes. An individual must pay attention to modeling in order for learning to occur. This must be done in some sort of discriminate manner.

Second are the retention processes; this is the ability to retain and recall modeling at some later time and still perform appropriately. Retention includes mental rehearsal and the use of memory skills.

Physically reproducing a behavior or set of behaviors with or without verbal coaching is the third component. It

is called motoric reproduction. Motoric reproduction includes physical action as well as symbolic reproduction in verbal or written form.

The fourth component is concerned with reinforcement and motivational processes. These are the positive or negative conditions that may influence the implementation of an observed behavior. Reinforcement and motivation also influence the attention paid by an individual to any particular modeling. The internal or external motivational factors that influence an individual also affect the learning process.

Not all human behavior is controlled by immediate external reinforcement. People regulate their own actions to some extent by self-generated anticipatory and self-evaluative consequences. At this higher level of psychological functioning, people set themselves certain performance standards, and they respond to their own behavior in self-rewarding or self-punishing ways, depending on whether their performances fall short of, match, or exceed their self-imposed demands. After a self-monitored reinforcement system is established, a given performance produces two sets of consequences--a self-evaluative reaction as well as some external outcome. In many instances self-produced and external consequences may conflict, as when externally approved courses of action, when carried out, give rise to self-devaluative reactions. Under these circumstances, the effects of self-reinforcement may prevail over external influences. Conversely, response patterns may be effectively maintained by self-reward under conditions of minimal external support or approval. (Bandura, 1971, p. 47)

Cognitive Theory

Cognitive theory arose from the perceived inadequacies of behavioralist and neobehavioralist theories to adequately explain learning. Cognitivist theory comes from Gestalt psychology and places the locus of control for learning with the individual and not the environment. Cognitive theory relies on "three almost simultaneous processes:

(1) acquisition of new information; (2) transformation, or the process of manipulating knowledge to make it fit new tasks; and (3) evaluation, or checking whether the way we have manipulated information is adequate to the task"

(Knowles, 1984, p. 28). "Cognitive theories remind us that 'intelligence' involves many factors that are not easily summarized in an IQ score, and reflects the remarkably diverse and complex skills and strategies that people evolve through their interactions with the surrounding world"

(Berger, 1994, p. 58)..

Probably the most well known Cognitivist is Jean Piaget (Berger, 1994). While helping develop the first IQ tests, he became fascinated with the fact that children at different ages answered the questions wrong in a consistent pattern. He began to ask "why?" From this came Piaget's Stages of Cognitive Development Theory. This theory explains cognitive development by evaluating the intellectual growth of an individual from infancy to adulthood. This theory allows for the movement away from simple behaviorism and social

modeling to the exploration of the internal processing of the mind required for learning.

Critics have said that Piaget's theory is too lock-step and limiting (Berger, 1994, p. 58). They also have noted that not all adults reach the final cognitive step of Formal Operations, which requires abstract thought. A further criticism is that Piaget ignored the obvious influence of social learning on the development of children.

Even with these limitations, Piaget's theory has greatly influenced the way children are educated (Berger, 1994, p. 58). Children are taught concepts within a framework of where they are cognitively at that time in their lives. For example, elementary math is taught with manipulatives to assist children in the Concrete Operations stage. This is because children at this stage need something concrete or physical to see and manipulate to understand a concept.

Humanistic Theory

A third group of theorists are the Humanists. Carl Rogers and Abraham Maslow are the primary proponents of Humanistic Theory. They believe that learning is neither controlled by the environment nor is it an automatic mental processing of information. Instead, learning is within the control of the individual. Humanism

emphasizes a person's perceptions that are centered in experience, as well as the freedom and

responsibility to become what one is capable of becoming. These tenets underlie much of adult learning theory that stresses the self-directedness of adults and the value of experience in the learning process. (Darkenwald & Merriam, 1982, p. 132)

Further, this theory suggests that "no one can be taught, but rather that learning is self-directed through the purposeful pursuit of human needs, the satisfaction of which maintains the human organism in a balanced state" (Lasker, Moore, & Simpson, 1980, p. 50).

Maslow developed a hierarchy of universal human needs (Berger, 1994). The very basic needs are for food, sleep, safety, and shelter. Higher needs are for love, acceptance, and esteem and cannot be reached if lower level needs are not met. The highest level is achieved by few people and is what Maslow calls self-actualization (p. 60). People who become self-actualized are called Transcenders. They exhibit common traits such as being "realistic, creative, spontaneous, self-accepting, spiritual, independent, and purposeful" (p. 59).

Rogers agreed with Maslow and felt that all people, even children, strive to become fully functioning. This means living and working at their potential. To achieve full functioning "significant others" need to provide "unconditional positive regard" (Berger, 1994, p. 60). For example, parents give unconditional positive regard by providing children with a safe environment in which to

express feelings without fear of ridicule or humiliation for doing so.

Both Maslow and Rogers felt that children could work toward these goals of self-actualization and full functioning, but they would probably not attain them until adulthood (Merriam & Caffarella, 1991). Thus, Humanistic theories become important in adult education practice. Humanistic theories are not without detractors. Critics accuse humanists of viewing the world through "rose colored glasses" and of being "too optimistic" (Berger, 1994, p. 61).

Learning Styles

These varied learning theories still do not answer all of the questions of how an individual learns and under what conditions learning occur most readily. Thus, researchers have begun to look beyond these theories to other causes or patterns for learning. Studies have examined "between-group differences such as racial differences, sexual differences, and social class differences" (Ivey, 1992, p. 38). These studies have developed theories about the innate processes by which someone learns. There are three terms used interchangeably about the way individuals learn; yet, there are subtle differences in the terminology. Learning style, as defined by Entwistle, is "information processing routines that function in a trait like manner at the personality

level"; learning strategy is the "cross-situational consistency in how students approach learning"; and a learning tactic, according to Snowman, is a "specific, observable activity of learners in a specific learning situation" (Curry, 1990, p. 51).

Learning styles are the "cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment (Keefe & Ferrell, 1990, p. 57). Several instruments have been developed to measure learning style. However, "style instruments do not have a good reputation for reliability and validity. Furthermore, some do not have a strong theoretical framework" (Bonham, 1989, p. 35). Since most learning style measures are self-report instruments, their accuracy is dependent upon people knowing themselves and upon them being willing to reveal that knowledge (p. 12). While many of the learning style instruments have inherent weaknesses, the "arguments against different learning style instruments are based on several grounds. Often instruments are not judged on their own merits but on what the critic wishes the instrument were like" (Ivey, 1992, pp. 45-46).

Nine learning style instruments with reported validity and reliability have been analyzed (Curry, 1990). In this content analysis, the nine instruments were placed in a three-level, concentric hierarchy. The center theories

describe cognitive personality and include Witkin's Embedded Figures Test and the Meyer's-Briggs Type Indicator. The middle level is reserved for those instruments that examine how individuals process information. Included in this level is Kolb's Learning Style Model. The instruments that evaluate instructional preferences and learning environment, including the Dunn and Dunn Learning-Style Inventory (LSI), fall into the outer level of the hierarchy.

Although these nine instruments have psychometric acceptability (Curry, 1990), all have still met with some criticism. For example, the Witkin's Embedded Figures test has been questioned regarding its ability to test what it claims (Marshall, 1995). The Dunn and Dunn LSI has been called into question because it measures the "least stable" element of learning style and thus is the most easily altered (Gorham, 1986, p. 416). Thus, while the concept of learning styles is useful for understanding and analyzing the learning process, care must be taken in the selection of instruments for measuring this style.

Kolb's Learning Style Framework

David Kolb has based his Learning Styles Model on a learning-process model called the "Experiential Learning Model" (Kolb, 1974). The model is based on a four-stage cycle starting with a concrete experience the individual reflects upon. This reflection causes the formation of new

generalizations. The individual then applies these generalizations to new experiences, which causes new concrete experiences.

This model, developed by Lewin, postulates that learning involves a series of steps along two poles placed perpendicularly to each other (Knaak, 1983). The first pole places concrete opposite of abstract, and the second pole places active opposite reflective (see Figure 1). The vertical dimension describes the way people perceive information; on one end are those who prefer concrete experiences opposed to those who prefer abstract thinking on the other end. The horizontal dimension describes the way individuals process information and add it to their knowledge base; some prefer reflecting and observing to process the information while others seek to actively work with the information to assimilate it.

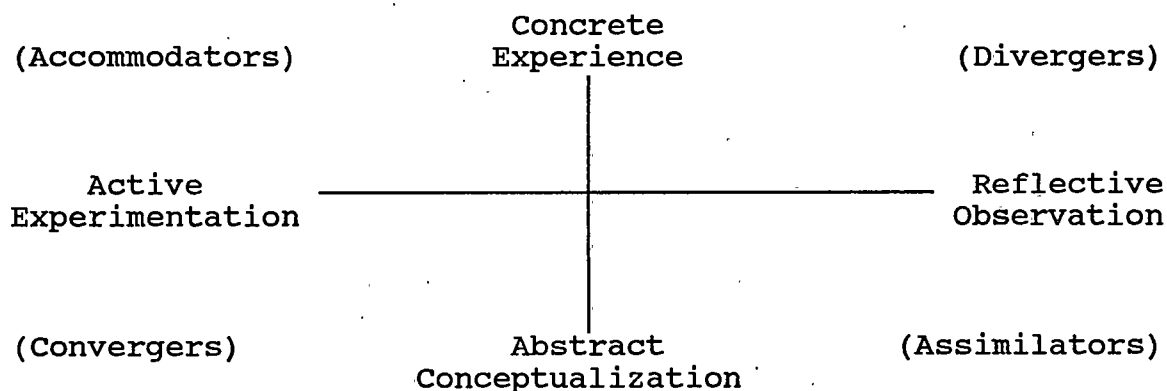


Figure 1. Kolb's Four Learning Styles.

The four quadrants formed indicate the types of learning styles adopted by individuals as they move between the two poles. While not wanting to label or categorize an individual as always being a particular type of learner, Kolb (1985) did list common "traits" of learners in each quadrant. Again, these categories of learners are on opposite ends of a continuum.

Two of the styles defined by Kolb are Convergers and Divergers. Convergers tend to be analytical; they prefer to deal with theory over people. These are the people who tend to do well on standardized tests as they like having one correct answer to a problem; the stereotype of this group is the scientist. Their opposites are Divergers. These people tend to generate ideas, but do not necessarily want to find solutions. They prefer to deal with people over theory. Many times these individuals do not do well on standardized tests, but they show high levels of critical thinking skills; the stereotype of this group is the artist.

Kolb's other set of opposite traits are the Assimilators and the Accommodators. Assimilators are the thinkers who are theory builders. They like to work with ideas rather than people; the stereotype of this group is the mathematician. Accommodators are people oriented. They are the doers and the practitioners; the stereotype of this group is a business person or teacher.

Kolb (1985) says that even though people may operate in all four quadrants to a certain degree, they prefer one over the others the majority of the time. These styles cannot be completely separated because they are connected along the two continuums. Ivey (1992) identified individuals who were most extreme in their orientation to one learning style. This was only a small percentage of the total sample tested, again demonstrating that most people are not rigidly fixed in one learning style. This may partially explain the poor predictive quality of learning style determination of student success (Bonham, 1989).

Dunn, Dunn, and Price Model of Learning Style

One of the strongest proponents of learning style and teaching children through preferred learning style is Rita Dunn. Her early research was done with children. Later, with the help of Kenneth Dunn and Gary Price, they developed an instrument to evaluate adult learning styles. In their definition of learning style, they examine 23 elements that affect how people concentrate on, process, absorb, and retain information (Dunn, 1988). These elements are divided into five areas: (a) the instructional environment (noise, lighting, temperature, and furniture design); (b) emotionality (motivation, persistence, responsibility, and need for external or internal structure); (c) the people with whom one learns most easily (alone, pairs, peers,

authoritative or collegial adults, and with variety or patterns of others); (d) physical characteristics (perceptual strengths, energy levels during the day, intake needs, and mobility requirements); and (e) psychological or cognitive inclinations (global/analytic, hemispheric style, and impulsive/reflective) (p. 306).

"No one is affected by all 23 elements of learning style. . . . Most students respond strongly to between 6 and 14; a few are strongly influenced by fewer or more" (Dunn, 1988, p. 307). Most people can identify those elements that are important to them and their preferences are their learning style strengths (p. 307). Most individuals can learn through several styles, but they learn easier through some over others (p. 304).

Learning style preferences appear to change as people mature. Young children are psychomotor learners, preferring tactile (through manipulatives and a hands-on approach) or kinesthetic (through whole body, activity-oriented experience) styles. This gradually changes to a visual preference and finally to an auditory preference. Some learners always retain a preference for the psychomotor learning styles, which makes learning that requires a visual or auditory style more difficult (Dunn, 1988, pp. 305-306). Again, this evaluation of learning style is in the outermost layer of learning and is the least stable as it does change and is more flexible in individual application (Ivey, 1992).

Learning Strategies

Learning strategies are the external behaviors developed by an individual through experience with learning which the learner "elects to use in order to accomplish a learning task" (Fellenz & Conti, 1989, p. 7). Five areas of learning strategies have been identified (Conti & Fellenz, 1991). Determination of the learning strategies used by an individual is done through the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS). This instrument has shown to be a reliable and valid instrument for assessing learning strategies (Conti & Fellenz, 1991; Kolody, 1997; Kolody & Conti, 1996).

The first learning strategy is Metacognition: knowing about and directing one's own thinking and learning process. The second is Metamotivation: awareness of and control over factors that energize and direct (motivate) learning. Third is Memory: the storage, retention, and retrieval of knowledge. Fourth is Critical Thinking: a reflective thinking process utilizing higher order thinking skills in order to improve learning. The fifth area is Resource Management: the process of identification, evaluation, and use of resources relevant to the learning task. Individuals can be taught to use any and all of the learning strategies, but through trial and error they use a collection of strategies that have provided success in the past (Conti & Fellenz, 1991).

Research has revealed five distinct sets of learners based on their preferred choices of learning strategies (Kolody, 1997; Kolody & Conti, 1996), and related research supports these general groupings (Lockwood, 1997). One group has been identified as the Navigators. They are very focused learners who plan their learning, chart a course for success, organize themselves and their resources, and then set about following this course of action. They are very goal oriented, make good use of organizational skills to restructure information, and they use lists and memory aids to stay on course.

Monitors are very cognizant of their learning and closely monitor their progress. They are similar to Navigators, but they pay close attention to their progress by comparing it to standards which may be either external or internal, as well as to previous learning. They make good use of resources and do well at testing assumptions. They also maintain direction by carefully planning when, where, and how to study.

Critical Thinkers rely heavily on all of the strategies for critical thinking; they test assumptions, generate alternatives, and practice conditional acceptance. Conditional acceptance is the practice of assuming something to be true but maintaining an open mind to other solutions. They are cognizant of their learning progress and also use organizational skills such as lists. They are very good at

identifying resources and like a learning environment that encourages practical experience and hands-on activities.

Engagers are passionate learners who are emotionally engaged in learning for the sake of learning and are confident in their abilities. They monitor and adjust their learning to accomplish goals, but these usually are internal rather than external expectations. These learners place a high value on the emotional relationship between the learner, the task, the environment, and the teacher.

Another group are the Networkers; these are the people learners. They rely heavily on dialogue, discussion, and networking with others to generate opinions and insights. These learners also initiate learning for internal rather than external reward, and many times, the process is more important than the product. They usually use organized memory strategies to store and retrieve information.

Characteristics of Adult Learners

Several characteristics of adult learners have been identified. Malcolm Knowles (1970) has coined the term "adragogy" to separate the process of addressing the needs and preferences of adult learners from the pedagogy of teaching children. Knowles has identified four salient features of adulthood:

1. As a person matures his or her self-concept moves from one of a dependent personality toward one of a self-directing human being;

2. An adult accumulates a growing reservoir of experience, a rich resource for learning. For an adult, personal experiences establish self-identity and so are highly valued;
3. The readiness of an adult to learn is closely related to the developmental tasks of his or her social role; and
4. There is a change in time perspective as individuals mature, from one of future application of knowledge to immediacy of application; thus an adult is more problem-centered than subject-centered in learning. (p. 39)

Knowles also qualifies self-directed learning "to describe a form of study in which people take the primary initiative, with or without the help of others for planning, conducting, and evaluating their own learning activities" (Merriam & Caffarella, 1991, p. 208).

Cyril Houle (1961) identified three separate learning orientations of adults: (1) goal-oriented learners who use education as a means of achieving some other goal, (2) activity-oriented learners who participate in education for the sake of the activity itself and the social interaction, and (3) learning-oriented participants who seek knowledge for its own sake. Houle was careful to point out that these were not pure types: "The best way to represent them pictorially would be by three circles which overlap at their edges" (p. 16).

Another characteristic of adult learners is the origination of their motivation to learn. Many adult educators support the concept of intrinsic motivation.

Perhaps more than any other characteristic of humanist education, intrinsic motivation characterizes adult learners. In most adult educational settings, the adult learners are there, not because they have to be, but because they want to be. Most adult students engage in learning activities under no compulsion except that which is generated from within. (Elias & Merriam, 1980, p. 127)

Allen Tough (1978) examined adult learners and found "a great number of adults are engaged in individual learning projects. Probably 90% of the adult population conducts at least one major learning effort per year and 73% of the projects are self-planned. Most adults are indeed self-directed and independent" (p. 256).

Thus, the major characteristics of adult learning suggest that adults do differ from children in the ways they approach, direct, plan, and accomplish learning. Adults are self-directed, have a vast experience base to draw upon, undertake learning for immediate application, are intrinsically motivated, and continue to learn throughout the life span.

Aging

Without a doubt, the population of this country is aging. The Administration on Aging, U.S. Department of Health and Human Services, estimates that currently there are 32.8 million persons age 65 and older. By the year 2030, this figure will more than double to 70.2 million, and the elderly will comprise 20% of the total population (Fowles, 1994).

Within this age group are some interesting trends as well. The 65-74 age group (elderly or old) is growing, but the 75-84 (very old) group and the 85 and older group are growing at much faster rates. This means that the old are getting older. In the mid-fifties, it was an oddity for someone to reach the age of 100. Today, it is such a common occurrence it is hardly newsworthy (Fowles, 1994; Porterfield & St. Pierre, 1992; Spence, 1989).

These advances in age do not come without cost, however. Approximately one-third of older persons assess their health as fair or poor. Older persons average 35 days of restricted activity due to illness or injury each year with 15 of those days confined to bed. While they currently account for only 12% of the population, the elderly account for 35% of all hospital stays and account for more visits with physicians than those younger than 65. Total health care expenditures per year averaged \$5,360 per person for those 65 and older (Fowles, 1994).

Most older persons have one and many have multiple chronic conditions. The most common condition is arthritis. The next most common conditions in descending order are heart disease, hearing impairments, orthopedic impairments, cataracts, sinusitis, diabetes, tinnitus (ringing in the ears), and visual impairments. Of these, only heart disease and diabetes are conditions that may be life threatening. The others limit the quality of life without directly

increasing mortality (Fowles, 1994; Porterfield & St. Pierre, 1992; Spence, 1989). These conditions can cause limitations in performing tasks ranging from food shopping, managing money, and doing housework to eating, bathing, dressing, walking, and using the toilet. These conditions and difficulties with living tend to increase with age; those with the most difficulties are usually in the oldest age group (Fowles, 1994; Spence, 1989).

Several theories have been proposed as to why the human body ages. Theories fall into essentially two types: Aging due to damage or wearing out and genetically programmed aging (Porterfield & St. Pierre, 1992; Spence, 1989). Theories based on the idea that the body ages due to damage or wearing out include Aging by Program Theory, Gene Mutation Theory, Cross-linkage Theory, Free Radical Theory, Cellular Garbage Theory, and the Autoimmune Theory. The basic premise of these theories is that due to errors or damage during cell replication, the cells become unable to perform their function or are thought to be foreign by the body and destroyed. This leads to poor function of organ systems and decline of the body as a whole. Also, as the cells' function diminishes, the body is no longer able to ward off infections (Neuhaus & Neuhaus, 1982; Porterfield & St. Pierre, 1992; Spence, 1989).

Genetically programmed theories propose that the body is genetically programmed to wear out. These theories

suggest that there is a limited number of times a cell can divide before it is no longer able to replicate and thus dies. Other theories suggest that there is an area in the brain as yet unidentified that begins to decrease stimulation of hormone production that leads to cell deterioration (Porterfield & St. Pierre, 1992; Spence, 1989). Again, this cell death results in diminished function of the organ system and ultimately, in the functioning of the body. No theory adequately explains all of the factors involved in the aging process of the human body.

Though no one knows exactly why humans age or what controls the aging process, there are several factors that are involved in how an individual ages. The first is genetic. Some individuals are predisposed to living longer, being more resistant to illness, and being able to weather the storm of time. Others are not so lucky; genetically they are programmed for a myriad of complex interactions within the body that weaken the immune system, predispose a person to certain diseases, or cause unhealthy accumulations of toxic or otherwise harmful substances within the body that lead to an early demise. Why this happens is simply fate (Berghorn & Schafer, 1991; Fowles, 1994).

A second factor in the process of aging is lifestyle. Until the advent of medicines such as antibiotics and sulfa, most people prior to the turn of this century died of infectious conditions or died within the first year of life

due to inadequate pre-natal and post-natal care (Sharkey, 1990). Now, humans are living an average of 23 years longer than their predecessors (Fowles, 1994; Porterfield & St. Pierre, 1992). This is due mainly to the aforementioned medical advances. Coupled with the decline in manual labor and the increase in sedentary jobs, more and more people are dying from "diseases of lifestyle." The most significant of these are cardiovascular disease and cancer.

Part of the reason for this is the physiology of the diseases. They require years to progress to the point of causing illness and death. In earlier times, something else killed people before these diseases could. More significant is the link between lifestyle and these diseases. Diets high in fat, low in fiber, and high in sodium are directly linked to cardiovascular disease. Smoking and exposure to the sun lead to the majority of cancers, although diet is also implicated in the formation of various cancers. While there is some genetic predisposition, the acceleration of these diseases in the population can only be attributed to lifestyle (Porterfield & St. Pierre, 1992; Sharkey, 1990).

A third factor in the aging process is the socio-economic status (SES) of the individual (Porterfield & St. Pierre, 1992; Schaie & House, 1992). Those individuals with the highest SES are least affected by the cost of health care at the end of life and are more able to afford health care to limit the effects of aging. Low SES is also

associated with factors that limit health and speed the aging process such as smoking, drinking alcohol, poor nutrition, lack of social support, lack of self-efficacy or self-directedness to change life situation, and chronic and acute stress (Schaie & House, 1992). This is not to say that all individuals with a low SES are in poor health, but the two are highly correlated. Life occupation greatly influences SES, and those with manual jobs are more prone to on-the-job injuries and exposure to hazardous substances (Porterfield & St. Pierre, 1992).

While it is true that everyone must die sometime, the concern is not death itself but the quality of life prior to death. It is estimated the average individual will spend 80% of his/her lifetime health care monies in the last two years of life (Fowles, 1994; Schaie & House, 1992). Contrary to popular opinion, only the most ill and elderly of this population are in some sort of long-term care facility. The majority of those 65 and older remain at home either with or without assistance. People move into a nursing facility only when disease and disability create conditions that can no longer be coped with at home (Fowles, 1994; Neuhaus & Neuhaus, 1982; Porterfield & St. Pierre, 1992).

Aging and Learning

The majority of researchers in recent years suggest that deterioration of cognitive ability with advancing age

is minimal. "The differences that do appear are more readily attributed to processes of perception, set, attention, motivation, and the physiological state of the organism . . . than to a change in the primary capacity to learn (Birren, cited in Darkenwald & Merriam, 1982, p. 109). There does not appear to be a decline in intelligence with age. Although many people 65 and older show some decline in abilities, more than half display no such change even at the oldest age levels (Merriam & Caffarella, 1991, p. 153).

Whether or not learning deteriorates with advancing age is due to an interrelationship of cognitive and noncognitive variables.

Noncognitive factors may hinder or facilitate a person's performance in a learning task but are not related to inherent learning ability. Among these noncognitive factors are: (1) pacing (speed)--the time a person has to examine a problem or to respond to a situation; (2) meaningfulness--how personally relevant or familiar material is makes a difference in learning; and 3) motivation--the extent to which an adult is motivated affects learning. The cognitive variables are associated with competence or true learning ability: (1) organization--the ability to organize material into manageable units; (2) mediation--the ability to relate two or more elements of a learning activity; and (3) rigidity and cautiousness--a multidimensional concept that refers to the amount of flexibility a person has to make appropriate cognitive responses. (Botwinick, cited in Darkenwald & Merriam, 1982, p. 109)

Other factors that affect learning with age include interference, physical condition, social class including educational level, and personality (p. 109). While many

studies have shown decreases in cognitive ability with age, evaluation of learning processes within the setting of the real world do not reveal such vast differences (Berger, 1994). This is probably due to the individual's ability to compensate for deficits in one area by using all areas of cognition, something usually controlled for in scientific experiments (p. 625).

Fitness and Exercise as a Learning Activity

Several models have been proposed from the field of psychology to explain the adoption of and adherence to a fitness lifestyle. All but one are incomplete, but they are useful in providing background into the development of the others.

Health Belief Model. The Health Belief Model suggests that individuals participate in health behaviors based on the perception they can prevent or control some disease that is a threat to personal health. This model is based on the premise that individuals will decide to change health behaviors if an event prompts them to action (Godin & Shephard, 1990). This increased awareness of the need to participate in a fitness activity is called exercise intention. On its own, this model shows little evidence of actually changing a person's behavior. It may increase intention to exercise, but the actual practice is limited.

Simply wanting to change a behavior is not enough to cause a person to do so. With Rosenstock's addition of Bandura's theory of self-efficacy, the model becomes more applicable to exercise adoption. Behavior change requires a strong sense of self-efficacy and an ability to overcome real and/or perceived barriers (Godin & Shephard, 1990).

Protection Motivation Theory. Protection Motivation Theory by Maddux and Rogers (1983) is similar to the Health Belief Model. It proposes that motivation (intention) to protect oneself from disease or illness depends upon four factors: perceived severity of the disease or illness, perceived probability of contracting the disease or illness, efficacy of recommended preventative behavior, and perceived self-efficacy. This theory does not go beyond increased intention to the actual practice of new behaviors.

Social Cognitive Theory. The Social Cognitive Theory is based on the work of Bandura (1977). Social Cognitive Theory "views human behavior in terms of a model of triadic reciprocity in which behavioral, cognitive, and other personal factors and environmental events all operate as interacting determinants of each other" (Schuster, Petosa, & Petosa, 1995, p. 15). Bandura believes all behavioral changes are mediated by a common cognitive mechanism called self-efficacy. This is learned through personal experiences and the modeling provided by others. It is not the

individual's expectations of the outcome such as exercise adherence or weight loss of a particular behavior change that is so important as is the individual's perception that one can successfully carry out the particular behavior change. While Bandura feels that both of these are factors in behavior change, the latter is the more important component (Godin & Shephard, 1990). Other considerations included in this theory are knowledge, social support, enjoyment, social norms, benefits (expectancies), and barriers (Schuster et al., 1995). Like the previous theories and models, this theory does not go beyond intention to the implementation of a behavior; the inclusion of self-efficacy does increase the motivation of an individual to make the move from intention to practice, but still does not address application.

Stages of Change Theory. The Stages of Change Theory recognizes there are five stages individuals move through on the road to behavior changes (Prochaska & DiClemente, 1982). The first stage is precontemplation which means not planning on making a change. Contemplation is another term for intention; thinking about making a change. Preparation is moving toward making changes by actually making small changes in attitude or behavior. Action is the actual implementation of a behavior, while maintenance is continuing that behavior over time.

A set of 10 change processes has been identified. These processes are important components of the Stages of Change Model. The 10 processes of change are (1) consciousness raising, (2) self-liberation, (3) dramatic relief, (4) counterconditioning, (5) stimulus control, (6) helping relationships, (7) environmental reevaluation, (8) social liberation, (9) self-reevaluation, and (10) reinforcement management. Different stages use different processes for successful completion (Prochaska & DiClemente, 1992).

Consciousness raising is simply becoming aware of the need to change, usually through education or some threat to the individual. Self-liberation is the creation of additional options due to the increased awareness of other alternatives, usually from education; social liberation is the increase of options due to changes in society that create additional alternatives. For example, if an individual became aware of the benefit of exercise, consciousness would be raised, thus increasing intention. Hearing about the opening of a new health club would increase self-liberation, while an employer's offering flex time to exercise would be social liberation.

Dramatic relief is the recognition and release of negative emotions, thus allowing that energy to be used for change. From the example above, this would be forgetting about a painful exercise experience in the past.

Counter conditioning is changing or modifying stimuli that once triggered a response opposite of the desired change such as not sitting at the table to have a cup of coffee because it stimulates a desire to smoke; avoiding the negative stimuli is called stimulus control. Creating new or different stimuli to elicit the desired change is called reinforcement management. This might include placing workout clothes in a desk drawer to remind someone to exercise. Changing the individual's surroundings to elicit a desired change, such as removing ash trays, is called environmental reevaluation.

The process of re-framing personal reactions to an event is called self-reevaluation. Rather than thinking of exercise as an interruption, view it as time to take care of personal needs. Eliciting the help of others whether it is family, friends, or a professional is establishing helping relationships.

More change processes are used in the contemplation, preparation, and action stages than in the maintenance stage. Movement through the stages is not uniform, and individuals may not progress through all of the stages. Others may actually relapse into earlier stages.

This model is the first to actually look at implementation of a behavior. It goes beyond the intention or contemplation stage, but it does not consider emotional factors such as self-efficacy or barriers to action.

Personal Meaning Fitness Education Model. The Personal Meaning Fitness Education Model (Rehor, 1991) is based on the other theories presented. This is the only model complete in its examination of fitness and exercise as a learning task in terms of adherence. In this model, there are three predisposing factors necessary for change: self-efficacy, the social norm, and individual beliefs.

Social norms refer to the fact that the majority of the population does not exercise (the social norm); thus there may be limited exposure to modeling of exercise behaviors to positively influence self-efficacy as supported by Bandura's Social Learning Theory. Individuals must also believe the program is important and value the worth of the program for intentions to be raised. These internal beliefs help raise intention to exercise in spite of the social norm.

The third precipitating factor is self-efficacy. Self-efficacy is Bandura's way of describing an individual's belief in self to accomplish a task. Another component of self-efficacy is knowing how to plan, implement, and continue an exercise program. Even if individuals have the desire to exercise and believe they will be successful, they still need to know what to do to be successful. This concept is supported by the work of Adams and Brynteson (1995). They found that college alumni who were required to take a conceptual-based physical education course for their graduation requirement were more likely to view exercise as

positive and more likely to actually exercise than those alumni who took activity-based physical education classes for their graduation requirement. A conceptual-based class examines the theoretical basis for fitness, teaches the proper implementation of a fitness program, and evaluates progress of the program throughout the course. An activity-based class simply teaches the basic skills and rules of a specific sport and then provides time for participation. Its not just the "want to" but the "know how" that makes exercise adherence a success. This, then, is self-efficacy.

If intentions have been raised through beliefs, comparison to the social norm, and increased self-efficacy then a three-step process is initiated: attempting to exercise, adoption of exercise, and adherence to exercise. Two other factors are also important for the adoption of and adherence to exercise; these are attitude and habit. For exercise to continue, the individual must have and maintain a positive attitude about the exercise. The exercise experience, including the instructor and other class participants (if applicable), and body perceptions will give either positive or negative impressions to influence attitude. Self-efficacy, influenced by real or perceived barriers and social norms, will greatly influence attitude. Barriers to exercise may be real in the form of lack of accurate information on how to begin a program or perceived

in the form of "lack of time." Value of the program (perceived or monetary) will also influence attitude.

The second additional factor needed for exercise to be adhered to is that it must become a habit based on this model. It is important to remove real or perceived barriers and find other positive facilitating factors that will allow the individual to exercise long enough for it to become a habit (Rehor, 1991). Formation of a habit at a very basic level is a type of learning.

The Personal Meaning Fitness Education Model takes into account the need for external reinforcement initially to provide the positive environment necessary to maintain motivation and intention. This goes beyond other theories in the recognition of external factors as also being important for exercise adherence and in not just relying on intrinsic motivations.

This model actually takes the best of the previous theories and expands them to make more sense. Any lifestyle change first requires intention. To raise intention, it is necessary to make individuals want to do something, convince them they can do something, and then show them how to do it. Through education, intentions are raised by improved self-efficacy and changed beliefs. Well taught classes provide modeling to increase self-efficacy as well as provide a positive, supportive atmosphere. By learning about exercise and giving that learning meaning, individuals are encouraged

to return. Classes are provided on a regular basis to facilitate the formation of exercise as a permanent lifestyle change.

Physiology of Fitness

Research has led the medical profession to realize the importance of exercise on the health of the body. Exercise causes several physiological changes to the various systems of the body with the cumulative effect of increased efficiency in the utilization of fuels for the performance of the various body functions (Pate et al., 1995; Powers & Howley, 1997). An individual who maintains a high level of physical fitness is conditioning five different components. The four components of cardiovascular fitness, strength, flexibility, and body composition are sometimes referred to as the health-related fitness components, and anaerobic fitness is an athletic performance component (Sharkey, 1990).

Cardiovascular Fitness

The first component is cardiovascular condition. This is the body's ability to transport oxygen from the lungs to the working muscles (Powers & Howley, 1997). Cardiovascular condition is considered the base for all other components of fitness (American College of Sports Medicine [ACSM], 1990). Cardiovascular fitness is achieved through aerobic exercise.

These exercises are sub-maximal in intensity, are rhythmic in nature, involve the large muscles of the body, and last longer than 10 minutes in duration.

The major changes caused by aerobic training are the improvement in the strength of the heart and the increased amount of blood it is able to pump per beat. Long-term aerobic exercise causes the heart muscle to adapt and increase in efficiency (ACSM, 1990; Powers & Howley, 1997; USDHHS, 1990). Increased muscle tone in the legs and the rest of the body helps push more blood back to the heart so it fills fuller after each beat (Powers & Howley, 1997, p. 234). The combination of filling fuller and ejecting more blood with each beat allows the heart rate to decrease without compromising the volume of blood moved each minute (p. 234). This decreased heart rate is one of the most obvious signs of a well cardiovascularly conditioned individual. If one is a fatalist and thinks that after a predetermined number of beats the heart quits, decreasing the resting heart rate will prolong the time until that last beat is reached.

In conjunction with the improvements of the heart muscle, there are increases in lung capacity which allow for additional oxygen to be exchanged into the blood (Powers & Howley, 1997). Also, the muscle tone of the arteries improves, which over time will decrease blood pressure. Blood pressure is a measure of the resistance of the

arteries to the flow of blood (Powers & Howley, 1997; Sharkey, 1990).

Aerobic activities done repetitively over a long period of time, at least eight weeks, cause the muscles to increase the number of mitochondria in cells (Powers & Howley, 1997). Mitochondria are the "power-house" of the cell where metabolism and energy production occur. The increased number of mitochondria are directly related to the increase in capillary beds that supply the muscles with an increased volume of oxygen. This increase in oxygen allows the mitochondria to produce energy for the cell through the aerobic breakdown of carbohydrates and fats. Because there are more mitochondria to "pick up" oxygen and there are more capillaries to supply it, the heart and lungs do not need to work as hard to deliver the same volume of oxygen to the cells. This contributes to a decreased resting respiratory rate (Powers & Howley, 1997).

The additional mitochondria increase the ability of the muscles to "burn" fats at an increased rate. This helps the body keep its levels of blood lipids within a healthy range and slows the build up of fat within the artery walls (ACSM, 1990; Pate et al., 1995; USDHHS, 1990). If the converse happens and fat deposits on the artery walls, a condition known as atherosclerosis, the decreased diameter of the vessels contributes to an increase in blood pressure and leads to a condition called hypertension (ACSM, 1990;

USDHHS, 1990). Hypertension is the main culprit in several debilitating conditions, of which the most notable are stroke and kidney failure (ACSM, 1990; Powers & Howley, 1997; USDHHS, 1990). Atherosclerosis is the leading cause of heart attack and the second leading cause of stroke (ACSM, 1990; Powers & Howley, 1997; USDHHS, 1990). The narrowing of the arteries progresses until an artery is completely occluded and the tissue supplied by that artery dies due to lack of oxygen. If this happens in the heart, it causes a heart attack; if it happens in the brain, it results in a stroke.

People who are in good cardiovascular condition store extra fluid in the blood to be used for sweat to keep the body cool during exercise (Powers & Howley, 1997). This additional fluid "thins" the blood and lowers the hematocrit. The measurement of blood cells to blood liquid is called a hematocrit (p. 163). This can be compared to the viscosity of oil in a car's engine; the thicker the oil, the higher the viscosity. With blood, the less fluid to solids ratio creates thicker blood or a higher hematocrit. The thicker the blood, the harder the heart must work to pump the blood through the blood vessels; this is analogous to the difference between pumping water and honey. If a person has a lower hematocrit, the blood is thinner and is easier to pump through the system (p. 163).

A second influence on the blood from exercise is the decreased "stickiness" of the platelets (ACSM, 1990).

Platelets are the blood cells responsible for clotting when there is an injury. In sedentary individuals, the platelets become "stickier" while in those individuals who exercise the platelets become "slipperier." This decreases the risk of abnormal clots forming in the blood stream that could lodge in an artery and impede blood flow and thus result in a stroke or heart attack (ACSM, 1990; Powers & Howley, 1997; Pate et al., 1995).

To review, regular aerobic exercise decreases resting heart rate, resting blood pressure, and resting respiratory rate; decreases blood lipids; and reduces blood viscosity. The overall result of aerobic fitness is a decreased risk for the development of cardiovascular disease including heart attack and stroke.

Other Fitness Components

Strength. Strength is the ability of a muscle to contract and generate force (Powers & Howley, 1997). The repetitive lifting or moving of a weight against gravity will, over time, cause muscle tissue to enlarge to accommodate the increased load (Powers & Howley, 1997; Sharkey, 1990). There are two separate components to strength development. The first is absolute strength--the ability to lift a large amount of weight one or two times

(Powers & Howley, 1997; Sharkey, 1990). The maintenance of overall body strength is important for the prevention of injury. Absolute strength gives the body the ability to lift large amounts of weight without injuring muscle tissue, especially in the back (Sharkey, 1990). Further, strength training has shown to be an effective way to maintain bone density (ACSM, 1990; USDHHS, 1990). Loss of bone density results in a condition called osteoporosis which can lead to bone fractures (ACSM, 1990; Sharkey, 1990; USDHHS, 1990). The second strength component is endurance--the ability to lift a much lighter weight several times (Powers & Howley, 1997; Sharkey, 1990). The endurance component is important for an individual be able to sustain an activity long enough to reach an aerobic health benefit (Sharkey, 1990). For example, if someone cannot ride a bike long enough to get an aerobic workout due to fatigue of the legs, cardiovascular health has not been improved.

Both strength components are important for successful living as well. The ability to lift a large weight one time might include the ability to lift a child or to move oneself out of a chair. The ability to repetitively lift a lighter weight includes things such as carrying a jug of milk or bag of groceries up a flight of stairs or holding one's head upright throughout the course of the day. Many tasks of daily living help maintain endurance but do little to maintain absolute strength (Powers & Howley, 1997).

Flexibility. The third component of fitness is flexibility. This is the body's ability to move its joints through a normal range of motion. To a certain degree, flexibility is determined by heredity. Some people are more flexible than others, but for the majority of people, flexibility is simply something that is ignored and thus lost (Brooks, Fahey, & White, 1996). Flexibility is necessary to decrease the risk of injury while doing activities such as strength training or recreational activities such as tennis. Joints unable to move through a full range of motion can be forced beyond their limits resulting in tissue damage (Sharkey, 1990). In addition, flexibility is necessary for good back health as well as maintaining independence through the ability to do such things as lift a leg over the side of the tub to bathe or to reach objects overhead.

Body Composition. The fourth component of fitness is body composition. Body composition is the ratio of body fat to lean tissue. Lean tissue includes skin, muscle, blood, and bone. An individual's body fat should be maintained at a level that is "comfortable" as determined by heredity, but which is also healthy as determined by the medical community. A good range for body fat is 15-20% of total body weight for men, and 20-25% of total body weight for women (ACSM, 1990; USDHHS, 1990). Men tend to have less body fat

than women. This is due to women needing additional body fat reserves for breast tissue, hormonal function, and the maintenance of a regular menstrual cycle (Powers & Howley, 1997).

An increase in body fat over ideal ranges contributes to a host of medical problems: (a) damage to weight bearing surfaces of joints which may lead to arthritis, (b) high blood pressure due to increased blood vessel length to supply the additional fat tissue and to fatty deposits on artery walls, (c) respiratory difficulties due to compression of the chest muscles by the excess fat and the accumulation of fluid in the lungs due to poor blood circulation, and (d) the development of Type II diabetes (ACSM, 1990; Pate et al., 1995; USDHHS, 1990).

Unfortunately, an increase in body fat is usually due to a decrease in physical activity. This becomes a vicious downward spiral of additional fat deposits with decreased activity (Sharkey, 1990). The reduction in activity also impacts all of the other components of health, especially the cardiovascular component (ACSM, 1990; Pate et al., 1995; Sharkey, 1990). Intake of excess calories especially from fat also contributes to high body fat deposits, but this is not nearly to the extent that lack of exercise does (Pate et al., 1995; Powers & Howley, 1997).

Those individuals who maintain a high level of physical fitness have higher capacities in all components of fitness

and usually have a lower percentage of body fat (ACSM, 1990; Powers & Howley, 1997; USDHHS, 1990). Even those individuals with a higher than ideal body fat who are physically active generally notice the beneficial results to blood chemistry values and blood pressure readings that regular physical activity causes (ACSM, 1990; Powers & Howley, 1997; USDHHS, 1990). Also demonstrated repeatedly, the only effective way to lose body fat and maintain that loss over an extended period of time is to maintain a lifestyle that includes physical activity (ACSM, 1990; Pate et al., 1995; Powers & Howley, 1997; USDHHS, 1990).

Anaerobic Condition. A final component to fitness, but one not usually associated with health, is anaerobic condition. Anaerobic condition is the ability of the muscles to work at a level higher than the body's ability to provide adequate oxygen supplies; thus, energy is provided through the anaerobic (without oxygen) breakdown of glucose (Powers & Howley, 1997; Sharkey, 1990). While aerobic activities last for several minutes and are done at a sub-maximal rate, anaerobic activities are usually very short in duration (less than two minutes) and are at a much higher intensity (Powers & Howley, 1997; Sharkey, 1990). Tasks of daily living do little to train this important component of fitness necessary for things like climbing a flight of stairs or moving out of the way of oncoming traffic. Again,

this fitness component does not affect health, but can limit some daily activities.

CHAPTER 3

METHODOLOGY

Design

This research utilized a qualitative case study design. "A case study is an examination of a specific phenomenon such as a program, an event, a person, a process, an institution, or a social group" (Merriam, 1988, p. 9). "A case might also be selected because it is itself intrinsically interesting, and one would study it to achieve as full an understanding of the phenomenon as possible" (p. 10). There is no particular method of data collection with a qualitative case study. Surveys, questionnaires, interviews, observations, and even testing may all be used in a case study. The methods are chosen to examine a phenomenon, to gain insights, discovery and interpretation, rather than to test a hypothesis (p. 10). "A case study is a design particularly suited to situations where it is impossible to separate the phenomenon's variables from their context" (p. 10).

A qualitative case study contains four basic elements (Merriam, 1988, Chapter 1). The first is that the study is particularistic. This "means the case studies focus on a

particular situation, event, program, or phenomenon"

(p. 11). The group defined by the parameters of the research become a "bounded system" (p. 9). It is a holistic examination of a particular situation.

The second element is that the study is descriptive. The end result is a "rich, thick description of the phenomenon under study" (p. 11). Thick description means "the complete, literal description of the incident or entity being investigated" (p. 11). Descriptions include quotes, observations of the researcher, examples, and analysis of the social and cultural context in which this phenomenon occurs.

The third element of a qualitative case study is that it is heuristic. This means the study will "illuminate the reader's understanding of the phenomenon under study. They can bring about the discovery of new meaning, extend the reader's experience, or confirm what is known" (p. 13). The reader should be able to draw insight into why a particular phenomenon occurs after reading a qualitative case study.

The fourth element is that of induction. "Generalizations, concepts, or hypotheses emerge from an examination of data--data grounded in the context itself" (p. 13). The researcher looks for patterns within the data that may lead to new theory, hypothesis, or understanding of a phenomenon.

These four elements create knowledge in a different way than traditional qualitative research. Stake has identified four important ways that case study knowledge is different from qualitative research information:

- More concrete--case study knowledge resonates with our own experience because it is more vivid, concrete, and sensory than abstract.
- More contextual--our experiences are rooted in context, as is knowledge in case studies.
- More developed by reader interpretations--readers bring to a case study their own experience and understanding, which lead to generalizations when new data for the case are added to the old data.
- Based more on reference populations determined by the reader--in generalizing as described above, readers have some population in mind.
(Merriam, 1988, p. 15)

There are three general types of qualitative case studies. A descriptive case study is purely atheoretical. It is simply an attempt to describe what is observed. An interpretive case study goes beyond simple description and attempts to develop or support theoretical assumptions (p. 28). Sometimes called analytical case studies, these studies are more complex and based on more theory than a simple descriptive study. An evaluative case study takes the interpretive case study one step further and adds judgments of the researcher into the mix. "This type of case study weighs information to produce judgment. Judging is the final and ultimate act of evaluation" (Guba & Lincoln, 1981, p. 375).

Participants

In this case study, 9 individuals enrolled in an aqua exercise program for senior citizens were interviewed. All participate in the classes on a regular basis and are 60 years of age or older. If weather or travel interfere with class, they choose other exercise options available to them, mostly walking. These individuals are engaged in a variety of activities within the community, and exercise is only one of these activities.

This group of exercisers was chosen because of their vitality and their age and because they are so regular in their fitness activities. The individuals in this study exemplify the meaning of successful aging. Even though they have had medical setbacks, declines due to the aging process, and cannot continue the activities they once did, they are still vital, excited individuals.

Eight women and one man participated in this study. There are six other regular participants in the class: five women and one man. Three were unavailable for the study and the others declined to participate. The ratio of women to men in the study is consistent with the elderly population in that there are more women than men in this age group (Fowles, 1994).

The Setting

This study was conducted in Havre, Montana. This Hi-Line community has a population of about 12,000 people. The majority of the population is economically associated in some way with agriculture, the Burlington Northern-Santa Fe Railroad, Northern Montana Hospital, or Montana State University--Northern. This close-knit community endures harsh winters, dry summers, and geographic isolation. The closest metropolitan communities are Great Falls, 110 miles to the South, or Medicine Hat, Alberta, Canada, 150 miles to the North.

The aqua exercise class the study participants were enrolled in is sponsored by the university's Employee Wellness Program. This voluntary program is funded through the insurance plan of the university and is designed to decrease claims and ultimately expenses against the policy through reducing risks for disease. Cardiovascular disease is the primary target. Providing exercise classes is an important component in reducing risks to contain costs.

The class is offered to retirees of the university at no out-of-pocket expense as they have already paid through their insurance premiums. Others pay a fee comparable to similar classes offered throughout the community. Other community classes for senior citizens are offered by the hospital, the city recreation department, and the senior

citizen's center. The only other aqua exercise class available is offered through the city pool.

Procedures

For this case study, data were gathered by interviewing the participants. For all interviews, the same basic types of questions were asked about how the individual feels about exercise, exercise habits over a lifetime, how the individual feels he/she learns, and how the individual feels exercise and learning are related.

The participants in this study were asked questions about their preferred modality of learning. To determine if they were visual learners, they were asked if they learn best by watching someone else perform a task first and then copying the task. An auditory preference was confirmed if they agreed they learned best by having someone read the directions to them rather than reading the directions to themselves. To determine whether they had a psychomotor preference, they were asked if they simply jumped in and began a project or if they read directions or sought input of some kind first.

Another framework that is useful for examining learning styles is based on the work of Kolb (1981). In his Experiential Learning Model (Kolb, 1974, pp. 27-28), Kolb (1985) conceptualizes learning as "the process whereby knowledge is created through the transformation of

experience" (p. 41). In this model, learning starts with a concrete experience which is observed and reflected upon. This process leads to the formation of generalizations. Testing these generalizations in new situations leads to new concrete experiences. In this cyclic learning process, different stages in the cycle require different cognitive skills.

Kolb (1981) grouped learners into four different categories by placing different "learning modes" on two perpendicular axes. Each of the axes has opposing pairs of the cognitive tasks in the Experiential Learning Model. These form two dimensions along which people vary in their learning (see Figure 1).

The vertical dimension describes the way people perceive information; it varies from those who can gain new insights through abstract thinking to those who prefer concrete experiences. The horizontal dimension describes the way people process information once it is perceived; that is, how they internalize new information and make it part of their overall knowledge base. This dimension varies from those who can process information by observing and reflecting on it to those for whom actively working with new information is the best way to assimilate it. (Ivey, 1992, p. 42)

In this organizational scheme, the first axis places Concrete Experience opposite of Abstract Conceptualization. Concrete Experience "emphasizes personal involvement with people in everyday situations. . . . You would tend to rely more on . . . feelings than on a systematic approach to problems" (Kolb, 1985, p. 5). Opposite of a Concrete

Experience mode is the Abstract Conceptualization mode. Here "learning involves using logic and ideas, rather than feelings, to understand problems. . . . You would rely on systematic planning and develop theories and ideas to solve problems" (p. 5).

The other axis, which is perpendicular to the first, places Active Experimentation opposite Reflective Observation. Active Experimentation involves "experimenting with influencing or changing situations. . . . [It involves] a practical approach and be[ing] concerned with what really works" (p. 5). Someone opposite of Active Experimentation is operating from the Reflective Observation mode. "You would rely on patience, objectivity, and careful judgment but would not necessarily take any action" (p. 5).

The two axes form four quadrants. Each of these can be associated with a distinct learning style. The combination of Abstract Conceptualization with Active Experimentation forms a Converger.

People with this learning style are best at finding practical uses for ideas and theories. . . . [They] have the ability to solve problems and make decisions based on finding solutions to questions or problems . . . [and] would rather deal with technical tasks and problems than with social and interpersonal issues. (p. 7)

A Diverger is a learning style formed by the combination of Concrete Experience and Reflective Observation and is opposite the Converger. "People with this

learning style are best at viewing concrete situations from many different points of view. . . . [They] observe rather than take action" (p. 7).

Combining Abstract Conceptualization with Reflective Observation creates the Assimilator. "People with this learning style are best at understanding a wide range of information and putting it into concise, logical form. . . . [They] are less focused on people and more interested in abstract ideas and concepts" (p. 7).

The last type of learning style is the Accommodator. It is opposite of the Assimilator. Accommodators are "people with . . . the ability to learn primarily from 'hands-on' experience. . . . [You] enjoy carrying out plans and involving yourself in new and challenging experiences . . . to act on 'gut' feelings rather than logical analysis" (p. 7).

By analyzing responses, individuals can be placed into one of the four quadrants of this framework. Asking participants about whether they like working in groups or alone would indicate whether they gravitated toward the Concrete Experience end of the axis rather than the Abstract Conceptualization end. Participants who indicate a need to plan learning activities would be placed on the Reflective Observation end of the axis as opposed to those who just jump in and do things, who are on the Active Experimentation end of the axis.

Both frameworks provide valid ways of identifying different aspects of learning styles (Marshall, 1986). For example, those individuals who respond by saying that they have always been busy, enjoy "puttering," and like to do new things could be categorized as being kinesthetic learners based on Dunn, Dunn, and Price and Concrete Experience learners by Kolb. Those who like to read and do better if they can see a task demonstrated can be identified as visual learners as well as utilizing Reflective Observation.

Responses also give clues as to what types of learning strategies they use. Learning strategies are the techniques or skills employed by individuals to learn (Conti & Fellenz, 1991). Conti and Fellenz have identified 5 areas of learning strategies. Those participants who easily identified their personal learning style would score high in Metacognition: knowing about and directing one's own thinking and learning process. How they respond to questions about their persistence in exercise will reveal clues about Metamotivation: awareness of and control over factors that energize and direct learning. The way they describe events in their lives may give clues to the types of Memory strategies they use. The way they describe the processes they use to learn a new task will also give insights into their Critical Thinking processes and what types of Resources they use as well.

Thus, the concept of learning styles was used as a basis for organizing the interview questions and for analyzing the interview data. From these interviews, from the classification of participants into learning style groups, and from the identification of individual learning strategies, the learning patterns of each participant could be described. Also, information about how they felt about exercise and learning was gleaned. Together, this information provided insights into why these individuals continue to exercise while the social norm is opposite of their behavior.

Interview Questions

To understand how each person learns and to gain information about their fitness habits, participants were asked the following types of questions in a conversational format:

1. Describe your current exercise habits.
2. Describe your exercise habits when you were a child/adolescent/young adult.
3. What things have caused you to change your exercise habits?
4. Describe other social or learning activities you have started lately.
5. How did you go about learning how to do this particular activity?

6. What is the relationship of exercise to the rest of your lifestyle?
7. What do you like about exercising?
8. What do you not like about excising?

Academic language was not used in the interviews because most individuals were not familiar with learning style terminology. Examples of how each individual went about learning something new were elicited. Also, most people do not consciously think about the best way that they learn. Therefore, the responses were used as clues to indicate which learning style category each person could be placed. If a particular pattern became evident early in the interview, questions became more focused in that particular area. Others were more difficult to determine initially, and so questions were kept at a broader level to get as much variety of responses as possible to determine learning styles. Through this probing process about activities, exercise, and learning, learning patterns of all participants were identified.

Methods of Data Recording

The method of data recording was via videotaping; each participant agreed to be videotaped. After some introductory questioning related to demographic items such as age, birthplace, and marital status, most participants became very relaxed and unaware of the camera. The videotaping not

only captured the words but the facial expressions and tonality used by the participants. The responses many times were passionate and excited.

The videos were then reviewed to confirm interview conclusions and to uncover additional information about each individual. Notes of learning style preferences and learning patterns were taken during the initial interview and were further developed and expanded by viewing the videotape. Each interview lasted approximately one hour. Follow-up telephone calls were made to approximately 30% of the participants to confirm any questions that arose from the data review process. Notes from those conversations were included with compilation notes made for each interview.

After all of the interviews were completed, the videos were shown to a graduate research class at Montana State University--Northern. The class was given information about qualitative research methods and was then asked to watch the interviews to formulate their own impressions of the learning patterns of these participants. The process of having findings verified by another independent source is one means of triangulation (Merriam, 1988, p. 169). This procedure helps confirm validity of the findings of a qualitative research method (p. 169). This process is similar to the concept of peer consultation in which other experts are involved in analyzing the research data in order to confirm the initial research finding and to provide

additional insights in the interpretation of the data (Guba & Lincoln, 1981).

CHAPTER 4

RESEARCH FINDINGS

Data were gathered through interviews with each of the study participants. Open-ended questions were asked to help determine the learning patterns of each individual. After all of the interviews were complete, five individuals viewed videotapes of the interviews and gave feedback concerning the patterns they observed about the individuals in general and learning in particular. The feedback from those individuals was consistent with the findings of the researcher. The major themes that emerged from the data were related to learning styles and strategies, lifestyles, self-determined learners and lifelong learning, zest for life, learning background, and childhood. In addition, a profile for each participant was constructed.

Profiles

From the interviews, an overall theme emerged that these were socially, physically, and mentally engaged individuals. Physical exercise was only a small part of their days. They were vital, excited, interested, and interesting people. While all of the participants are fit and healthy individuals, none would be considered an

athlete. All of the participants agreed to the use of their names for the purposes of this study.

Cindy - 61

Cindy was born in Saskatchewan, Canada. Her parents were farmers but had both earned degrees in physical education from Iowa State University. The home in which she grew up had no electricity or running water until she was in high school. She described a very active childhood playing many different sports as well as helping her parents on the farm. After attending the University of Montana and earning a degree in home economics and physical education, she taught in several small Montana schools. From there she moved to Helena to work for the Office of Public Instruction and then on to Northern Montana College as assistant dean of students. She retired from the dean's position, but has continued to work. She has been employed by an insurance company, then by the U.S. Census Bureau, and most recently for a local photography studio. She never married, but spoke fondly of a long-time companion with whom she spent many hours hiking, fishing, hunting, and going dancing.

Cindy loves to travel. She has taken it upon herself to plan trips for another couple and herself to various points of interest--most recently to Branson, Missouri. She wants to find someone to travel with who is younger and more inclined to take an adventure.

I'm blessed having people like that that enjoy doing stuff like that. I have a niece that I think will be pretty good at it too. I decided I was going to do a week-long horse packing trip by myself along the Great China Wall [Bob Marshall Wilderness] because I couldn't find anyone to do it. So, I said "I'm just going to do it," and Cathy said, "I'd like to do it!"

Cindy has always been active. First, she was involved with sports. Then she participated with her students in physical education classes. She has always been in individual or organized fitness classes. She also owns and cares for several horses and has a dog she walks every day.

Lynn - 64

Lynn is a retired college professor. She taught physical education and health classes for Northern Montana College. Prior to that, she was a physical education and home economics teacher in various small communities in Montana. Lynn was born in a small northeastern community of Montana. Her mother had also been a teacher. She was her father's hired hand while growing up. She was also very involved with sports at home and at school; "Dad would hit us pop flies to catch" she fondly remembers. She is married and has two grown children. Lynn is responsible for the care of both her husband who has had a stroke and her elderly mother. They live in Montana during the summer but travel to warmer climates during the harsh winter months.

Lynn participated with her physical education classes both in the elementary schools and the college. She was

instrumental in starting yoga and walking classes for the employees of the college during the noon hour. She loves to travel and just recently finished compiling a 167-page, four-generation genealogy of her husband's family. To compile the genealogy, she learned to use a computer, mostly through the help of her son who installed the programs she needed and taught her how to use them. She is a regular participant in the aqua exercise class during the spring, summer, and fall, and walks during the winter in Arizona.

Lynn's choice to teach physical education reflects her lifelong commitment to involvement in physical education.

I always thought it was a good thing to do. . . . I never liked the competition. I always felt you should enjoy sports for what it is rather than having to compete. . . . That was what I wanted to get out of physical education; I wanted people to learn to be able to enjoy it.

Anita - 71

Anita was a large child. As a senior in high school, she was 200 pounds and about 5'6". Yet, she was still very involved in sports. She walked everywhere and still enjoys walking. Besides aqua exercise, Anita enjoys line dancing and bowling where she maintains a 153 average. She and her husband own a cabin in the mountains and try to spend time there each summer. They also share a common interest in ham radio operation and belong to a group of operators from all over the world. Anita enjoys reading, knitting, crocheting, crafting, and oil painting. As a child, Anita always thought

she would be a nurse. During World War II, she was accepted into nurses training in Bozeman. After attending the 3-month training course, she was placed into her clinical experience in a hospital. She quickly discovered she "hated" nursing. This discovery was very disappointing to her. She quit the program and went to work as a clerk/stenographer. After the war, she worked sporadically while raising her children. When her husband was injured and unsure about his continued employment, he insisted she return to school. She obtained her degree in elementary education and later received a master's degree.

Anita loved teaching science. She was also the physical education teacher and participated with the students. She strongly believes that she and her students "learn by doing." "I'm not satisfied unless I can try something [to] see if it's really going to work or not." She disliked moving from teaching just science to a self-contained classroom. She felt students were "cheated" out of some of the subjects, especially science, in that type of an environment.

Anita loves to travel and went on several trips with a former science teacher from the local college to do research. She traveled to California, Hawaii, Africa, China, and Japan. She does limit her activities now because her husband is 10 years older and not as active and likes to have her at home.

Sylvia - 73

Sylvia grew up on the Hi-Line in Montana, attended the local college, and taught English and physical education at the local elementary school. She married and spent her "spare" time helping her husband on their farm and ranch. She has four children and several grandchildren for whom she loves to cook and bake. Her baking and canning are regular ribbon winners at the local fair.

While in college, she worked for the dean of education. Although she did not particularly care for her employer who early on was "too harsh," she grew to respect her:

She was wonderful to work for. She was the head of teaching, and I was taking teaching. If she wanted to have a perfect job done, she made sure I got it; that I put it out for her.

As a teacher, part of her duties were to observe other teachers to insure they were teaching within the curriculum guidelines established for that subject area. She also participated with her students in physical education classes.

Sylvia suffered a stroke one year ago and has been working hard toward her recovery. She attends physical therapy at the hospital as well as the aqua exercise class. She has had to relearn to walk, talk, and do other tasks of daily living. She and her doctor attribute her remarkable recovery to her physical condition prior to the stroke as well as her tremendous motivation to get better.

Toby - 74

Toby was born in north central Montana and lived in town. She was fortunate to have the luxuries of electricity, running water, and gas during a time when many did not have such things. As a child, she walked everywhere and enjoyed playing a variety of childhood games. She attended college taking a variety of general classes, but she did not complete a degree.

She worked at Boeing during World War II and then returned home to raise a family with her husband. They owned the local photography studio, and Toby helped him from home by doing the hand-coloring of photos before the advent of color photography. She enjoyed the ability to work from home while the children were in school or sleeping. She attended classes to learn the art of coloring, and she remembered that her friends were envious of her opportunity to do more than "bridge and coffee parties."

Later, she was a department secretary at the college. There she was active in the noon walking and yoga classes. After retiring, she and her husband did a lot of traveling. Her favorite trip was to Asia.

The culture was so different: the architecture, the food--everything was so different. We enjoyed Europe, the cathedrals and architecture and all, but Asia was just so enchanting. I thought it was the trip of a lifetime. . . . Asia was, by far, my very, very favorite.

Currently, Toby is recovering from back surgery and is not as active as she would like. She referred to herself as being "sort of a dud" lately. Other than short walks, she is pretty well limited to reading as her only diversion. She does not do as much crafting as she used to, "after all, you can only give your friends so much of that stuff!" She is involved with several volunteer projects within the community. Toby said she does not want a computer as she is too busy to sit at one. However, she has used computers and enjoyed the experience.

She is also very busy with the care of her husband who has advanced Parkinson's disease. After his diagnosis, they organized and facilitated a support group for other Parkinson's patients in the community for about five years. After interest waned and his condition deteriorated, they passed the group on to someone else.

When asked why she thinks she has been so successful in adapting to the many changes over her lifetime, Toby replied:

You do what you have to do, [you] just go on. You take the changes as they come. The one thing you can count on is change. There's no getting away from it. You have to change or become stagnant.

Marietta - 75

Marietta grew up in southeastern Montana on a farm where it was so dry "I didn't know what water was as a kid." She was a very active child helping on the farm,

participating in sports and walking everywhere. After college, she became an elementary teacher first in a one-room school house and then for 28 years in the local system. She enjoyed teaching physical education classes and participating with the children. She would even teach the physical education classes for other teachers who did not enjoy doing so. She was also the "referee" during recess games. "It was easier to go out and referee [the games] than to settle the arguments." She especially enjoyed teaching social studies. She was told by her students, "You always made it sound so real."

Marietta has always enjoyed walking and participates in a mall walking program through the hospital when it is too cold to walk outside. She and her husband both do a lot of walking but not together. "He has bad feet. I can't gear down to his pace, and he can't gear up to mine. We go up there [the track] together, but walk at our own pace." She enjoys the aqua exercise class, but remembered having a great fear of water and having to really "talk herself into" attending the class at first. She has since taken lessons and overcome her fear of the water though she does not think she is a very good swimmer.

Since retirement, Marietta and her husband have been very active in many volunteer programs. They were recognized this past summer as the community volunteers of the year through the senior citizens' center and the Retired Senior

Volunteer Program. Currently, she helps out with the paperwork for the city court. She enjoys the variety of the work as well as feeling she is making a valuable contribution.

She and her husband do a lot of traveling in the United States and Canada. She also travels extensively with her sister on other trips because her husband will not travel overseas. She joked about taking trips to places she taught about to she if she "taught it right." She "studies" before she leaves on a trip to make sure she "doesn't miss anything." "Anybody says 'let's go!' I just say, 'How soon do I have to be ready!'"

Marietta suffered a stroke 5 years ago. She is "fighting back" from it and attributed much of her recovery to being so active prior to it. The fact that she had a stroke was surprising to her "because I was so active and didn't have a family history of stroke."

Marietta has a terrific sense of humor. She joked about tripping and falling recently and receiving a black eye. "My foot caught on a crack in the sidewalk and I fell. I didn't get me hands out fast enough, so I sure looked beat up." She even teased when describing their only child, a son: "He could have been two because he's six feet seven-and-a-half and wears a size 15 shoe!"

Emma Marie - 79

Emma Marie is a very petite lady who grew up in central Montana. She describes herself as being an overweight, "clumsy" child. Even so, she was active, playing tennis and walking. Later, she enjoyed yard work, but she admits to not exercising much beyond what she had to do for work.

After attending the local college, Emma Marie helped her husband with several different business ventures. She did the bookkeeping for the businesses. They had no children.

Emma Marie talked about having a photographic memory and always enjoying working with numbers and figures. She disliked working with computers at first. She was afraid she would "loose everything." She also did not like the fact that she did not have "everything at my fingertips" and physically on paper.

Though officially retired, she is very busy. Due to her background, she has served as secretary-treasurer for several church and local organizations. Gradually, she has been giving them up and is practicing saying "no" to requests to have her help again. She feels that her home has suffered because she is so busy.

I'd rather do anything else. When you work, you only have so many hours to get everything done, and you're much more efficient. When you're retired, oh well. Somebody asks you to do something and you'll do it [house work] another day.

Emma Marie is a history buff who enjoys reading historical novels and fiction. She also enjoys traveling and has been to Europe, Hawaii, Canada, and various parts of the United States. Her travels have been curtailed in recent years due to the death of her "traveling pal." Emma Marie would like to travel again as soon as she finds a new traveling partner. She enjoys crocheting and knitting and recently began taking piano lessons. Elderhostle classes are a favorite summer activity.

Several years ago, Emma Marie decided that there was no one to care for her, so she had to take care of herself. She joined a local weight-loss group and began taking the aqua exercise class even though she was initially afraid of the water. She requires a flotation belt to keep her head above water in the shallow end.

Molly - 83

Molly is a stoic, petite woman who grew up in Minnesota and North Dakota. While a child, she was active in school sport activities and played soccer in college. After World War II, she moved to Montana to teach home economics in various small communities. While teaching in several of the small schools in the state, at various times she was also asked to teach physical education, chemistry, and basic science.

She and her husband have three children. Since retirement, Molly has been an active volunteer in the community and is the "chief decorator" for the senior citizens' center. She and her husband have been regular participants in the aqua exercise classes and were regular exercisers prior to that.

While a home economics teacher, Molly preferred teaching the clothing portion but was assigned the cooking as well. She preferred sewing to knitting because knitting is "too slow." She also liked to teach the boys rather than the girls.

They [the boys] were really interested in foods and cooking. They didn't go by each little specific measurement; they experimented a little. They were more brave [than the girls].

Molly has taken several computer classes even though she does not own a computer. She enjoyed learning about them but feels the classes moved too quickly for beginners.

Joe - 84

Joe is a retired English professor who grew up in North Dakota. He and Molly are married. He played a variety of sports in school and played baseball in college. After serving in the army during World War II, he came to Montana to teach and coach in high schools across the state. After attending graduate school, he taught at Northern Montana College in the English department. He especially enjoyed

teaching classes in British literature and history of the English language.

Joe and Molly used to travel. They went to Europe, Hawaii, Russia, and several locations within the United States. They have not been traveling lately due to decreased opportunity for trips and advancing age.

Learning Styles and Strategies

Kolb's Learning Cycle and auditory, visual, and psychomotor learning modalities were the basic framework for examining the learning styles of the participants. Learning strategies were examined based on the concepts in SKILLS. The illustration of learning style through a series of open-ended questions was relatively straightforward for most of the participants. The types of questions used were drawn from the Kolb Learning-Style Inventory and included:

1. When learning a new task, how do you best do it? Do you read the directions, ask someone to demonstrate it, or just experiment with it?
2. What types of activities do you enjoy engaging in? Other than the exercise class, what other exercise methods do you engage in?
3. When learning how to use a computer, do you read the manual, have someone demonstrate how to do it, or just jump in and try it?

4. What types of activities did you participate in when you were younger? What subjects did you most enjoy in school? Why?
5. When preparing to travel, do you read about where you are going and plan your trip, or just see when you get there?

Each question was designed to reveal aspects of learning-style. For example, the question about learning something new was directed at Kolb's concept of Active Experimentation. The question about subjects enjoyed most in school was to provide insight into Kolb's concept of Reflective Observation. Questions about using the computer were asked because almost all participants mentioned learning to use a computer. How they approached this learning task gave insight into which of the learning concepts Kolb describes apply to each individual. Also, almost all participants talked of traveling. How they prepared for the trip displayed tendencies toward Reflective Observation or Active Experimentation.

The way they responded to questions as well as the answers they gave provided clues to which modality of learning (visual, auditory, or psychomotor) they prefer. Their responses also indicated the types of learning strategies they used.

Accommodators

Of the nine participants, five (Cindy, Lynn, Anita, Toby, and Sylvia) were determined to be Accommodators. This is the combination of Active Experimentation and Concrete Experience on Kolb's LSI. These participants are very active in all aspects of their lives. They talked with emotion and feeling. They used phrases such as "I feel like this, I enjoy this, I liked that, I was disappointed by that." They talked about jumping in and doing things and not sitting back and thinking about them first. "I pulled the machine out of the box, jumped on and started going." They preferred having someone show them how something should be done, rather than reading about how to do it. This was especially true about the use of a computer. "I had him show me how to do it, and then I'd do it and have him watch." "My daughter sits with me and helps me." All of these are traits associated with Kolb's definition of an Accommodator. With the exception of Lynn, they would all be psychomotor learners. Lynn tends to be a visual learner but definitely uses some psychomotor tendencies as well.

Other Styles

Two other participants were very similar to the Accommodators but were in the opposite areas of Divergers and Convergers. The first is Emma Marie. She is also very busy. She is an Active Experimenter, but she enjoys working

with numbers and claimed to have a "photographic" memory. She talked of analyzing problems and mistakes with book work in her mind and finding solutions while she slept. She also talked of distrusting a computer because the information was not "right there" in front of her. She is toward the middle of the Concrete Experience-Abstract Conceptualization scale. Her slight leaning toward the Abstract Conceptualization side placed her as a Converger. Emma Marie's photographic memory and reliance on having people show her how to use a computer was a strong indication of a visual learning mode.

Marietta also closely resembled the Accommodators but showed some Diverger tendencies. Divergers combine Reflective Observation with Concrete Experience. Marietta is very active, loves outdoor activities and traveling, again indicating the Concrete Experience mode. She also recalled enjoying math, but disliking science, indicating a tendency toward thinking and forming ideas rather than experimenting, which are traits of a Reflective Observer. Even so, she did say that to learn how to use a computer, "I would just have to experiment and use it to learn how to do it. I need to practice things more to remember them since my stroke."

Marietta was almost in the middle of the Active Experimentation-Reflective Observation scale with a slight leaning to the Reflective Observation side. She also is a psychomotor learner. This was demonstrated by her use of words like "fought back" and "experiment."

The other two participants were a couple. Joe is a retired English professor and Molly is a retired home economics teacher. He was an Assimilator while she was a Converger with some strong influences from her husband toward the Assimilator tendencies. Joe stated that he is not currently studying anything because he does not need to since he has retired. Nevertheless he reads Time, U.S. News & World Report, and The Atlantic Monthly "cover to cover." He also enjoys attending the weekly faculty luncheons at MSU--Northern to hear different faculty share information from their latest research or area of interest. Common terms for Joe were "I think" or "I see" rather than using feeling words. He was a strong visual learner.

Molly also referred to things in terms of "I think" but talked about being very busy and active. She likes doing new things. She enjoys sewing, but finds knitting "too slow." She has taken classes to learn how to use a computer. In doing so, she relied on the instructor and in-class activities to learn rather than on reading a manual. She, too, was a visual learner but did use some psychomotor modes as well.

Learning Strategies

Evidence of the use of all five types of learning strategies was displayed by the participants. As expected, some relied more heavily on some areas than others.

Following are a few examples to illustrate each area and their application as part of the participants' learning patterns.

The learning strategy area of Metacognition is knowing about and directing one's own thinking and learning process. The Metacognition strategy of planning was particularly evident. For example, Marietta talked about "studying" prior to leaving for a trip, and Cindy planned and organized trips for herself and others.

I had mentioned to Bob about going to Branson, and he thought that would be good. One day in the restaurant, the minister asked, "Where are you taking them this year, Cindy?" and I said, without thinking, "Branson." Then I had to make all of the arrangements to do it.

Lynn said, "I try to take a different route to Arizona every fall, but I've traveled more than most people, so they aren't much help in deciding which route to take."

All of the participants exhibit the Metacognition trait of Adjusting. Throughout their lives, they have adapted and adjusted their learning to accommodate the changes in technology as well as changes in themselves as they age. Emma Marie talked about her driving. "I don't go to the mall in the winter when it's icy because I don't like driving up that hill." Cindy switched from running to walking and using an exercise machine to accommodate her arthritic knees.

Metamotivation is the awareness of and control over factors that energize and direct (motivate) learning.

Especially of note is the strategy of Reward/Enjoyment. Lynn stated bluntly, "I don't do things I don't enjoy"; Anita took great pride in completing a quilt; and Molly "enjoys volunteering." Another strategy is confidence in believing that one can complete the learning task successfully. Cindy simply stated, "I love new challenges." They have every confidence they will have the ability to meet challenges and be successful. Sylvia did not even consider the possibility of not regaining full function and planned on resuming her former lifestyle.

Memory is the storage, retention, and retrieval of knowledge. The adaptation of this strategy is best demonstrated by Marietta. Since having a stroke, she is very aware that her memory has been affected and she pays particular attention on focusing to remember new information. "I do things like puzzles to keep me aware. Working at the court also helps, because I have to concentrate." Toby demonstrated a simple but effective memory retrieval trick: "Joe is a waiter at a hotel in San Francisco. . . What is the name of that resort here in Montana? [Interviewer answer: Fairmont] That's it! That's the name of the hotel!"

Critical Thinking is a reflective thinking process utilizing higher order thinking skills. Emma Marie talked of limiting her travel as she questions the value of the trips versus the cost:

We went on the fall foliage tour [in New England] and it was real disappointing. The people who went the next week probably didn't see anything. They had a real early fall and most of the leaves were already done. . . . You have to be real careful. The trips are getting so expensive.

Cindy realized that "through problems you learn a lot" which required reflection on the circumstances and outcomes from the problem and how to apply that to future situations.

The final learning strategy of Resource Management is the process of identification, evaluation, and use of resources relevant to the learning task. Toby and her husband joined a support group in Great Falls for those affected by Parkinson's disease after his diagnosis. The purpose of the group was to share information on treatment, support resources, and other issues related to living with the disease. Later, when they formed another support group in Havre, "I used the radio, the newspaper, and word of mouth to generate interest in the group." Lynn watched a TV program to gain information on which household items may be of antique or collector value. "It's so hard to know what's good and not. And it's hard to know what appraisers you can trust, and they're so expensive. That show really helped, and they have an address I may write to for more information."

Many of the participants talked about using others as a resource. One valued human resource was their children. Sylvia's daughter was a resource while she was learning how

to use a computer for her physical therapy. "My daughter helps me with the computer to get this arm to work." Another resource listed by many as being important in reaching their exercise goals was the instructor. Though not critical, having a knowledgeable and personable instructor made the class more enjoyable and valuable. "Ceil is just a wonderful instructor." "I really like Ceil, she's terrific."

Lifestyle

In addition to the themes of learning style and strategy, around which the interview questions were focused, several other themes emerged; the most important was that of lifestyle. All of the participants were aware of the importance of exercise to their overall health and well-being. This awareness has resulted not from learning in the traditional academic sense, but from becoming aware of how they felt when exercising compared to times when they did not exercise. While this awareness is more subtle, it is similar to the concept of critical reflection in which "adults will come to question many aspects of their professional, personal, and political lives" (Brookfield, 1986, pp. 10-11).

Cindy was particularly aware of the impact of exercise on her due to a time in her life when she did not exercise much:

Helena was one of my toughest times because I was on the road. In spring and fall I could go out walking, but in wintertime you'd go back to the hotel room and that was it . . . That was probably my poorest time as far as [activity] and I did, I put on some weight then. . . . It really affected my attitude toward the end; there wasn't that zest, that enjoyment of everything. . . . It was that lifestyle that didn't fit me.

Anita attributed her good health to having always been active: "The more you can do, the better off you are."

Sylvia and Marietta attributed their ability to recover from a stroke much to their prior exercise habits.

None of the participants viewed exercise or activity as something negative. As Lynn put it "[at my age] I don't do things I don't like to do." Cindy talked of the "high" she gets from exercising:

It was amazing when all of a sudden I felt that high from running. It just really intrigued me. The first half mile, boy I'd know it, and all of a sudden then everything would kick in and then it was just so easy. I true loved running--just loved it. . . . I feel the same with this [exercise machine]. I get the same feeling.

The aqua exercise class is only part of these participants' day. Many walk either with the hospital walking group or on their own. Molly and Joe participate in both the city and university aqua exercise classes depending upon which one fits into their schedule. "We prefer the university class instructor, but we go to the other class because it fits our schedule better." The instructor is not the motivating factor for them to exercise. Lynn talked of a neighbor in Arizona that she walks with. "Having her helps

get me motivated to walk; I enjoy her company. Sometime it just doesn't fit into my schedule, though. And I sometimes like to walk alone, just to get away from everyone."

Exercise is part of the daily routine of these participants; they have incorporated it into their lifestyle. Maintaining their exercise is as much a priority to them as any other part of their day. Emma Marie came right to the point: "I really have a priority for that [exercise class]. I don't have time [for senior citizen's group activities]. They play cards and they're never done by three o'clock and I need to be at the pool."

Self-Determined Learners and Lifelong Learning

Although they are retired and not working full time, each participant talked of learning something new within the last few months. Anita learned to quilt:

You didn't know what you were doing until you got to the very end. . . . It was very challenging to me because, not making a quilt before, I made all these little blocks and sewed them all together. It was challenging, but I got it done.

Emma Marie spoke with pride on learning how to use a computer. "I'm glad I did it. Learning how to use the computer at my age." Joe and Molly attend the weekly faculty luncheons at the university as they find the topics of discussion "interesting."

Five years ago the pool re-opened after a long closure due to remodeling. Upon their return, the first thing

several of the participants did was to contact the university administration to have additional handicapped parking established in the parking lot near the pool. They took it upon themselves to get things done rather than wait for the program director or instructor to do it.

Emma Marie has attended several workshops at the university and the hospital on nutrition and exercise. "After my cholesterol was so high, I went to see Lisa [nutritionist] to get on a diet. I have learned to read labels and I really watch the fat."

This concept of self-directed learning in adulthood is pervasive in the adult education literature: "Self-directed learning . . . is a form of study in which learners have the 'primary' responsibility for planning, carrying out, and evaluating their own learning experiences" (Merriam & Caffarella, 1991, p. 41). "A great number of adults are engaged in individual learning projects. Probably 90% of the adult population conducts at least one major learning effort per year and 73% of the projects are self-planned. Most adults are indeed self-directed and independent" (Tough, 1978, p. 258). And finally, "Self-directed learning has most often been used to describe a form of study in which people take the primary initiative, with or without the help of others for planning, conducting, and evaluating their own learning activities" (Knowles, 1970, p. 26).

Closely related to the concept of self-direction are the concepts of intrinsic motivation and self-efficacy. Sylvia is a true self-directed learner, and she was probably the best example of intrinsic motivation. After suffering a stroke at 73, she is working hard to recover. She is attending physical therapy and the aqua exercise class, learning to use a computer for rehabilitation, and planning a trip to Arizona for part of the winter. Rather than giving up and allowing others to care for her, she is relearning to care for herself.

In the humanistic learning process, motivation is intrinsic rather than extrinsic. . . . For humanists, motivation is not something put upon learners, it emanates from the learner. . . . Perhaps more than any other characteristic of humanist education, intrinsic motivation characterizes adult learners. In most adult educational settings, the adult learners are there, not because they have to be, but because they want to be. Most adult students engage in learning activities under no compulsion except that which is generated from within. (Elias & Merriam, 1980, p 127)

This is demonstrated by the fact that these people are regular exercisers. They rarely miss the aqua exercise class, they come in smiling and eager to get started, and are very vocal if class has to be canceled for any reason.

When examining exercise participation, locus of control and self-efficacy are two psychological constructs that have come from social learning theory (Waller & Bates, 1992) as well as adult learning theory (Elias & Merriam, 1980; McKeachie, 1988).

Internal and external locus of control . . . describe how one's outcome expectations are under one's own (internal) or others' (external) control. Individuals who are more internal believe that they are individually responsible for outcomes, while people who are more external believe that outcomes are controlled by luck, chance, or powerful others. (Waller & Bates, 1992, p. 303)

Those who are most active and healthy, at any age, tend to display the greatest amount of internal control. For the elderly, internal locus of control is also associated with greater activity in organizations and volunteer work (p. 303). Malcolm Knowles describes the "salient features of adulthood" beginning with: "As a person matures his or her self-concept moves from one of a dependent personality toward one of a self-directing human being" (in Darkenwald & Merriam, 1982, p. 76).

Self-efficacy is an important construct in maintaining healthy behaviors. If people practice healthy behaviors, their self-efficacy improves. Also, it has been demonstrated that aging itself tends to improve self-efficacy (Waller & Bates, 1992, p. 304). "In motivation theory we now realize that the students' sense of competence, of efficacy in the situation, is important" (McKeachie, 1988, p. 11). As individuals age, their accumulation of experiences gives them the confidence or self-efficacy to believe they can accomplish whatever task they may encounter (Knowles, 1970).

A prime example of the development of self-efficacy was an experience Emma Marie still painfully remembered. "As a

child I was very heavy. At that time there was a candy bar called a 'Fat Emma Bar.' And kids being what they are--I was called Fat Emma. And that stuck with me for a long time." Since then, she has lost weight and reached a high level of fitness.

Further, the concept of self-direction is closely related to the concept of learning strategies. For individuals to be self-directed, they must have some awareness of the learning strategies that work best for them to establish, plan, conduct, and evaluate their learning. Lynn knew that "I'm a slow reader. I like to get up in the morning and read. That's when I'm really awake and can concentrate."

To be able to maintain their lifestyle, these participants have become aware of those components required to do so. This awareness is evident in their self-efficacy enabling them to be internally motivated. Tied to their motivation and self-efficacy is their utilization of learning strategies to plan, direct, and evaluate their self-directed learning activities, including exercise.

Zest for Life

Each of the participants displayed a great enjoyment of life. Their mannerisms and enthusiasm in answering the questions reflected this. They enjoy traveling, learning new things, being active in the community, socializing at the

senior citizens' center or at the exercise classes, and just getting out and staying active.

Cindy attributed her lifestyle to her being able to continue to do things.

I still enjoy going out and working cattle. I go out to Jackie's and help her with the sheep. . . . I don't think most people know how old I am, mostly because of my lifestyle. When I'm doing things [with friends] they say, "Oh, she's so much younger than we are!" I'm really not.

Anita also talked about exercise and age. "I'm a firm believer in exercise. That's the reason I'm so well and people don't believe I'm the age I am." Since having back surgery, Toby complained, "I can't do the things I like to do. I don't have the energy. . . . I have to go take a nap."

Lynn talked about exercise and her 90 year old mother.

I always thought it was very important for people to be active. That's the reason I had mother move into the manor [Eagles Manor Retirement Home] so she has to walk to get her meals. She also goes to the exercise class there. I really think it helps keep her alert.

Lynn also talked of an experience she had one day while teaching a class. "All of a sudden I realized 'I liked my life.' I was contented. I didn't have to do things for other people, to please them." At that moment she became critically aware of herself and her life. Though not necessarily as dramatic as Lynn's statement, all of the participants were aware of the connection between exercise and its impact on their satisfaction with their lifestyle. "Thus, self-evaluation, intrinsic motivation, self-concept,

perception, and discovery are all important components in the learning process for learners of any age" (Elias & Merriam, 1980, p. 127).

Learning Background

The majority of this group were former teachers. Cindy and Lynn had been physical education and home economics teachers; Molly also taught home economics. Anita, Sylvia, and Marietta were elementary teachers. As such, they were required to teach all subjects, including physical education. Joe was an English teacher who did a lot of coaching while teaching in the high schools.

Cindy's parents had college degrees in physical education although they did not teach. Her father graduated in 1914 and her mother in 1917 from the University of Iowa. Lynn's mother was also a teacher prior to marriage; her father did not have a college degree but saw the benefit of an education. "Mother was clear that we would go to college, and dad never refused." All of the participants had attended college during or just after the Depression. Lynn marveled, "I went to school for the year on \$1,000. Imagine that! And that paid for everything: books, room and board, and any other expenses."

Toby and Emma Marie attended college, but did not graduate with a degree. They reported the least amount of exercise activity during their employment years. Emma Marie

remembered, "Work was pretty much my day. I didn't exercise much because I was so busy all day with that." Toby was somewhat more active, but not during the years she was a stay-at-home mother, working out of her home. "My exercise was chasing after the children, trying to keep up with them."

World War II had a profound effect on the participants. Many of them moved to the west coast during the war to work. Even after the war, all of the women continued to work. Even though they may have interrupted work to have children, they do not fit the popular stereotype of a stay-at-home mother during the 1950s and 1960s. Sylvia remembered that "anytime I wanted to take time out to have a baby, they [the principal and school board] were good about it. Then in a couple of years, when I was ready to come back, they would have a position for me."

Anita returned to college and went to work out of necessity. After her husband suffered a back injury, he was uncertain about his continued employment so it was necessary for her to return to college to earn a degree. She was then able to teach to support their family. She went beyond the initial degree by completing a master's and then completing much of the course work towards a doctorate.

While it has been demonstrated that people with higher levels of education participate in more leisure-time physical activity than do people with less education (Pate

et al., 1995), the participants in this study, for the most part were physically active prior to and during their formal education years. In addition, most also mentioned a time in their lives when they were not as active, but they had all returned to physical activity as part of their lifestyle. Thus comes the classic chicken-and-egg question: were the participants more active because of their education, or did their education allow for increased time to continue with an active lifestyle? Either way, the participants of this study were all educated beyond high school, with seven of the nine obtaining a college degree. This occurred in an era when most people did not graduate from high school, and many did not go past eighth grade. This substantial formal education has in turn formed the basis for their continued participation in lifelong learning activities. One area has been in physical fitness.

Childhood

All of the participants spoke of being very active as children. Cindy, Marietta, and Lynn were responsible for helping on the family farm. Lynn reflected about one summer:

Dad had my brother and a hired man, but he fired the hired man when I got home from college. Dad was burned badly and couldn't work, so we [she and her brother] did all of the farming that summer. I could fix almost anything, change oil, things like that.

Cindy's love of horses began as a child helping her father care for their teams. "I could drive a team of four horses," she recalled proudly.

Toby was a self-described "tomboy" as a child. "We played kick-the-can, tag, and I loved volleyball." Again, this does not fit the popular stereotype of "proper young ladies" who stayed in the house reading or doing needle-work.

Due to the economics of the time during which they grew up, walking was the most common form of transportation. As Lynn pointed out, "Very few people had cars in those days, so we walked." Marietta's first teaching job was in a one-room school house. She lived with a family and walked two miles to the school and back each day for four years.

Social factors can affect physical activity behavior (Pate et al., 1995). "Family and friends can be role models, provide encouragement, or be companions during physical activity" (p. 404). In Bandura's social modeling theory, learning occurs through observing others and internalizing the outcomes (Bandura, 1971).

Although most of the participants did not talk directly about their parents' attitudes or involvement in physical activity, two assumptions can be drawn. First, the time period these participants were raised in required much physical activity on the part of everyone. Many did not have electricity, running water, or gas heat. Automobiles were

scarce; many people still relied on horses or walking as the major means of transportation. Second, their parents to some degree were indulgent in allowing their children to be physically active. Lynn did comment that "Mother always encouraged [me] to do new things." From this indirect form of modeling from their parents, most were exposed to and allowed to participate in physical activity from a young age.

In summary, learning patterns did not reveal many clues as to why these people have continued to exercise throughout their lifetimes. Other factors influenced by or related to learning such as educational background, life experiences, awareness of the benefits of exercise, self-directedness or intrinsic motivation, and enjoyment of life did play a part in their continued participation.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Two separate, but connected phenomena have gained attention in the last few years. First is the recognition that regular exercise or participation in fitness activities leads to a decrease in a myriad of diseases. Many of these diseases are considered "diseases of lifestyle" in that they have a strong connection to diet and exercise habits (Pate et al., 1995; Sharkey, 1990). Secondly, America is seeing a "graying" of the population. A larger percentage than ever of the population is older than 65 years of age (Fowles, 1994).

Even with the recognition that regular physical exercise decreases the incidence of disease and aids in the process of a "successful aging," less than 30% of the population maintains an exercise program for any period of time (Pate et al., 1995; Sharkey, 1990). Researchers have examined the reasons for this lack of participation with little conclusive results. One model that attempts to explain both exercise participation and ways to improve participation is the Personal Meaning Fitness Education

Model (Rehor, 1991). Key components of this model are the self-efficacy of the participant and comparison of personal beliefs or actions to the social norm. These two concepts help explain individual as well as societal reasons for exercising.

The concept of being influenced by the social norm is reflected in Bandura's (1971) Social Learning Theory. From this theory, it can be concluded that exercise is a type of learning. However, no research has examined the influence of learning patterns on fitness participants. Therefore, the purpose of this study was to describe the learning patterns of a group of older individuals who were currently participating in fitness and exercise activities. These individuals have maintained a high level of fitness over their lifetime. The investigation of learning patterns was based on the learning styles framework of Kolb; the auditory, visual, and kinesthetic modalities of learning; and learning strategies based on the SKILLS framework.

This research was a qualitative case study of nine individuals from a university-based aqua exercise class who have been lifelong fitness participants. The participants were 60 years or older and have been exercising or have remained active throughout their lifetime. Eight of the participants were women and there was one male participant. This closely resembles the demographics of the class.

Participants were interviewed to examine their exercise lifestyle and learning patterns.

Learning patterns did not reveal many clues as to why these people have continued to exercise throughout their lifetimes. Other factors influenced by or related to learning such as awareness of the benefits of exercise, educational background, past lifetime experiences, self-directedness or intrinsic motivation, and enjoyment of life did play a part in their continued participation.

Conclusions

Learning Patterns and Fitness Participation

- (1) Learning style is not a predictor of long-term participation in fitness or exercise for this group of individuals.
- (2) The participants have critically reflected upon their lives. To be able to continue with the lifestyle they have and wish to continue, they recognize the importance of fitness in maintaining this lifestyle.
- (3) Intrinsic motivation or self-directedness is a factor in fitness participation. Included in self-directedness is the awareness of self and individual needs.
- (4) Past education and life experiences are important contributors to lifetime participation in fitness. This was a group of people who were active throughout their

lives, who were educated, and sought opportunities for activity.

- (5) Adaptation and change to life circumstances are important elements in maintaining participation in a fitness lifestyle. Metacognition strategies such as planning, monitoring and adjusting as well as critical thinking skills allow these people to evaluate past experiences in relation to new ones.
- (6) These participants are still vital, contributing members of society. They are actively learning and participating in life; they are not sitting on the porch in a rocking chair watching life go by.

Discussion

While learning style was not a predictor of lifetime fitness participation, the application of other principles of adult learning related to these participants' continued participation in physical fitness activities. From the interviews, the participants described a lifestyle in which learning related to physical fitness is a process more closely related to critical reflection than the traditional cognitive processes expressed in the form of learning style. Learning styles demonstrate how an individual learns or how information is best assimilated and processed, but they have no predictive value for continued fitness participation. Rather, the key to continuation of fitness participation

appears to be through an individual contemplating the consequences of participation in physical fitness activities and recognizing the benefits of this participation on other aspects of a chosen lifestyle.

The participants have developed an awareness of the difference in how they feel when they are not exercising and when they do. This awareness is similar to a process called critical reflection; in this process learning "is centrally concerned with the development of a critically aware frame of mind, not with the uncritical assimilation of previously defined skills or bodies of knowledge" (Brookfield, 1986, p. 17). Exercise itself is not always a pleasant activity, causing discomfort and other unpleasant body feelings at times. These individuals have been able to differentiate between the short-term physical discomfort of exercise and both the physical and emotional long-term discomfort they experience when they do not exercise. In the case of Marietta and Sylvia, they overcame not only the physical discomfort of exercise itself but also the discomfort and challenge of recovering from a stroke to resume a normal life that includes physical activity. This demonstrates a characteristic of adult learning that, while learning may not always be a pleasurable activity, adults will recognize the long-term benefits and continue in the face of adversity (Brookfield, 1986). Further, most of the participants noted a time in their lives when they were not as active as other

times. After thinking about the effects of this inactivity, they consciously decided to resume a fitness lifestyle.

Eduard Lindeman (1926/1961) was the first to talk about adult education and critical reflection.

[Critical reflection] represents a process by which the adult learns to become aware of and to evaluate his experience. . . . He begins by giving attention to situations in which he finds himself, to problems which include obstacles to his self-fulfillment. Facts and information from the differentiated spheres of knowledge are used, not for the purpose of accumulation, but because of need in solving problems. (Cited in Knowles, 1970, p. 51)

Knowles (1970) further discussed the differences in learning experiences between children and adults. Adults bring more experiences into the learning situation. They use past experiences to solve new problems. This is done through the critical reflection on those past experiences to gain meaning from them. This new meaning is then applied in future learning situations.

Schon (1987) and Brookfield (1986) support the concept that critical reflection on past experiences is a significant trait of adult learners. The term praxis refers to a process that "centers on the need for educational activity to engage the learner in a continuous and alternating process of investigation and exploration, followed by action grounded in this exploration, followed by reflection on this action, followed by further investigation and exploration, followed by further action, and so on"

(Brookfield, 1986, p. 15). This ability to critically reflect on experiences and learning also is important for the development of self-efficacy and self-direction (p. 18).

Myles Horton (Moyers, 1990) further defines this connection between learning and experience. The experience itself is not learning. The critical reflection on that experience creates new meaning, and the process is learning.

The three domains of learning are the cognitive, affective, and psychomotor (Bloom, 1956). The cognitive domain includes learning objectives which deal with the development of intellectual abilities and skills; the affective domain includes objectives which deal with changes in interests, attitudes, and values and with appreciation and adequate adjustment for those changes; the psychomotor domain is the manipulative or motor-skill area (p. 7). If evaluated within the context of Bloom's Taxonomy, the critical reflection on an experience is the cognitive component of learning; the self-efficacy and self-directedness developed from that reflection is the affective component of learning; and the manifestation of a behavior such as exercise is the psychomotor component of learning.

Coupled with this critical reflection on the benefits of fitness is self-directedness from intrinsic motivation. This self-direction has allowed the participants to continue against the social norm of inactivity. While their peers may not be as active, they voluntarily continue to seek out new

learning activities and participate in exercise classes. Emma Marie and Toby talked of a time in their lives when they were not as active as they are now. Yet, they have been able to change their lifestyles to one of fitness, even without a great deal of general social support. Further, the participants of this study refuse to conform to the social perception of what it means to be old.

All of these participants had an education beyond high school. This raises the classic question: Did education afford them the economic ability to have more leisure time to exercise, or did education afford them the ability to recognize the importance of exercise? Regardless of which came first, the participation pattern of these adults in exercise activities supports the general adult education research finding that educational attainment is the most potent factor in predicting participation in adult education activities (Darkenwald & Merriam, 1982, p. 121).

The two individuals with the least amount of education are the two who report the greatest amount of time during adulthood without participation in regular fitness activities. Emma Marie remembered about the time she was working with her husband in their business: "Work took up so much time. Even when you came home you were still thinking about work. The activity I got while I was at work was about all of the exercise I did." Toby talks of her exercise patterns while she was a stay-at-home mother working out of

their basement: "The most exercise I got was chasing after the children and trying to keep up with them."

The others found ways to be active even with their jobs. They taught physical education and participated with the children when they did. Joe was a coach and did the same thing with his players. Later, they enrolled in exercise classes or did things on their own to maintain their fitness level. It is probably not a coincidence that these individuals chose professions that allowed them to continue the activity patterns established as children.

Throughout their lifetimes, the participants have continually adapted to change. The number of changes these individuals have witnessed in their lifetimes is staggering: electricity, the automobile, the telephone, television, air travel, computers, and all of the other technology taken for granted in daily life today in America. They have not shied away from it, but rather they looked upon it as a challenge. Cindy vocalized this very well. "It's [your] attitude. It's a great life out there, and challenge is a great part of it. You try to accept it and do different things and never be scared of the challenge."

This acceptance of a challenge is demonstrated in the number who have learned to use a computer and in how they have embraced other changes related to technology. Emma Marie bragged, "I finally got an answering machine yesterday. Everyone tells me they call and I'm not home."

Many of them have made several airplane trips to points all over the world. They did not resist change but accepted it and adapted to it. They even seem to enjoy it.

Concurrently, they have adapted to changes within themselves. Cindy has gone from running to walking and using her exercise machine due to arthritis in her knees. They all recognized the benefits of aqua exercise to their fitness level with the reduced risk of injury provided by the water. Marietta has learned to compensate for loss of memory from her stroke and continues to learn new things. Sylvia is relearning to do everything for herself after her stroke. Toby and Anita are anxiously awaiting the opportunity to return to class after surgeries. They have not let physical changes or setbacks deter them from activity and learning for any period of time. Throughout their lives they have modified their activities or chosen new ones to accommodate changes in their lives.

This adaptation to change and critical reflection are components of Maslow's theory of self-actualizing. These people have reached the point in their lives where they are content with themselves, enjoy their lives, seek new experiences, and don't feel the need to conform with the social norm (Darkenwald & Merriam, 1982, p. 80).

Recommendations

Physical Education

Physical education needs to move from a skills-based model to a personal meaning model to help instill long-term fitness as part of an individual's lifestyle. First, children need to be taught the basic motor and manipulative skills of running, jumping, hopping, skipping, galloping, leaping, throwing, kicking, striking, catching, bending, twisting, and stopping. These are the foundations of all other movements (Gallahue, 1982).

Then, children need to be exposed to a variety of physical fitness opportunities. This exposure needs to be approached from a lifetime skills aspect. People need to learn to ask, "What skills do I need to participate in this activity throughout my lifetime? Do I like this activity?" By having the basic understanding of a variety of activities, individuals can choose those that appeal to them to continue in their personal fitness lifestyle.

Currently, skills are taught as a means to an end (Rehor, 1991) or as a lead-up to competition. Competition typically excludes those least physically capable and most in need of continued participation. Competition, as well, does nothing to instill self-efficacy in those individuals either because of lack of success or because of non-participation. At the same time, what happens to the fitness

patterns of those individuals who enjoy competition when it is over? Will they have the intrinsic motivation to continue when the cheering stops?

Game skills need to be taught within the framework of noncompetitive, lifetime fulfillment (National Association for Sport and Physical Education [NASPE], 1995). Individual success should be the focus, along with recognition through reflection on how the individual feels while exercising and how they feel when they do not. Competition should be left to those who wish to join a team organized for the purpose of competition.

Educators of physical education teachers need to also make this paradigm shift from teaching skills for the sake of improving skills to teaching skills as part of lifetime fitness activities. New teachers going out into the field need to be able to help participants recognize the physical and emotional effects of long-term physical activity and avoid falling into the trap of "rolling out the ball and letting them play." New physical educators need to know not only how to teach skills but also how to help children adopt a physical fitness lifestyle through self-directedness or intrinsic motivation. This can help children be able to overcome social norms and habits of inactivity. Children will not understand nor care about the long-term implications of physical activity, but they can be taught how to reflect on the difference in how they feel when they

exercise and when they do not. Removing the competitive atmosphere will also allow all participants the opportunity to develop self-efficacy through success and achievement by reaching personal goals. This is different than the current emphasis on the competition goals of winning.

Fitness Industry

The fitness industry is a multi-million dollar a year business (Wellness Councils of America, 1993). Health clubs, fitness centers, hospital-based wellness centers, as well as the YMCA and YWCA provide opportunities for adults to participate in fitness activities. While many are interested in the welfare of their clients, they are also interested in the bottom line. Having people drop their membership is not good for business as well as the individual. The challenge for the industry, then, becomes one of attracting and retaining members.

Many adults begin an exercise program because of a perceived need to become physically active in order to lose weight, decrease risk of disease, or develop a different body image (Godin & Shepard, 1990; Marcus, Pinto, Simkin, Audrain, & Taylor, 1994). Whatever the need, most people drop out of an exercise program after just a few weeks (Pate et al., 1994). Even though the intention was raised and the self-direction was there to start the program, something happens and the individual does not follow through. What is

missing is the recognition that each individual needs to have a program that is personally meaningful and is designed to meet specific goals and needs. Further, the individual must have the strategies to follow through with the program long enough for it to be adopted into the lifestyle like the participants in this study. This requires critical reflection on the part of the individual on the effect exercise is having on the overall lifestyle. To do this, recognition of the physical and emotional benefits of the activity need to be pointed out if they are not recognized. This enhances the personal meaning of the activity. Capitalizing on the learning strategies of Reward/Enjoyment and Confidence can help develop the intrinsic motivation and self-direction needed to be successful.

Gradually, as more and more people adopt a fitness lifestyle, the social norm may shift to one more supportive of activity. In the meantime, employees of fitness facilities must help provide the social support for these individuals until self-efficacy is established to assist in the adoption of a fitness lifestyle.

Adult Education

The development of lifelong fitness can be viewed as a learning activity. The skills necessary for fitness to become part of an individual's lifestyle are teachable. Based on the principles of adult education, most people

enter into a fitness program of their own determination. Unfortunately, they may not recognize the tools necessary to continue long enough for fitness to be incorporated into their lifestyles. Teaching people how to recognize that self-determination is an important key to self-efficacy and intrinsic motivation will help individuals recognize the skills they have acquired throughout their lives that will enable them to successfully adopt a fitness lifestyle. This revelation of previously unrecognized skills is part of the process of critical reflection and can lead to adoption of a fitness lifestyle.

As Brookfield (1986) noted, not all learning is a pleasurable activity. Adult educators must prepare people for the fact that learning causes change and at times that change may be difficult or unpleasant. Self-efficacy is the tool needed for adults to overcome this difficulty. This, in turn, will help insure the adoption of a change that resulted from learning. As Freire (1970) discusses and as these seniors demonstrated, this can come about through the critical reflection upon one's experiences.

Another principle of adult education that may actually hinder the adoption of a fitness lifestyle is that of immediacy of application (Knowles, 1970). Fitness is not something that necessarily shows immediate results. Weight loss, increased strength, or cardiovascular fitness does not happen overnight. It is not possible for people to see the

removal of plaque from their artery walls due to exercising. The results are much more subtle.

Without self-efficacy and a belief that these things are happening, many people become discouraged or frustrated and quit. At some level, they must believe these things are really going to happen, and then they need the intrinsic motivation and self-determination to continue even without visible changes. Education and examples set by others will assist in adoption of a personal belief that exercise is worthwhile. Critical reflection on other aspects of the impact of exercise on their lives by an individual will help with the time requirement needed to see results toward those initial goals.

Another challenge of adult educators is to help individuals view changes as challenges and not as threats. Many people do not have the self-efficacy to cope with change (Knowles, 1970). Adopting fitness into a lifestyle is a dramatic change for most people. It requires restructuring the day and placing exercise as a priority along with other demands. Again, the desire to make a change is only half the battle. A person needs to reflect on what impact these changes will make on other components of one's life. Further, effective strategies must be developed to help overcome obstacles to the implementation of exercise into the lifestyle. People need to learn how to use resources to not only develop a program but to develop a plan of

successful implementation. Critical thinking skills can aid in the evaluation of a program as well as the plan to implement it. Metamotivation skills of Reward/Enjoyment and Confidence can help with the maintenance of an exercise program through the development of self-efficacy.

Society

Physical fitness is an important component for a healthy lifetime. The participants of this study demonstrated the agelessness of physical activity. They established a lifestyle of fitness and activity as children. Their parents allowed them the opportunity to be active. They found ways to remain active throughout their lives or to re-establish it after a period of inactivity. They have not let age, illness, or society influence their decision to participate in a fitness lifestyle. Physical fitness is not a means to an end, but rather it is the mechanism that allows them to maintain the active lifestyle they desire.

Today, parents need to provide children opportunities to be active. Children need to have safe, open places to play. They need to turn off the television and go find those places. Because social modeling is an important component for the learning and adoption of a fitness lifestyle, parents need to join their children in the pursuit of activity. They need to help children reflect on the benefits of an active lifestyle and cultivate the skills of intrinsic

motivation and self-efficacy for the development and maintenance of a fitness lifestyle.

There is no age limit to fitness. People of any age should become more active. They need to seek out opportunities for fitness and recognize and reflect upon the long-term physical and emotional benefits of exercise. Advancing age should not be a reason to opt out of life and activity.

Suggestions for Further Study

Education is not enough. The health profession has been promoting fitness for over 20 years with little effect on participation rates. Personal intention needs to be raised. Fitness as a lifestyle needs to become personally meaningful to each individual, and it needs to be integrated into one's lifestyle. This can be accomplished through critical reflection.

It is evident from the findings of this research that the wrong questions were asked in designing this project and in the interviews with the participants. The concepts of learning styles and strategies were originally used as a framework for learning. However, the concept of learning through critical reflection emerged from the data. Learning styles were not predictive of participation. Critical reflection about the implication of fitness on the individual's ability to maintain a chosen lifestyle was a

common factor among these participants. Further, other events in these individual's lives such as education, childhood, and adaptation to change contributed to long-term participation in physical fitness activities.

Further research should focus on (a) determining when these people became aware of the connection between fitness and continued lifestyle, (b) uncovering how they became aware of this connection, and (c) determining how this can be taught to others. Studying larger groups of participants who are involved in formal classes as well as individually directed activities can further knowledge of this connection among critical reflection, self-efficacy, and lifetime fitness.

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