1976

Physical activity attitudes of senior citizens in Montana

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PHYSICAL ACTIVITY ATTITUDES OF SENIOR CITIZENS IN MONTANA

by

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B. A., University of Montana, 1972

Presented in partial fulfillment of the requirements for the degree of

Master of Science

UNIVERSITY OF MONTANA

1976

Approved by:

Chairman, Board of Examiners

Dean, Graduate School

Aug 13, 1976

Date

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9-8-76

ABSTRACT

Swanson, Mark B., M.S., July 1976 Recreation

Physical Activity Attitudes of Senior Citizens in Montana (72pp.)

Director: Lloyd Heywood

The purpose of the study was to ascertain whether demographic characteristics were significant predictors of senior citizens' attitudes toward physical activity. Demographic surveys and semantic differential attitude surveys were administered at 18 senior citizen centers throughout the state of Montana.

Data were subjected to demographic frequency counts to determine the makeup of the best population, as well as a profile analysis of the semantic differential to gauge the general positive or negative tendencies of attitude. Testing of the hypotheses was achieved through an analysis of variance for significance of variance both between the demographic groups and within each demographic subgroup.

The following conclusions were drawn from the collected data:

1. Negative attitude scores were achieved for 15 of 20 semantic word pairs, with an average score of 3.44 on a seven point scale with 4.0 indicating neutrality.
2. Sex and age are significant as predictors of attitude toward physical activity, while educational levels, occupational status and yearly income are not.
3. There was a tendency toward more positive attitude among males, college graduates, among the still-employed, and among the middle income groups, while advancing age indicated a deteriorization of positive attitude.
4. Generally the attitude of senior citizens toward physical activity was negative.

ACKNOWLEDGEMENTS

The author expresses sincere appreciation to his advisor, Dr. Lloyd Heywood for his guidance, patience, and time; to committee members Dr. John Dayries for his suggestions, and Dr. Paul Miller for lighting the path to the world of computers; to Sandy Robbins for relenting to type just one more thesis; to the senior citizens whose data will offer insight into the realm of aging; and to his parents for making it all possible.

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CHAPTER I

INTRODUCTION

The aged are a special and unique segment of the American population. Between 1900 and 1960 the population of the United States multiplied two and one half times. In the same period, however, the aged population (65 and over) increased five times. In 1900 there were 3.1 million aged, in 1960 there were 16.7, in 1970 there were 20.1, and by 1990 the figure will reach 28 million. The reason for the unique status of the aged, particularly in American society, may be attributed to two major factors. The first is the dissolution of the nuclear family. Increased mobility, advancing technology, and multiple marriages all have contributed to the breakdown of family units. Beyond this, however, is the inevitability of the children striking out on their own. The second contribution to the isolation of the aged may be attributed to the loss of an occupational status. Much of one's position in adult life has been dictated by and regarded as relative to one's occupation. Social and business relations play important roles in daily living and recreational pursuits. The sudden loss of this base can have strong effect upon enjoyable retirement years, and the accompanying marked increase in leisure time. While these and other factors may be unavoidable, one important faction of American life which can and should contribute to a healthy transition to the retired life is physical activity.

Physical activity patterns are generally assumed to change in accordance with advancing age, much as the adherence to the notion that as years accumulate, wisdom sets in. A cloud of mystery has pervaded the phenomenon of aging, and studies are being carried out in a multitude of disciplines in an effort to unfurl the shrouds enveloping this natural occurence. Bailey (3) and Zborowski (53), studying the relationship of leisure pursuits and age, found that activities established in early years tend to persist into older age. Desroches, et al, (15), tested a group of elderly men (mean age 61.3), retested them four years later, and found no significant change in activity patterns. These surveys would offer that although participation frequency may decline, as expected, activity selection does not necessarily change.

Kuhlen (30) suggested that the younger years are dominated by growth-expansion motives, while insecurity and threat pervade motivation during the later years. The elderly become sedentary, both physiologically and socially, in their ability to confront, perceive, and react to new, or long-forgotten stimuli. Tests conducted by Hollman (24) asserted that physical training was futile in persons over the age of 60 unless the subjects had led vigorously active lives, in which case the rate of decline decreases. Conversely, Fox and Skinner (19), investigating the relationship of physical activity to cardiovascular disease, found that recent physical activity was more important than activity earlier in life, and that even moderate physical activity may have significance for cardiovascular health. Other similar studies concurred that physical fitness (2, 16, 48) and activity (11, 39) decrease with advancing age. Socially, results of motivational

behavioral tests ranged from increased social interaction (51), to nonsignificant activity changes (15, 39), to a tendency toward social isolation (9, 31).

These studies have proven very enlightening when attempting to ascertain behavioral patterns, but the questioning can be taken a step further by asking if there is any basis for the patterns which emerge. If so the implication is that by having a given set of discrete variables, the results of tests upon one group should be similar to those of another group with common characteristics. In other words, if a pattern can be found regarding physical activity attitudes of selected senior citizen test groups, it should be possible to predict, or hypothesize for a larger segment of the aged population.

Perhaps the strongest motivation for pattern may be attributed to psychological motivation. A measurable extension of this is attitude, or a consistency of response to a specific stimulus or set of stimuli. Kenyon (28) defined attitude as a "...relatively stable behavioral disposition reflecting both direction and intensity of feeling toward a particular object, whether it be concrete or abstract." Webster's dictionary (52) simply defined it as "one's disposition." McDonald (35) defined attitude as "a predisposition to action; a state of readiness to act in a particular way; what a person thinks or feels about a certain subject; a generalized state of the individual; an orientation process which enables a person to interact selectively with his environment." He explained that attitudes imply a subject-object relationship and may be related to objects, people, places, events or abstract ideas contained within the environment of the individual. They have

direction in the sense that they represent a positive or negative preference for the attitude object. Because of the intensity factor which characterizes attitudes, people may feel more or less strongly about a certain subject, but these feelings are usually marked by relative stability and consistency. According to Mista (36), if attitudes are to be changed, the individual must have new experience relevant to the desired attitude. She suggested that this can be done through the presentation of facts, but that direct involvement has proven to be more effective.

Statement of Problem

It was the purpose of this study to ascertain whether there is significant consistency between discrete independent variables, in the form of a demographic inventory, and a dependent variable, in the form of a survey of attitude toward physical activity. Accomplishment of this was achieved through the administration of a written questionnaire in two parts. The first asked for demographic information, the second was in the form of a semantic differential.

Specifically, the problem of this research was to ascertain whether certain demographic factors have significant effect upon the attitudes of senior citizens toward physical activity. The problem was investigated through the testing of five different hypotheses, each of which related to a separate demographic factor.

Hypotheses

The hypotheses tested in this study included the following.

Hypothesis I

There is no significant difference between the sex of respondents and their respective attitudes toward physical activity.

Hypothesis II

There is no significant difference between the age of respondents and their respective attitudes toward physical activity.

Hypothesis III

There is no significant difference between the educational attainment of the respondents and their respective attitudes toward physical activity.

Hypothesis IV

There is no significant difference between the occupational status of the respondents and respective attitudes toward physical activity.

Hypothesis V

There is no significant difference between yearly income of the respondents and their respective attitudes toward physical activity.

Significance

The significance of this study existed in its attempt to gauge through attitudes, the success of a large segment of American society in adjusting to the dissolution of family life, loss of occupation, increased mobility, technological advance, and increased leisure. Though intangibles such as the effects of technology or increased mobility can not

be tested, it has been possible to isolate a group - the aged - that has lost to some extent its position as producer, both in the progenerative sense and the business sense. The results of this study may offer some insight into the effects of aging in American society upon attitudes toward physical activity, which has been shown to be physically, psychologically, and emotionally beneficial in the assumption of a healthy constitution. Another significant aspect of this study may be in its indirect assessment of senior citizens' adjustment to suddenly increased leisure time. This information may and should be of interest to senior citizen center directors, recreation specialists, physical therapists and all associated with the provision of service to the elderly.

Delimitations

The following delimitations were in existence in this study.

1. Two hundred twenty-seven members of eighteen senior citizen centers within the state of Montana comprised the population tested in this study.

2. The test consisted only of measurement of attitude toward physical activity.

3. The makeup of the test required response within finite limits of the semantic differential.

Limitations

Limitations of the study were as follows.

1. The tests were administered by the individual senior center

directors. Therefore, factors such as verbal instructions given or the motivations of the directors may have contributed to differing attitudes toward the test instrument, resulting in slightly varied responses.

2. Surveys were not administered to all members of the centers. The tests were administered by the directors at discretionary times and events and all members may not have been in attendence.

3. Respondents may have had differing conceptions of the meaning of the term "physical activity." No specific definition was given which allowed the respondents to establish their own meaning for the term. (See Appendix B for specific directions which accompanied the test.)

Basic Assumptions

It was assumed for the purpose of this study that by testing a given set of discrete variables, results for the test group would be similar to those of another with common characteristics. In other words, if a pattern could be found regarding physical activity attitudes of selected senior citizen test groups, it would be possible to predict or hypothesize for a larger segment of the aged population. It was also assumed that peoples' responses would be constant, regardless of circumstances which could contribute to differences, such as external factors like the time of day testing was done, or personal problems. The assumption was made that the respondents would have attitudes toward physical activity and that the test instrument, a semantic differential, would be capable of an accurate assessment. Finally, it was assumed that the tests would be competently administered by the center directors.

Definitions

The following definitions were in effect for this study.

1. Attitude - Attitude is "...a consistency of responses to a specified set of stimuli, or social objects." (19)

2. Physical Activity - Physical activity refers to "...organized (structured), nonutilitarian (in an occupational or maintenance sense), gross human movement, usually manifested in active games, sports, calisthenics, and dance." (24)

3. Senior Citizen - A senior citizen is regarded as anyone fifty five years of age and over.

CHAPTER II

REVIEW OF LITERATURE

The review of literature for this study has been divided into three sections: (1) a history of attitude definition, (2) the measurement of attitudes, and (3) a summary of scientific inquiry into the implications of physical activity for the aged. This last section specifically reviewed physiological, psychological, and sociological testing and the aged.

Attitude Definition

In pursuing an adequate understanding of attitude measurement it is helpful to trace the evolution of its meaning. Its earliest use was in the 17th Century as a technical term referring to the physical positioning of an artist's subject with respect to the background. In 1695 in Dufresnoy's Art of Painting, Dryden stated that, "The business of a painter is his choice of attitudes." The term grew from merely a description of posture, to include speculation of predisposition. In the late 1800's, with the advent of the early stages of modern psychology, studies of "task-readiness" led to suppositions of, or referrals to, mental sets, task-attitude, and predisposition to act. The first extensive use of attitude as a key concept was attributed to two social psychologists, W. I. Thomas and F. Znaniecki, who studied the attitudes of Polish peasants during and after World War I. The

potential applications of attitude measurement were observed and absorbed in the 1920's by the behaviorists. Confusion arose, however, as psychologists, psychiatrists, and sociologists attempted to mold attitude definitions to fit their needs. To illustrate the variety Nelson (40) in 1939 offered a summary of the various definitions in use:

1. Organic drives.
2. Purposes.
3. Motives.
4. A "core of affect".
5. The emotional concomitants of action.
6. Permanently felt dispositions.
7. A special case of disposition.
8. Generalized conduct.
9. A neural set, or a neuromuscular set.
10. A stabilized set.
11. A state of readiness.
12. A disposition modifying rising experience.
13. Verbal responses for or against a psychological object.
14. Socially compelled behavior of an enduring type.
15. A response which is more obviously a function of disposition than of the immediate stimulus.
16. The result of organization of experience.
17. A directive or dynamic influence on the response to which related.
18. A determiner of the direction of an activity.
19. A guide for conduct. A point of reference for new experience.
20. A trial response-substitute behavior.
21. A way of conceiving an object. A posture of consciousness.
22. A "sum total of inclinations, feelings, notions, ideas, fears, prejudices, threats, and convictions about any specific topic.
23. An integration of the specific responses into a general set.

Since the 1930's, definitions of attitude have narrowed to consist primarily of two conceptions within a single framework of stimulus-response occurence. The first conception is basically the notion of probability of recurrence of behavior forms. The second type of attitude conception is termed a "latent process conception", or the existence of some "hidden or hypothetical variable...which shapes, acts upon, or mediates the observable behavior." In other words, the attitude is

not the manifestation itself, or its probability, but an intervening variable operating between stimulus and response and inferred from the overt behavior. (13)

Rokeach (46) agreed, but carried the notion a bit further with his own definition that an attitude is "a relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner." He offered that each belief within an attitude is perceived to have three components:

> a cognitive componenet, because it represents a person's knowledge, held with varying degrees of certitude, about what is true or false, good or bad, desirable or undesirable; an affective component, because under suitable conditions the belief is capable of arrousing affect of varying intensity centering around the object of the belief,...taking a positive or negative position; and a behavioral component because the belief, being a response predisposition of varying threshold, must lead to some action when it is suitably activated.

The importance of Rokeach's discussion was its suggestion of a predisposition to act, or a motivation. There has been some disagreement as to the extent of action required, ranging from Horowitz (25), who saw an attitude as "a response rather than a set to respond," to Doob (17), who viewed attitude strictly as a behavioralist and defined it as "an implicit response." Most researchers agreed however, that an attitude is a predisposition of some sort, whether it be to respond, evaluate, experience, or to act. Allport (1) summarized several author's concurring definitions on the basis of predisposition:

> (An attitude is) readiness for attention or action of a definite sort. (Baldwin)
>
> ...a condition of readiness for a certain type of activity. (Warren)
>
> ...a complex of feelings, desires, fears, convictions, prejudices or other tendencies that have given a set or readiness to act... (Chave)

An attitude is a mental disposition of the human individual to act for or against a definite object. (Dobra)

We may think of attitudes as acquired tendencies to act in specific ways toward objects. (Krueger and Reckless)

The Measurement of Attitude

One of the most widely used methods of measuring attitudes has been that of quantification through the use of scales. Several methods have been promoted. Among the most popular are the Thurstone Scales, the Likert Scales, the Guttman Scales, the Edwards Scales, and the Semantic Differential Scale developed by Osgood. All of these scales have been based on the assumption that attitudes are latent variables that cannot be measured directly, but can be inferred from observations of a subject's responses to a selected set of graded statements or responses. (13) As the semantic differential was used for this research project, a short background has been given. (41)

The semantic differential is basically a method of assessing the meanings of objects to individuals within a finite polar space. In the case of the semantic differential the polar limits are assigned contrasting adjectives, such as: good-bad. The notion of using polar adjectives was conceived by Karwoski and Odbert, during research on synesthesia, wherein a certain stimulation elicits a secondary, or subjective response, such as when a certain color evokes a specific taste sensation.

Osgood studied anthropological reports on five widely separated primitive cultures. His findings indicated a parallel in assignment of value relationships: good places, high social positions, etc., were related with "white" and "up"; bad things were always "black" and "down".

In 1946 Osgood and Stagner developed a seven point polar scale to test the impact of war on a nationalistic frame of reference. The intent of the seven gradation scale was to establish finite possibilities of response. Scoring of the responses could then be limited to two criteria: direction from origin (the origin is established as the central, or fourth, gradation within the seven point scale), and distance from origin.

At this point Osgood and Stagner observed that at least three distinct dimensions existed within the adjective pairings. Categories were established to isolate the highly intercorrelated clusters: evaluative, suggesting "good-bad" value judgment; potent, "strong-weak; and active, "fast-slow" judgments. This allowed assessment of total attitude toward a concept, as well as observation as to whether or not certain individual dimensions were at variance with others.

The Aging and Physical Activity Research

Physical activity research dealing with the aged can be divided into four categories: physiology--the science of functions and vital processes of living organisms; psychology--a science dealing with the mind and with mental and emotional problems; sociology--the study of social relations, beliefs, and organizations; and participation patterns--the actual activity patterns of the aged.

Physiological Aspects

Physiological studies of the aged have indicated a variety of opinion as to the benefits of physical activity. Gerontological reports have produced varying results. This report has attempted to indicate this span through the disclosure of selected reports.

Hollman (24) stated that physical training initiated after age 40 can cause slight effects of adaptation. However, after the age of 60 "there is practically no observable effect." De Vries (14) concurred and added that "even in physically active, vigorous men, aging results in decreased work capacity." However, he further added that the rate of gerontism has been slowed, a fact with which a majority of researchers tend to agree. Simonson (48) stated that, "It appears that training will counteract the effect of age on physical fitness... This applies to the maintenance of performance through continuous training into higher age." Fox and Skinner (19) tended to disagree with Hollman's assertion of futility after age sixty and reported that after investigating the relationship of physical activity to cardiovascular disease they found recent physical activity to be more important than activity earlier in life, and that even moderate physical activity may have significance for cardiovascular health. Others (4, 32) concurred that physical activity is beneficial for the general satisfaction of physical well-being, defined as a feeling-state, as a freedom from somatic symptoms, and as an ability to perform the acts of daily living (5). Nevertheless, the way an individual regards his own health status may be more important than the actual condition and can be an important indication of psychological health.

Psychological Aspects

Psychological study centers around the responses of the aging individual to physical or social change. Pollak (43) identified the types of change within the individual as changes in needs, changes in physical and mental capacities, and changes in predispositions. Within

the individual's social environment, the changes consisted of changes in one's social role and changes in one's status. Pollak stated that these were interrelated and that any change in one factor would alter others. Physical and psychological needs--to be loved, to feel needed and useful, to belong, and to feel self fulfilled--remain unchanged with advancing age. But with retirement, and other losses of social contact, the avenues for achievement of psychological needs become limited. Much research has concluded that deteriorization is not organic, but a result of the conditions under which the aged live. Morris (38) concluded that senility is not inevitable, but a "cultural artifact", resulting from economic, social, and intrapersonal stresses that lead to feelings of insecurity, isolation, and rejection. Many researchers agreed that preparation for retirement was a key to successful aging. The strength of occupation as a socialization factor prompted Morris (37) to suggest the following set of components for a pre-retirement program for the aged: a mixture of work and nonwork activities; improved pre-retirement preparations; extension of community services; and new opportunities for retirement income. The fact that life spans are increasing, along with more stringent union and civil service regulations, point to ever increasing years of retirement, and make action even more imperative to provide for enjoyable aging. For, while a study by Shanas, et al, (47) indicated that the attitude of the aged in Denmark and Britain toward retirement was one of a "period of doing nothing or resting after a lifetime of work," the attitude of Americans was that retirement was "a time for activity."

Psychological examinations of aging have covered a span ranging from physiological causes to sociological effects. Kuhlen (30) stated

the theory that growth-expansion motives dominate the first half of life while insecurity and threat motivate the second half. He offered that the aged become sedentary due to social pressure of role expectations, psychological awareness of body degeneration, skill deficits generated by technology, and frustration with the inability to influence circumstances. While there are many studies of the psychological aspects of aging, most ultimately can be attributed to awareness of physiological degeneration, or to the social pressure of role adaptation.

Sociological Aspects

Studies by sociologists referred to environmental factors to explain social interactions, organizations, and implications. Findings once again vary as to interaction. Vogel and Schell (51) found that retirees, depending upon educational and socioeconomic levels, preferred greater interaction as the levels increased. Kuhlen (31) attributed increased activities to increased leisure time, while Desroches and Kaiman (15) found very little flux over a four year span with a study of Veteran's Administration hospital residents. A great number of studies, however, indicated decreased activities for a variety of reasons. As previously mentioned, Kuhlen (30) suggested psychological as well as sociological explanations. Briggs (7) and Cavan, et al, (9) reported slight increases upon retirement but progressively declining participation. Cowgill and Baulch (10) and Kuhlen (30) reported a marked increase toward social isolation. Pressey and Kuhlen (44) reported that with increasing age there is "a decrease in liking for activities involving physical skill and daring... (and a) greater

dislike for changing activities." At the same time, numerous studies (3, 6, 11, 53) offered that though there was decreased participation, as would normally be expected, there was no significant alteration in the selection of activities. In other words, activities established in early years tended to persist into older age groups.

Participation Patterns

Physical activity participation patterns of the aged vary for two basic reasons, health and personality, according to Havinghurst (21), who identified nine different categories of leisure activity:

1. complementary to work
2. homemaking
3. family life
4. church activities
5. civic-political activities
6. professional activities
7. social club activities
8. informal personal social activities
9. purely free choice activities

Havinghurst concurred with others that the selection of these activities are dependent on the health and the personality of the individual, and emphasized that the aged are individuals with differing needs and should not be assumed to desire total engagement or, at the other extreme, total disengagement.

In conjunction with this, Riley and Foner (45), cited differences in definition and assessment of life situations among the young and the aged as contributive to differing participation habits. First, the older people tend to have less of a sense of mastery over their own fate. Secondly, older people stress the responsibility of the individual for his own destiny, whereas youth tend to stress environmental influences. Thirdly, the elderly tend to expect setback as inevitable, and

deal with it more as an adaptive process, rather than the young who seek corrective or preventative treatment. But Riley and Foner saw no lack of ability to participate when committed to a particular activity. Thus, they felt that though activity levels may decrease, the explanation may be due to differing definitions and evaluations of situations rather than any necessary tendency toward passivity.

Cumming and Henry (12) offered the hypothesis that retirement and subsequent reduced activities are accepted as well as expected, and therefore result in happier old age. Henry (22) agreed, offering a theory of "intrinsic disengagement," which stated that disengagement is not only a positive aspect of aging, but an important prerequisite.

A study by Maddox (34) showed a positive correlation between social activity and positive morale. Follow up studies of the same test group several years later showed a decrease in activity but a maintenance of high morale, indicating an acceptance of increased isolation. But another follow up of the test group concurred with the findings of Lehr and Dreher (33) that showed a strong desire for increased social contact, as the aged passed the age of 70.

Some insight into the actual participation activities and habits can be gained through the review of studies by Cunningham, et al, (11) who attempted to isolate activity selections and participation rates according to age. They found that participation frequency decreased with age as well as the intensity of participation. They also showed a tendency away from sporting activities toward more isolated or passive activities such as lawn mowing, gardening, fishing, and walking. In contrast, Bultena and Wood (8) studied 322 men retirees in

planned retirement communities, and found participation frequencies to be markedly higher in 14 of 15 different categories. The only category which declined was fishing and hunting. Studies such as these should be regarded with caution however as to their application to the present study. The Cunningham, et al, test spanned a large age group of men with varying demographic features, while the Bultena and Wood study was restricted exclusively to men who had moved from Midwestern states to Arizona retirement communities with planned activities.

While all of these reports touched the realm of aging, it can only be stated that physiological, psychological, sociological and participation inputs are all important contributors to the formation of positive, constructive attitudes toward physical activity. Perhaps Spring (49) best touched the task of gerontologists when she stated that "leaders currently providing services for older people sometimes do not understand the problems or particular needs of this group."

CHAPTER III

METHODS AND PROCEDURES

Collection of the Data

In order to test the hypotheses associated with this study it was necessary to isolate a study group with the commonality of senior citizen status. This was accomplished by administering the tests within senior citizen centers throughout the state of Montana. The tests were given to the center directors with instructions to administer them at the next large center gathering. In all, tests were administered to 227 senior citizens in the 18 centers (see Appendix A). The tests were in the form of two written inventories, the first of which was a demographic survey asking sex, age, highest level of educational attainment, occupational status, and approximate yearly income. The second inventory was in the form of a semantic differential (see Appendix B). A seven point summated rating scale was used, with respondents to assign their judgments in the form of polarity, the direction corresponding to reactions elicited by the terms, and the distance from neutrality corresponding to the intensity of the reaction.

Scoring of the Data

In scoring the tests, values were assigned, ranging from 1 to 7 for each of the polar word pairs, in accordance with the seven points along the rating scale. The number 7 was assigned to the extreme point

adjacent to the polar adjective found to have the more positive relationship to the key word, "Physical Activity". The number 4 was assigned to the center position, and was regarded as a neutral response. The number 1 was assigned to the extreme point adjacent to the polar adjective found to have the most negative, or least positive, relationship. These affixations of numbers were in accordance with criteria established by Osgood (41). One word pair, masculine-feminine, with nonpolar connotations was used as a check on neutral response occurrence. In this case the masculine pole was arbitrarily assigned the more positive response, though it was expected that the mean score would be near the neutral position. Within the makeup of the test itself the polar adjectives were broken down into three domains according to basic attitude dimensions or factors found to be inherent within the terms, again according to criteria established by Osgood (41). He defined these categories as: a) evaluative, terms implying "good-bad" value judgments, b) potent, "strong-weak", and c) active, "fast-slow", i.e. motion oriented. Making up the total of 20 polar sets were 11 evaluative word pairs, 4 potency, and 5 active. The sequence of the word pairs, as well as their polar positioning, were mixed to prevent mind set occurrence. The word pairs within the evaluative domain were: worthless-valuable, meaningless-meaningful, painful-pleasurable, difficult-easy, boring-interesting, inhumane-humane, disreputable-reputable, irresponsible-responsible, unintelligent - intelligent, sick-healthy, foolish-wise. Within the potent domain the word pairs were: weak-strong, delicate-rugged, feminine-masculine, fragile-tough. Within the active domain the word pairs were: passive-active, awkward-graceful, dangerous-safe, slow-fast, unemotional-emotional.

Organization and Treatment of the Data

The data obtained from the questionnaires were coded on to 80-column IBM punch cards and processed utilizing the codebook from Statistical Package for the Social Sciences (SPSS). (50) The data were initially subjected to a frequency count to determine the demographic makeup of the group and to assess the impact of nonresponses on the outcome of testing.

The second analysis conducted was a profile analysis of the mean scores for the entire test group. The mean scores were divided into their semantic domains in order to observe any positive or negative tendencies within attitude toward physical activity.

Testing of the hypotheses was achieved through an analysis of variance for each of the demographic variables by the semantic differential to determine whether the individual demographic characteristics were significant (.05 level) predictors of attitude. Each of the demographic variables were analyzed by the total word pair test, as well as by the three individual semantic domains: evaluative, potent, and active. This breakdown into domains was desired in order to determine whether certain domains were overly influencing the grouped scores.

Finally, the data were subjected to a multiple classification analysis, which provided deviation scores for each of the subgroup categories of the demographic variables from the grand means of the semantic word pair responses. The data were then further broken down into the semantic domains to gauge the deviations from grand means of each demographic subgroup within each semantic domain. These deviations

were then submitted to a test of correlation, in the form of an eta test, which measures significance of variance within the independent variables.

CHAPTER IV

ANALYSIS OF DATA

The analysis and discussion of data compiled from the demographic questionnaire and semantic differential ahs been presented in this chapter. The procedure of the analysis was four-fold. Initially a frequency count was made to determine the demographic makeup of the composite study group. The second step in the analysis was to group the bipolar adjectives within the semantic differential into their respective domains, chart them by mean scores, and observe the directional tendencies of the group as a whole. It was determined unnecessary to factor load the word pairs (41) as analysis was comparative within demographic subgroups of the total test group, and because all respondents were subjected to identical word pairs. Testing of the hypotheses was achieved through an analysis of variance of the five demographic variables - sex, age, educational attainment, occupational status, yearly income - by the score of the total semantic scale. This was then further broken down into the three semantic domains - evaluative, potent, active - and analysis of variance was applied to determine significance of variance attributable to the component domains. Finally, a multiple classification analysis was done in order to determine if there were any trends or tendencies apparent within the demographic categories for both the total scale and the semantic domain groups.

The analysis has been presented in narrative form supplemented by tables where appropriate for visual comparisons. This chapter has been divided into four sections, one of which corresponds to the hypotheses under test and the others relating to a descriptive or tabular account of the population sample and their responses to the questionnaire.

It should be noted here that there were a number of respondents that failed to answer certain questions. In the analysis a category labeled "No Response" was used to indicate the number of cases. Those responses were included within absolute and relative frequencies, but were eliminated from adjusted frequency and all subsequent analysis.

Demographic Description of the Population

There were a total of eighteen senior citizen centers in towns of varying size and in all geographic areas of the state included in the study. It was assumed that this would provide a good cross section of the state's aged population. Tests were administered by the center directors with instructions to conduct them at the next large gathering of center members. A total of 227 tests were returned from the eighteen centers, of which 180 cases contained sufficient information for analysis. Following is a description of the demographic makeup of the test population.

Sex of Respondents

The test group was predominantly female. Of the 171 valid questionnaires returned 127 (74.3%) were women, and 44 (25.7%) were male. Nine questionnaires did not have an answer to this question.

Table 1 describes the questionnaire response according to the sex of the respondent.

Table 1

Sex of Respondents[a]

Category	N	Relative Frequency(%)	Adjusted Frequency(%)
Male	44	24.4	25.7
Female	127	70.6	74.3
No Response	9	5.0	--
Total	180	100.0	100.0

[a]Valid Cases -- 171

Age of Respondents

Respondents' age was grouped into three categories. Fifteen respondents (8.3%) indicated age of less than 60; thirty-two (17.8%) indicated age between 60 and 65; and 111 (61.7%) indicated that they were over the age of 65. There were twenty-two (12.2%) that failed to respond to this question. Table 2 describes the questionnaire response according to the age of the respondent.

Table 2

Age of Respondents[a]

Category	N	Relative Frequency(%)	Adjusted Frequency(%)
< 60	15	8.3	9.5
60-65	32	17.8	20.3
> 65	111	61.7	70.3
No Response	22	12.2	--
Total	180	100.0	100.0

[a]Valid Cases -- 158

Educational Attainment of Respondents

The educational attainment indicated that approximately three times as many respondents were grade or high school graduates as opposed to college or graduate school graduates. Responses indicated that fifty-two (28.9%) had at leat eight years of schooling and that sixty-seven (37.2%) had a high school education. Thirty-two (17.8%) indicated college, while eleven (6.1%) indicated graduate school. There were eighteen nonrespondents, comprising 10% of the total. Figures for the educational attainment of the test respondents are shown in Table 3.

Table 3

Educational Attainment of Respondents[a]

Category	N	Relative Frequency (%)	Adjusted Frequency(%)
1-8 Grade	52	28.9	32.1
9-12 Grade	67	37.2	41.4
College	32	17.8	19.8
Graduate School	11	6.1	6.8
No Response	18	10.0	--
Total	180	100.0	100.0

[a]Valid Cases -- 162

Occupational Status of Respondents

Response to this question was directed to one of two choices: employed or retired. Twenty (11.1%) indicated they were still employed, while 147 (81.7%) indicated that they were retired. There were thirteen nonresponses, comprising 7.2% of the total. Table 4 indicates the occupational status of the test group.

Table 4

Occupational Status of Respondents[a]

Category	N	Relative Frequency (%)	Absolute Frequency (%)
Retired	147	81.7	88.0
Employed	20	11.1	12.0
No Response	13	7.2	--
Total	180	100.0	100.0

[a]Valid Cases -- 167

Income Levels of Respondents

Income questioning garnered the highest nonresponse level, with sixty-three (35.0%) failing to respond. Of those that did respond seventy-five (61.4%) indicated incomes of less than $3000. Those indicating incomes of $3000-$4999 totalled twenty-four (13.3%). Those with incomes between $5000 and $7499 totalled five (2.8%), nine (5.0%) indicated income between $7500 and $9999, and four (2.2%) indicated income in excess of $10000. Table 5 indicates the income level of test respondents.

Table 5

Income Levels of Respondents[a]

Category	N	Relative Frequency (%)	Absolute Frequency (%)
< $3000	75	41.7	64.1
3000-4999	24	13.3	20.5
5000-7499	5	2.8	4.3
7500-9999	9	5.0	7.7
> 10000	4	2.2	3.4
No Response	63	35.0	--
Total	180	100.0	100.0

[a]Valid Cases -- 117

Summary

To summarize the demographic makeup of the test group, approximately 75% of the respondents were female, 70% were over 65 years of age, there was a 3 to 1 ratio of grade and high school graduates to

college and graduate school graduates, nearly 90% were retired, and nearly 65% reported incomes of less than $3000 per year.

Profile Analysis

The second step in the treatment of the data was to plot the mean scores for the word pairs to observe the directional tendencies of the test group.

Throughout the semantic domains the tendency was toward the negative. Of the twenty word pairs, there were five above the neutral score of 4, and fifteen were below or to the negative side. The grand mean for the entire test by the entire group was 3.37. This would indicate that the group as a whole regarded physical activity negatively. Further insight can be seen by aligning the word pairs into their semantic domains - evaluative, active, and potent. A grand mean of 2.44 for the evaluative domain indicated a markedly negative attitude when physical activity was conceptualized as a "good-bad" value judgment. There were a total of eleven word pairs in the evaluative category, with individual mean scores as follows: worthless-valuable, 6.24; difficult-easy, 4.75; painful-pleasurable, 1.89; disreputable-reputable, 1.85; foolish-wise, 1.85; inhumane-humane, 1.81; irresponsible-responsible, 1.77; sick-healthy, 1.77; meaningless-meaningful, 1.73; unintelligent-intelligent, 1.66; and boring-interesting, 1.55. These scores for the evaluative domain indicated that as a whole the attitudes of the test group were extremely negative. Only two of the eleven word pairs had means above 2 on a 7 point scale.

In the potent domain, with four word pairs, means indicated that only one pair, weak-strong, with a mean of 4.98, was above the neutral mean of 4. The other three word pairs were below 4 but all were above a mean of 3. They were: delicate-rugged, 3.97; fragile-tough, 3.33; and feminine-masculine, 3. The grand mean for the potent domain was 3.88.

The five word pairs in the active domain were also less extreme than the evaluative domain, but varied more than the potent domain. The grand mean for the active domain was 3.79. Passive-active had a mean of 5.91 and unemotional-emotional had a mean of 4.25. The other three were below the neutral. Slow-fast had a mean of 3.87; awkward-graceful had a mean of 2.89; and dangerous-safe had a mean of 2.03. Table 6 illustrates rank order mean scores of semantic differential word pairs relating to physical activity.

Testing of Hypotheses

Analysis of variance is a method of determining significance between multiple means. In the testing of hypotheses for this project, it was desired to determine whether the dependent variable in the form of a semantic differential, was affected significantly (.05 level) by the independent demographic variables. It was further desired to isolate the semantic domains - evaluative, potent, and active - to note their contributions to the total attitude score. Within the analysis of variance tables, two sources of effect are given: the main effect, i.e., the idependent variable, and the residual effect, which is the amount of variance which may not be attributed to the independent

Table 6

Rank Order Mean Scores of Semantic Differential Word Pairs Relating to Physical Activity

Word Pair	Domain	Mean Score
Worthless/Valuable	Evaluative	6.24
Difficult/Easy	Evaluative	4.75
Painful/Pleasurable	Evaluative	1.89
Disreputable/Reputable	Evaluative	1.85
Foolish/Wise	Evaluative	1.85
Inhumane/Humane	Evaluative	1.81
Irresponsible/Responsible	Evaluative	1.77
Sick/Healthy	Evaluative	1.77
Meaningless/Meaningful	Evaluative	1.73
Unintelligent/Intelligent	Evaluative	1.66
Boring/Interesting	Evaluative	1.55
Weak/Strong	Potent	4.98
Delicate/Rugged	Potent	3.97
Fragile/Tough	Potent	3.33
Feminine/Masculine	Potent	3.25
Passive/Active	Active	5.91
Unemotional/Emotional	Active	4.25
Slow/Fast	Active	3.87
Awkward/Graceful	Active	2.89
Dangerous/Safe	Active	2.03
Grand Mean (20 Word Pairs)		3.37
Grand Mean (Evaluative Domain)		2.44
Grand Mean (Potent Domain)		3.88
Grand Mean (Active Domain)		3.79

variable. The effect of the independent upon the dependent variable is shown in the column categories: sum of squares, which is the sum of squared deviations about the mean; degrees of freedom (DF), the number of available choices the respondent may make other than the one actually selected; mean squares, which is the average of the sum of squares when divided by the degrees of freedom; and variance (F), the probability that the means of the individual groups differ from each other at some level of significance.

The first analysis conducted was an analysis of variance for the total semantic scale by the demographic variables. By combining the semantic domains of the dependent variable it was possible to gauge the level of significance attributable to each demographic category for the entire test. It was then possible to investigate the individual categories within the demographic variables through a multiple classification analysis (MCA), which can be seen as a refinement of variance analysis. While there are a number of means tested within analysis of variance, a strong deviation from the grand mean by a single value will severely alter the significance level. Multiple classification analysis can be described as a method of viewing individual means as deviations from the grand mean.

Another computation of MCA is eta. Basically eta is an indication of how dissimilar the means of the dependent variable are within the categories of the independent variable. When eta is squared (eta^2), it may be interpreted as the proportion of variance in the dependent variable attributable to the independent variable. When the means are identical eta^2 will equal zero, and as the means increasingly vary eta^2 will approach a maximum value of 1.0.

The following section provides analysis of variance and MCA statistics for the total attitude scale.

Sex

The first hypothesis tested was that the sex of the respondent would have no significant effect upon attitude toward physical activity. A total of 171 cases were processed, with forty-four males and 127 females responding. An F ratio of 8.91 was achieved, well over the F ratio of 3.91 needed for significance at the .05 level. Thus in this test, the null hypothesis of no significant effect of sex upon attitude toward physical activity was rejected. Table 7 shows the analysis of variance for effect of sex upon attitude toward physical activity. Further analysis was gained through MCA scores. Deviation for the males was above the grand mean (4.02), while the females deviated below the grand mean (-1.39). However, the eta^2 score of .05 indicated that these were not significant deviations when the total semantic test was submitted to analysis. Domain analysis of these deviations are available in the next section of this report, Semantic Attitude Domain Testing. Nevertheless, within the test group, the males tended to regard physical activity more positively than the females. (Results of multiple classification analysis for the total semantic test are shown in Appendix C.)

Age

The age of the respondents had significant effect upon attitude toward physical activity. There were a total of 158 respondents, fifteen below the age of 60, thirty-two were between 60 and 65, and 111 were

Table 7

Analysis of Variance Data for Effect of Sex on Attitude Toward Physical Activity

Category	DF	Sum of Squares	Mean Squares
Sex	1	958.655	958.644
Residual	169	18117.192	107.546
Total	170	19133.836	112.552

F-ratio obtained - 8.914

F-ratio required for .05 level of significance - 3.91

Table 8

Analysis of Variance Data for Effect of Age on Attitude Toward Physical Activity

Category	DF	Sum of Squares	Mean Squares
Age	2	889.782	444.891
Residual	155	16250.927	104.845
Total	157	17140.709	109.176

F-ratio obtained - 4.243

F-ratio required for .05 level of significance - 3.06

over the age of 65. An F ratio of 4.24 was attained. This was above the F ratio of 3.06 needed for significance at the .05 level. Thus, the null hypothesis of no significant effect of age upon attitude toward physical activity was rejected. Results of analysis of variance for effect of age upon attitude toward physical activity are shown in Table 8. Through MCA testing, deviations were well above the grand mean for the under 60 age group (6.30), still above the grand mean for the 60-65 age group (1.71), but below the grand mean for the over 65 age group (-1.34). The eta^2 score of .052 indicated little significance for these deviations for the semantic test as a whole, but further breakdown into the semantic domain is available in the next section of this report. It can be noted however, that there appeared to be a deteriorization of positive attitude with advancing age. (MCA statistics for the total semantic test are shown in Appendix C.)

Education

The educational attainment of the respondent was non-significant regarding attitude toward physical activity. From a total of 162 responses, fifty-two had completed first through eighth grade, sixty-seven had a high school education, thirty-two were college graduates, and eleven had completed graduate school. An F ratio of 0.78 was attained, well below the F ratio of 2.67 required for rejection at the .05 level of significance. Table 9 shows the analysis of variance for effect of educational attainment upon attitude toward physical activity. Results of MCA testing were insignificant also. The categories of first through eighth grade and college graduates were above the grand mean, with deviations of .26 and 2.23 respectively. The categories

of having a high school degree and having completed graduate school deviated below the grand mean, at -1.2 and -.36 respectively. An eta^2 score of .015 indicated that these deviations were insignificant. There did not appear to be a correlation between educational attainment levels and attitude toward physical activity. (Results of MCA testing are shown in Appendix D.)

Table 9

Analysis of Variance Data for Effect of Educational Attainment on Attitude Toward Physical Activity

Category	DF	Sum of Squares	Mean Squares
Education	3	261.686	87.229
Residual	158	17661.122	111.811
Total	161	17927.808	111.353

F-ratio obtained - 0.780

F-ratio required for .05 level of significance - 2.67

Occupation

Occupation was a non-significant factor regarding attitude toward physical activity. Of a total of 167 respondents analyzed, 147 were retired and twenty were still employed. An F ratio of 3.15 was attained, slightly below the F ratio of 3.91 needed to indicate significance at the .05 level. Thus the hypothesis of no significant

effect of occupation upon attitude toward physical activity was not rejected. Table 10 shows the analysis of variance statistics for effect of occupation upon attitude toward physical activity. Multiple classification analysis indicated a negative deviation for the retired (-.54), and a positive deviation for the still employed (3.96). The eta^2 value of .015 indicated little significance in these deviations for the entire semantic word test. However, a tendency was apparent for a more positive attitude among the still employed. (MCA statistics are shown in Appendix C.)

Table 10

Analysis of Variance Data for Effect of Occupational Status on Attitude Toward Physical Activity

Category	DF	Sum of Squares	Mean Squares
Occupation	1	356.713	356.713
Residual	165	18691.119	113.280
Total	166	19047.832	114.746

F-ratio obtained - 3.149

F-ratio required for .05 level of significance - 3.91

Income

Income levels showed nonsignificant effect upon attitude toward physical activity. There were a total 117 cases processed. Seventy-five reported yearly incomes of less than $3000, twenty-four reported

incomes between $3000 and $4999, five reported incomes between $5000 and $7499, nine were between $7500 and $9999, and four reported incomes in excess of $10,000. An F ratio of 1.13 was attained. This was below the F ratio of 2.46 needed for significance at the .05 level. Thus, the null hypothesis of no significant effect of income upon attitude toward physical activity was not rejected. Statistics for analysis of variance data for the effect of income upon attitude toward physical activity are shown in Table 11. MCA testing showed a negative deviation in two categories. Those below $3000 had a deviation from the grand mean of -1.10, and those above $10,000 had a deviation of -.54. Deviating above the mean were the $3000-4999 group at .29, the $5000-$7499 group at 3.76, and the $7500-$9999 group at 6.51. An eta^2 score of .039 indicated that these deviations were non-significant, but there appeared to be a more positive attitude with increased income other than the over $10,000 group. However, there were only four respondents contributing to the deviation score for the over $10,000 group. (MCA statistics are shown in Appendix C.)

Table 11

Analysis of Variance Data for Effect of Income Levels on Attitude Toward Physical Activity

Category	DF	Sum of Squares	Mean Squares
Income	4	545.644	136.411
Residual	112	13561.142	121.082
Total	116	14106.787	121.610

F-ratio obtained - 1.127

F-ratio required for .05 level of significance - 2.46

Semantic Attitude Domain Testing

The next step in the analysis of the data was to apply the analysis of variance and multiple classification analysis to each of the semantic domains - evaluative, potent, and active. Thus it was possible to observe whether or not demographic variables had particular influence upon specific domains of semantic groups. Following is a description of the findings of the test procedures.

Sex

The significance of the F ratios obtained for the evaluative (1.14) and active (1.47) domains did not exceed the F ratio of 3.91 required for significance at the .05 level. Therefore the null hypotheses of no significant effect of sex upon evaluative and active semantic domains of attitude measurement were not rejected. On the other hand, the potent domain resulted in a very high F ratio (24.02), well above the F ratio of 3.91 required for significance at the .05 level. In this case, the null hypothesis of no significant effect of sex upon the potent domain was rejected. Thus it can be stated that when physical activity was judged, within the potent domain of "strong-weak" value judgments, there was a significant effect of sex upon the attitude. The statistics for analysis of variance for significance of sex upon the evaluative, potent, and active domains of semantic space are shown in Table 12. MCA statistics indicated males to have a more positive attitude throughout the evaluative (E), potent (P), and active (A) domains. Deviations for the males were .91 (E), 2.39 (P), and .73 (A). The females deviated below the grand mean with scores of -.31 (E), -.83 (P), and -.25 (A). Significance of these deviations, as

Table 12

Analysis of Variance Data for Effect of Sex on Evaluative, Potent, and Active Domains Regarding Attitude Toward Physical Activity

Domain	Category	DF	Sum Squares	Mean Squares
Evaluative				
	Sex	1	48.591	48.591
	Residual	169	7178.719	42.478
	Total	170	7227.310	42.514
Potent				
	Sex	1	337.981	337.981
	Residual	169	2378.101	14.072
	Total	170	2716.082	15.977
Active				
	Sex	1	31.439	31.439
	Residual	169	3627.298	21.463
	Total	170	3658.737	21.522

F-ratio obtained (Evaluative) - 1.144
F-ratio obtained (Potent) -24.019
F-ratio obtained (Active) - 1.465

F-ratio required for .05 level of significance - 3.91

indicated by eta^2 scores of .007 (E), .124 (P), and .009 (A) was low however. (MCA statistics for deviation and eta^2 values from grand means of semantic differential domains by demographic variable categories are shown in Appendix D.)

Age

Low significance levels were achieved for two semantic domains, evaluative (1.70) and potent (.63). These both exceed the F-ratio of 3.06 required for significance at the .05 level. Therefore, the null hypotheses of no significant effect of age upon the evaluative and potent domains were not rejected. However, one domain did indicate a high significance of the F-ratio attained. The active domain, with an F-value of 6.00, exceeded the established F-ratio of 3.06 required for significance at the .05 level. In this case, the null hypothesis of no significant effect of age upon the active domain was rejected. Therefore, when phyiscal activity was judged within the active domain there was a significant effect of age upon the attitude. Analysis of variance statistics for the effect of age on evaluative, potent, and active domains regarding attitude toward physical are shown in Table 13. MCA testing indicated a deterioration throughout the semantic domains with increasing age. The under 65 group scored most positively with deviations of 1.96 (E), .65 (P), and 3.69 (A). The 60-65 group also deviated above the grand mean with deviations of 1.16 (E), .49 (P), and .06 (A). The over 65 group had consistently negative scores with deviations from the grand mean of -.60 (E), -.23 (P), and -.52 (A). Though eta^2 scores of .021 (E), .008 (P), and .072 (A), indicate little significance, it is possible to see a deterioration of positive attitude

Table 13

Analysis of Variance Data for Effect of Age on Evaluative, Potent, and Active Domains Regarding Attitude Toward Physical Activity

Domain	Category	DF	Sum Squares	Mean Squares
Evaluative				
	Age	2	140.297	70.148
	Residual	155	6402.671	41.308
	Total	157	6542.968	41.675
Potent				
	Age	2	19.752	9.863
	Residual	155	2446.224	15.782
	Total	157	2465.949	15.707
Active				
	Age	2	234.466	117.233
	Residual	155	3028.502	19.539
	Total	157	3262.968	20.783

F-ratio obtained (Evaluative) - 1.698
F-ratio obtained (Potent) - 0.625
F-ratio obtained (Active) - 6.000

F-ratio required for .05 level of significance - 3.06

with advancing age. (Statistics for deviation and eta^2 values from grand means of semantic differential domains by demographic variable categories are shown in Appendix D.)

Education

Education was not a significant factor in attitude scores achieved for the three semantic domains. The evaluative domain had an F-ratio of 1.90, the potent domain an F-ratio of .70, and the active domain had an F-ratio of 1.12. All of these were below the F-ratio of 2.68 required for significance at the .05 level. Therefore, the null hypothesis of no significant effect of educational attainment on attitude domains was not rejected. Analysis of variance for significance of education on the evaluative, potent, and active domains are shown in Table 14. MCA statistics for the individual domains showed no clear evidence of consistency. The 1-8 grade category had deviations of .92 (E), .30 (P), and -.95 (A). The high school graduates had deviations of -1.23 (E), -.54 (P), and .57 (A). The only group with positive deviations from the grand mean in all three domains were the college graduates with deviation scores of 1.45 (E), .52 (P), and .26 (A). The graduate school graduates attained deviations of -1.05 (E), .39 (P), and .30 (A). Eta^2 scores of .035 (E), .013 (P), and .021 (A) indicate little significance of these deviations. (Appendix D shows deviation and eta^2 values from grand means of semantic differential domains by demographic variable categories.)

Table 14

Analysis of Variance Data for Effect of Educational Attainment on Evaluative, Potent, and Active Domains Regarding Attitudes Toward Physical Activity

Domain	Category	DF	Sum of Squares	Mean Squares
Evaluative				
	Education	3	225.806	75.269
	Residual	158	6265.281	39.654
	Total	161	6491.281	40.317
Potent				
	Education	3	34.206	11.402
	Residual	158	2585.572	16.364
	Total	161	2619.778	16.272
Active				
	Education	3	71.733	23.911
	Residual	158	3385.878	21.430
	Total	161	3457.611	21.476

F-ratio obtained (Evaluative) - 1.898
F-ratio obtained (Potent) - 0.697
F-ratio obtained (Active) - 1.116

F-ratio required for .05 level of significance - 2.68

Occupation

Occupation was not significant in influencing attitude within the evaluative, potent, or active domains of semantic space. Attitude scores for the evaluative domain attained an F ratio of 3.56, the potent domain attained an F ratio of .04, and the active domain attained an F ratio of 2.52. None of these exceeded 3.91, the ratio required for significant effect of occupation upon semantic domains of attitude toward physical activity was not rejected. Statistics for analysis of variance for significance of occupation upon the evaluative, potent, and active domains of semantic space are shown in Table 15. MCA testing indicated that the still employed scored higher in two domains, evaluative and active, while the retired scored higher in the potent domain. Deviations from the grand mean for the still employed were 2.58 (E), 1.16 (P), and 1.54 (A). Deviations for the retired were -.35 (E), .02 (P), and -.21 (A). Eta^2 scores of .021 (E), .000 (P), and .015 (A) show little significance for these deviations. (Statistics for deviation and eta^2 values from grand means of semantic differential domains by demographic variable categories are shown in Appendix D.)

Income

Only 11.1%, or a total of eighteen, indicated incomes above $4,999. Therefore, that indication suggested that most achieved variation could be attributed to the predominanty represented lower two income groups, under $3,000 and $3,000-$4,999. Results indicated that the null hypotheses of no significant effect could not be rejected. The evaluative domain had an F ratio of .44, the potent domain had an F ratio of 1.47, and the active domain had an F ratio of 0.62. None of

Table 15

Analysis of Variance Data for Effect of Occupational Status on Evaluative, Potent, and Active Domains Regarding Attitudes Toward Physical Activity

Domain	Category	DF	Sum of Squares	Mean Squares
Evaluative				
	Occupation	1	141.796	151.796
	Residual	165	7034.923	42.636
	Total	166	7186.719	43.293
Potent				
	Occupation	1	0.601	0.601
	Residual	165	2689.603	16.301
	Total	166	2690.204	16.206
Active				
	Occupation	1	53.894	53.894
	Residual	165	3529.507	21.391
	Total	166	3583.401	21.587

F-ratio obtained (Evaluative) - 3.560
F-ratio obtained (Potent) - 0.037
F-ratio obtained (Active) - 2.519

F-ratio required for .05 level of significance - 3.91

these exceeded the F ratio of 2.46, required for significance at the .05 level. Analysis of variance for significance of income upon the evaluative, potent, and active domains are shown in Table 16. MCA testing indicated a tendency for the $5000-$7499 and the $7500-$9999 groups to be generally more positive in their attitude toward physical activity. The specific breakdown of deviations were as follows. For the less than $3000 group the deviations from the grand mean were -.21 (E), -.50 (P), and -.39 (A). For the $3000-$4999 group the deviations were -.04 (E), -.01 (P), and .34 (A). For the $5000-$7499 group deviations were 1.62 (E), 1.06 (P), and 1.08 (A). For the $7500-$9999 group the deviations were 1.97 (E), 2.44 (P), and 2.10 (A). Finally, for the over $10,000 group the deviations from the grand mean were -2.33 (E), 2.66 (P), and .87 (A). Eta^2 scores, indicating the significance of these deviations, were .016 (E), .050 (P), and .021 (A), showed little significance of effect of income groups upon attitude domains. (Statistics for deviations and eta^2 values from the grand means of semantic differential domains by demographic variables are shown in Appendix D.)

Table 16

Analysis of Variance Data for Effect of Yearly Income on Evaluative, Potent, and Active Domains Regarding Attitudes Toward Physical Activity

Domain	Category	DF	Sum of Squares	Mean Squares
Evaluative				
	Income	4	73.201	18.300
	Residual	112	4613.277	41.190
	Total	116	4686.479	40.401
Potent				
	Income	4	106.156	26.539
	Residual	112	2022.169	18.055
	Total	116	2128.325	18.348
Active				
	Income	4	62.594	15.649
	Residual	112	2849.731	25.444
	Total	116	2912.325	25.106

F-ratio obtained (Evaluative) - 0.444
F-ratio obtained (Potent) - 1.470
F-ratio obtained (Active) - 0.615

F-ratio required for .05 level of significance - 2.46

CHAPTER V

SUMMARY

The Study

The purpose of this study was to determine whether or not various demographic characteristics significantly affected the attitudes of senior citizens toward physical activity. The specific hypotheses tested were for significance of effect of sex, age, educational attainment, occupational status, and income level upon attitude toward physical activity.

This was achieved through the administration of a demographic questionnaire and an attitude survey, in the form of a semantic differential. The test was administered to 227 senior citizens in eighteen senior citizen centers throughout the state of Montana. Due to the failure by some to respond fully, the net total of responses was reduced to 180.

Demographic variables included for analysis were: sex, age, education, occupational status, and yearly income. A total of twenty bipolar adjective word pairs were used in the semantic differential. Initial mean score observation of the total word pair test for the total test group indicated a markedly negative attitude, with fifteen of twenty word pair means to the negative side of neutral. The data were then subjected to an analysis of variance to determine whether or not attitude toward physical activity was significantly affected by the

demographic differences. The twenty word pairs were then divided into three domains according to criteria established by Osgood (41): evaluative, potent, and active. They were then subjected to another analysis of variance to determine whether the semantic domains were significantly affected by the demographic variables. Therefore analysis was achieved through an analysis of variance for the total group of test words, and then by each of the three semantic domains, by each of the demographic variables. In addition, a multiple classification analysis (MCA) was utilized to investigate any tendencies or trends within the demographic variables toward physical activity. A total of twenty tests for analysis of variance were performed

Results

Of the five tests conducted on the entire word pair test, it was found that sex and age were significant at the .05 level as predictors of attitude toward physical activity. Therefore the null hypotheses of no significant effect, of sex, and age, upon attitude toward physical activity was rejected. F ratios for educational attainment, occupational status, and income levels were all below the level of significance. Therefore the null hypotheses of no significant effects of education, occupational status, and income were not rejected. When broken down into the individual semantic domains all but two tests, the potent domain for sex and the active domain for age, exceeded a .05 level of significance. These suggest that in judging physical activity in the potent domain, the sex of the respondent significantly effected responses to words with "strong-weak" values. When judged in the active domain,

the age of the respondent was significant in "fast-slow" value judgments. These two had enough influence upon the composite test scores to establish a significant F ratio for sex and age for the total test score analysis.

MCA deviation scores showed a tendency among males to have more positive attitudes. Advancing age seemed to indicate a deterioration of positive attitude scores. Education and occupation deviations showed a more positive attitude among college graduates and among the still employed. Income showed a grouping of relatively more positive scores among the middle income groups.

Discussion of Results

While this study has shown that sex and age were significant in predicting attitude toward physical activity, it is equally important to note the results of profile analysis of mean scores for the group as a whole. Of a total of twenty adjective word pairs within the semantic differential, mean responses were to the negative side of neutral for fifteen pairs and to the positive side only five times. This would indicate a markedly negative attitude, taken as a whole, toward physical activity. A summary profile of the test population indicated the test group to be predominantly female (75%), over 65 years of age (70%), and have a high school education or less. In addition nearly 90% were retired with 65% having yearly incomes of less than $3,000. Obviously nothing can be done about the sex or age of senior citizens, both of which were significant predictors of attitude toward physical activity. Demographics indicated a predominance of grade and high school educated

respondents, a predominance of the retired, and a clustering at the lower end of the income scale. These are external or manipulatable characteristics, which society has the capability to control, or at least offer the opportunity for improvement. Though admittedly many of the aged retire voluntarily, many more are forced out of the work environment because of lack of education, or the lack of job opportunities directly related to their sex, age, occupation, or income needs.

Inspection of the MCA deviation scores for the demographic groups showed some highly visible and suggestive trends. Attitude was definitely more positive for the males. The younger respondents also scored more positively, suggesting that the younger members enjoy more strenuous physical activity but as age increases programming should become progressively more passive. Education levels did not show any observable pattern for deviations, but occupational status and income level patterns were evident. The still employed regarded physical activity more positively. Though this could be explained by the fact that the younger are more likely to be employed, hence more positive, it could also suggest that those whose time was occupied had more positive attitudes. And finally, income showed increasingly positive attitude toward physical activity for the income groups with increasing incomes, with the exception of the over $10,000 group. No explanation for this deviation can be given other than that the small number of individuals (4) within this group had negative attitudes. The population for this study was not an elite group. There are over twenty million aged Americans, most of whom are retired, over half of

which are women with a high school education or less, with incomes below or near the poverty level. This group will increase its population to twenty-eight million by 1990.

If attitudes are an indicator of contentment, it appears that the aged are unhappy about either their physical inability to participate in physical activity or the lack of opportunity and facilities for physical activity. Though attitudes may not precisely predict actual participation physical activity habits begin in youth and must be positively molded in order to assure the continuation of positive habits as the years accumulate.

The aged have more leisure time but less resources to enjoy it than any other age group. This is magnified by the fact that the aged in Montana are isolated both by demographics and by the relative isolation of living in a sparsely populated state. Facilities for physical and social activities are limited. This is why positive physical activity habits are vital. Participation in physical activity can be attained at either no or minimal cost, regardless of the demographics of the individual, or the geography of the area, either on an individual basis or in a group setting. Physical activity, beneficial to the physical, psychological, and social health of the aged individual, should be encouraged and supported whenever and wherever possible. For the aged are a real and silent majority and only vociferous action by American society as a whole to prepare and provide for expanded leisure time will rectify the disadvantaged role presently played by the aged.

Conclusions

Mean scores for the total word pair test for the entire test group indicated a negative attitude toward physical activity. Specific conclusions for the hypotheses under test were as follows:

1. The findings of this study failed to support the hypothesis of no significant effect of sex on attitudes toward physical activity.

2. The findings failed to support the hypothesis of no significant effect of age on attitudes toward physical activity.

3. The findings support the hypothesis of no significant effect of educational attainment on attitudes toward physical activity.

4. The findings support the hypothesis of no significant effect of occupational status on attitudes toward physical activity.

5. The findings support the hypothesis of no significant effect of yearly income on attitudes toward physical activity.

Recommendations

The following recommendations were drawn from this study.

1. Future attitude studies of the aged should attempt to reach a broader segment of the population.

2. Additional studies should test other demographic variables, such as the marital status or physical condition, for significance of effect upon attitude.

3. Further attitude investigation is necessary in order to assess the psycholgical, physical, and social needs of the aged.

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APPENDICES

APPENDIX A

SENIOR CITIZEN TEST CENTERS

Senior Citizen Test Centers

Augusta
Big Timber
Billings
Billings South
Bozeman
Circle
Ekalaka
Fairfield
Hamilton
Harlem
Harlowtown
Hysham
Jordan
Libby
Missoula
Red Lodge
Stanford

APPENDIX B

ATTITUDE SURVEY FORM

1. Name_____ 2. Address_____

3. Sex: _____Male _____Female 4. Age_____

5. Highest level of education completed:

   1st through 8th grade_____ 9th through 12th grade_____

   College_____ Graduate School_____

6. Occupational Status: _____Retired _____Employed

7. If retired, what was your occupation prior to retirement?

   _____

8. If employed, what is your present occupation?

   _____

9. If employed, how many hours per week are you employed?

   _____

10. Approximate total yearly income:

    Under $3,000 _____ $3,000-$4,999 _____

    $5,000-$7,499 _____ $7,500-$9,999 _____

    $10,000 and over _____

11. Distance you live from the nearest senior citizen center.

    Less than 1 mile _____ 1-3 miles _____

    4-10 miles _____ More than 10 miles _____

12. What types of physical and/or recreational activities have you been involved in and enjoyed throughout your life? (List)

    A._____ D._____

    B._____ E._____

    C._____ F._____

13. What physical and/or recreational activities are you currently engaged in? (List)

    A._____ D._____

    B._____ E._____

    C._____ F._____

14. What physical and/or recreational activities do you participate in currently at your local senior citizens center? (List)

    A._____ D._____

    B._____ E._____

    C._____ F._____

15. What types of physical and/or recreational activities would you personally like to see implemented at your senior citizens center? (List)

A._____ D._____

B._____ E._____

C._____ F._____

16. What recreational and/or physical activities would you be willing to lead or assist in leading? (List)

A._____

B._____

C._____

17. If the following physical or recreational activities were offered in your senor citizens group, which ones would you participate in? (Check one or more)

social dancing_____	paddleball _____	hiking _____
square dancing_____	softball _____	fishing_____
bowling _____	volleyball _____	boating_____
shuffleboard _____	bicycling _____	tennis _____
jogging _____	picnicking _____	golf _____
badminton _____	camping _____	
swimming _____	bike exercise program _____	
archery _____	fly and bait casting _____	
billiards _____	physical exercise class _____	
gardening _____	table tennis (ping pong)_____	
horseshoes _____	walking for pleasure _____	

18. How do you spend the majority of your spare time when not engaged in work or attending the senior citizens center? (Please check the activities and list the number of hours you spend on these activities per day. Please take your time in answering this question.)

		Hours spent per day
A. Socializing with friends	_____	_____
B. Recreational activities (alone)	_____	_____
C. Recreational activities (with friends)	_____	_____
D. Chores	_____	_____
E. Doing nothing	_____	_____
F. Other (list) _____	_____	_____
G. Other (list) _____	_____	_____

Directions:

The purpose of this survey is to measure the meaning of a specific concept by having various people judge the concept on a series of descriptive scales. (In this study we are interested in the meaning you attach to the concept of physical activity.) Please make your judgements on the basis of what the term physical activity means to you. There are no "right" or "wrong" answers. Do not worry or puzzle over individual items. What is wanted is your first impressions or immediate responses. Be sure to make only one check mark for each pair of words. Do not skip any pair of words. Please do not be careless because we want your true impressions.

Here is how you are to rate the concept on a 7 point scale:

If you feel that the concept at the top of the page is very closely related to one end of the scale, you should place your check mark as follows:

sweet / X / / / / / / sour

sweet / / / / or / / / X / sour

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

sweet / / X / / / / / sour

sweet / / / / or / / X / / sour

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

sweet / / / X / / / / sour

sweet / / / / / X / / / sour

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the concept you are judging.

If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely irrelevant, unrelated to the concept, then you should place your check mark in the middle space.

sweet / / / / X / / / / sour

IMPORTANT:
(1) Place your check marks (X) in the middle of the spaces, not on the boundaries.
(2) Be sure you check every scale--do not omit any.
(3) Never put more than one check mark on a single scale.
(4) Make each item a separate and independent judgement.

PHYSICAL ACTIVITY

worthless	/ / / / / / /	valuable
meaningful	/ / / / / / /	meaningless
pleasurable	/ / / / / / /	painful
difficult	/ / / / / / /	easy
weak	/ / / / / / /	strong
interesting	/ / / / / / /	boring
delicate	/ / / / / / /	rugged
humane	/ / / / / / /	inhumane
feminine	/ / / / / / /	masculine
passive	/ / / / / / /	active
reputable	/ / / / / / /	disreputable
graceful	/ / / / / / /	awkward
safe	/ / / / / / /	dangerous
responsible	/ / / / / / /	irresponsible
intelligent	/ / / / / / /	unintelligent
slow	/ / / / / / /	fast
tough	/ / / / / / /	fragile
unemotional	/ / / / / / /	emotional
healthy	/ / / / / / /	sick
wise	/ / / / / / /	foolish

APPENDIX C

ETA^2 SCORES AND DEVIATIONS FROM GRAND MEANS FOR THE TOTAL SEMANTIC SCALE BY DEMOGRAPHIC VARIABLE CATEGORIES

Eta^2 Scores and Deviations from Grand Means for the Total Semantic Scale by Demographic Variable Categories

Category	Grand Mean	Deviation	eta^2
Sex	59.20		
Male		4.02	
Female		-1.39	
			.050
Age	59.63		
> 60		6.30	
60-65		1.71	
< 65		-1.34	
			.052
Education	59.18		
1-8 Grade		0.26	
9-12 Grade		-1.21	
College		2.23	
Graduate School		-0.36	
			.015
Occupation	59.14		
Retired		-0.54	
Employed		3.96	
			.019
Income	59.04		
> $3,000		-1.10	
3,000-4,999		0.29	
5,000-7,499		3.76	
7,500-9,999		6.51	
< 10,000		-0.54	
			.039

APPENDIX D

ETA^2 SCORES AND DEVIATIONS FROM GRAND MEANS OF SEMANTIC DIFFERENTIAL DOMAINS BY DEMOGRAPHIC VARIABLE CATEGORIES

Eta^2 Scores and Deviations from Grand Means of Semantic Differential Domains by Demographic Categories

Category	Grand Mean Evaluative	Deviation Evaluative	eta^2	Grand Mean Potent	Deviation Potent	eta^2	Grand Mean Active	Deviation Active	eta^2
Sex	26.32			14.73			18.16		
Male		0.91			2.39			0.73	
Female		-0.31	.007		-0.83	.124		-0.25	.009
Age	26.37			14.89			18.37		
> 60		1.96			0.65			3.69	
60-65		1.16			0.49			0.06	
< 65		-0.60	.021		-0.23	.008		-0.52	.072
Education	26.23			14.70			18.24		
1-8 Grade		0.92			0.30			-0.95	
9-12 Grade		-1.23			-0.54			0.57	
College		1.45			0.52			0.26	
Graduate School		-1.05	.035		0.39	.013		0.30	.021
Occupation	26.37			14.71			18.06		
Retired		-0.35			0.02			-0.21	
Employed		2.58	.021		-0.16	.000		1.54	.015
Income	26.58			14.34			18.12		
> $3,000		-0.21			-0.50			-0.39	
3,000-4,999		-0.04			-0.01			0.34	
5,000-7,499		1.62			1.06			1.08	
7,500-9,999		1.97			2.44			2.10	
< 10,000		-2.33	.016		2.66	.050		-0.87	.021