THE ASSOCIATION BETWEEN SELECTED HEALTH CHARACTERISTICS
AND PARTICIPATION IN LEARNING PROJECTS

BY RETIRED EDUCATORS

DISSERTATION

Presented to the Graduate Council of the
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by

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This study identified the number of learning projects undertaken by thirty-eight retired educators and examined the extent to which these experiences were associated with the body weight and the exercise patterns of the subjects. A list of 1091 names of retired educators was obtained and 400 names were randomly selected to receive a brief survey seeking responses to demographic, personal and miscellaneous questions relating to their efforts to continue to pursue learning.

Interviews were arranged with thirty-eight subjects who met established criteria. The 1983 Metropolitan Height and Weight Tables were used to estimate weight characteristics and a probe sheet was designed to identify the number of hours spent exercising in activities vigorous enough to increase heart beat. Indepth interviews were conducted by the investigator using the questions from Tough's Interview Schedule for Studying Some Basic Characteristics of Learning Projects, and the probe sheet designed by the investigator. The interviews focused on the efforts to continue
learning during the past twelve months and on the participation in vigorous exercise during the past twelve months.

Findings were analyzed by computing t-tests for independent means and the Pearson product moment method of correlation. Comparisons of the results from this study were made with the results from two previous studies, "The Older Adult and Learning," by Roger Hiemstra, and "A Comparative Study of Professionally Related Learning Projects of Secondary School Teachers," by N. E. Kelly.

The results of this study indicate that much learning is continued past retirement and that all learning is not focused on self; some relate to the needs of the community and of churches. The data supports Hiemstra's premise that health related obstacles diminish learning activity. The Theory that older adults pursue less learning than young adults was not supported by this study.
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

### Chapter

1. **INTRODUCTION**
   - Statement of Problem
   - Purposes of the Study
   - Hypotheses
   - Significance of the Study
   - Definition of Terms
   - Delimitations
   - Instrument
   - Procedures for Collection of Data
   - Procedures for Analysis of Data

2. **SURVEY OF RELATED LITERATURE**
   - Adult Participation in Traditional Education
   - Adult Participation in Non-Traditional Education
   - Older Adults and Learning
   - Older Adults and Fitness

3. **PROCEDURES OF THE STUDY**
   - Population and Sample Selection
   - Human Consent Form
   - The Interview Instrument
   - Interview Procedure
   - Analysis of the Data

4. **PRESENTATION AND ANALYSIS OF DATA**
   - Statement of Purpose
   - The Sample
   - Findings

5. **SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**
   - Summary of the Study
   - Summary of the Findings
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conclusions</td>
<td></td>
</tr>
<tr>
<td>Implications</td>
<td></td>
</tr>
<tr>
<td>Recommendations</td>
<td></td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>119</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>123</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>135</td>
</tr>
<tr>
<td>APPENDIX D</td>
<td>140</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>142</td>
</tr>
</tbody>
</table>
### LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Hiemstra's Table 22. A Comparison of Summary Research Studies on Learning Projects</td>
<td>43</td>
</tr>
<tr>
<td>II. Level of Education of Retired Educators</td>
<td>87</td>
</tr>
<tr>
<td>III. Education Beyond Bachelor's Degree</td>
<td>88</td>
</tr>
<tr>
<td>IV. Career Assignment</td>
<td>89</td>
</tr>
<tr>
<td>V. Weight Differences of Retired Teachers and Number of Learning Projects Initiated Within One Year</td>
<td>90</td>
</tr>
<tr>
<td>VI. Difference Between the Mean Score of Number of Learning Projects by Average Weight Group and the Mean Score of Number of Learning Projects by Overweight Group</td>
<td>91</td>
</tr>
<tr>
<td>VII. Difference Between the Mean Score of Reported Number of Hours Spent Learning by Average Weight Group and the Mean Score of Reported Number of Hours Spent Learning by Overweight Group</td>
<td>92</td>
</tr>
<tr>
<td>VIII. Participation In Routine Activities Requiring Exercise and Expenditure of Physical Energy</td>
<td>94</td>
</tr>
<tr>
<td>IX. Total Number of Hours Spent Per Week for Conditioning With the Hours Spent in Physical Activity</td>
<td>95</td>
</tr>
<tr>
<td>X. Relationship Associated with Number of Learning Projects Initiated in One Year and Number of Hours Spent Exercising for Physical Conditioning</td>
<td>97</td>
</tr>
<tr>
<td>XI. Total Number of Hours Spent Exercising by Age Sex, Race and Weight Classification</td>
<td>98</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>XII. Difference Between the Mean Score of Number of Learning Projects by Hiemstra's Sample with the Mean Score for the Number of Learning Projects by Simmons' Sample</td>
<td>99</td>
</tr>
<tr>
<td>XIII. Difference Between the Mean Score of Reported Number of Hours Spent Learning by Hiemstra's Sample and the Mean Score for Reported Number of Hours Spent Learning by Simmons' Sample</td>
<td>100</td>
</tr>
<tr>
<td>XIV. Comparison of Secondary Teachers with Retired Teachers for Demographic Characteristics</td>
<td>101</td>
</tr>
<tr>
<td>XV. Comparison of Secondary Teachers with Retired Teachers for Educational Achievement</td>
<td>102</td>
</tr>
<tr>
<td>XVI. Difference Between the Mean Score for the Number of Learning Projects by Secondary School Teachers and the Mean Score for the Number of Learning Projects by Retired Teachers</td>
<td>103</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Many agencies and institutions operating in our communities have as a primary purpose the responsibility of assisting retired persons in learning skills for productive living. Such agencies include schools and universities, churches, municipalities, libraries, YMCA's, YWCA's and other non-profit organizations. A study of the learning projects of retired educators should provide a better understanding of suitable learning experiences for all retired people.

Learning projects designed by individuals outside formal teaching situations have been studied in depth (20). Populations studied have included ministers, housewives, elementary school teachers, pharmacists, physical education and health teachers, and engineers (1, 4, 7, 11, 16, 18). No prior study has been found about retired educators with respect to learning projects.

This research is based on the early work of Allen Tough (20) and the later work of Roger Hiemstra (10). Tough defined a learning project to be a "...highly deliberate effort to gain and retain certain definite knowledge and skill, or to change in some other way" (21, p. 250). Tough
arbitrarily set seven hours as the minimum length considered for a learning project since this approximates a day's work; devoting that much time and effort within a six-month period represents serious individual intent to learn (20). No maximum length has been established for learning projects and Tough, referring to studies conducted between 1971-1978, maintained that "...a typical learning effort requires 100 hours. And the typical adult conducts five of them a year: 500 hours altogether" (21, p. 250).

Hiemstra (10) studied 256 older adults and reported the average number of learning projects was 3.3 and the average number of hours spent in learning was 325. He concluded that lack of energy and stamina and health problems were major deterrents to learning. Regarding health problems such as lack of energy and stamina, McArdle, Katch and Katch (15) have linked sedentary living patterns and body composition to be factors influencing fatigue. In the introduction to Guide to Fitness After Fifty, Conrad announced, "A scientific and social breakthrough of great significance is the recognition that many problems historically attributed to aging are really the products of neglect, abuses and lack of fitness" (3, p. x). From the same source, Harris alleged that "...changes in physical capacity are not inevitably a result of aging, but rather a result of physical disuse and inactivity which exercise and training can improve" (8, p. 4).
Considerable knowledge is available concerning learning projects undertaken by adults. This study sought specifically to compare an older population to existing research and to explore body weight and exercise patterns as possible barriers to learning among older adults.

Statement of Problem

This investigation was concerned with (1) the number of learning projects undertaken by retired educators, and (2) the extent to which these experiences were associated with the body weight and the exercise patterns of the subjects.

Purposes of the Study

The purposes of this study were to determine the following:

1. The number of learning projects undertaken by retired educators during one year;
2. The number of hours spent by retired educators learning during one year;
3. The relationship between body weight and participation in learning projects;
4. The relationship between exercise practices and participation in learning projects; and,
5. The relationship between the results of this study and the results of previous studies.
Hypotheses

To carry out the purposes of the study, the research hypotheses were as follows.

1. The mean number of reported learning projects initiated in one year among average weight subjects will be higher than the mean number of learning projects initiated in one year among overweight subjects. Overweight is a barrier to health. Research has indicated that health-related obstacles diminish learning activity (10).

2. The mean number of reported hours spent in learning projects in one year by average weight subjects will be higher than the mean number of reported hours spent in learning projects in one year by overweight subjects. Overweight is a barrier to health. Research has indicated health related obstacles diminish learning activity (10).

3. There will be a positive relationship between the number of hours spent in learning projects per year and the number of minutes spent in physical activity per week. Research indicates fatigue and lack of vigor to be barriers to participation in learning projects (10). Research indicates amount and frequency of exercise affects fatigue level and physical endurance (15).

4. The mean number of the reported learning projects initiated by retired educators within one year will be higher than the mean number of reported learning projects initiated within one year by Hiemstra's older adults. Research has
shown that amount of formal education influences the amount of participation in learning projects (5, 12, 17). Teachers must have a college degree. Less than 20 per cent of the subjects in the study conducted by Hiemstra had a college degree (10).

5. The mean number of reported hours spent by retired educators in learning projects within one year will be higher than the mean number of reported hours spent in learning projects within one year by Hiemstra's older adults. Research has shown that amount of formal education influences the amount of participation in learning projects (5, 12, 17). Teachers must have a college degree. Less than 20 per cent of the subjects in the study conducted by Hiemstra had a college degree (10).

6. The mean number of reported learning projects initiated in one year among retired teachers will be lower than the mean number of reported learning projects initiated in one year among Kelly's (13) secondary school teachers. There is some confusion in the literature. Some studies (12, 17) indicate that younger adults are more likely to participate in learning than are older adults. Kelly (13) reported no significant difference in number of learning projects initiated in one year between two groups of secondary school teachers (mean age: 26 and 38). Research find-
ings are inconclusive regarding the association of age with learning.

**Significance of the Study**

It is in the interest of every individual in the United States to become knowledgeable about human potential and to form realistic expectations for living a productive existence throughout life, including the last years. According to recommendations made during the White House Conference on Aging,

It is the considered opinion of the Committee on Education that education is not only an inherent right of all age groups, it is a necessity for a society struggling to achieve a fuller measure of social justice for all Americans irrespective of age, race, sex, economic status, color, territorial residence, handicap, or national origin (23, p. 154).

Professional health educators and physical educators are showing increased interest in providing programs for the needs of older adults. According to a 1982 National Survey of Adult Programs in Physical Education by researchers from the University of Oregon, the following was reported:

As physical educators and professionals concerned with human development, it is reasonable and imperative that we include the adult population as we study human behavior and growth characteristics. In the future, we can expect the methodological, theoretical, and research components of many professional programs to give equal attention to the adult population as has been given traditionally to early childhood and adolescent sectors (2, p. 4).
This study is significant in that it may accomplish the following:

1. Extend the knowledge concerning the learning projects of older adults;

2. Explore the association between weight and exercise and the amount of learning projects undertaken by retired educators; and,

3. Further the theoretical knowledge of the number of learning projects undertaken by older people.

Previous studies have reported the extent of continuing education by employed individuals and have examined the influence these learning projects have had on job skills and other aspects of their lives. This study proposed to focus upon the extent of the continuing education of retired educators and the association between body weight, exercise practices and learning.

Definition of Terms

The following terms are defined for use in this study.

1. Adult is any person who has reached the maturity level where he or she has assumed responsibility for himself or herself and sometimes others and who has assumed a productive role in the community (22, p. 29).

2. Adult Education is defined as "...any planned learning activity engaged in by and for anyone who possesses
the biological, civil and cultural characteristics of an adult" (14, p. 4).

3. **Body weight** is the number in pounds reported by the subject to the best of his/her knowledge.

4. **Exercise** refers to participation in activity vigorous enough to increase the heart beat.

5. **Frame size** refers to the approximated size of the bone structure based on the person's height in one inch heels and the measurement taken of the breadth of the elbow. Frame size is designated as small, medium or large by the 1983 Metropolitan Height and Weight Tables (9).

6. **Learning** refers to all changes in behavior within the cognitive, psychomotor and/or affective domains.

7. **Learning project** is defined as "...a series of related episodes, adding up to at least seven hours. In each episode, more than half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself" (20, p. 7).

8. **Overweight** refers to the body weight which is greater than the range of weight recommended for the corresponding frame size published in the 1983 Metropolitan Height and Weight Tables (9).

9. **Physically active** refers to the practice of exercising three or more times per week with each session
lasting thirty minutes or more, or the equivalent of one and one-half hours of exercise per week (90 minutes).

10. Program is defined as an activity which is planned and organized with specific objectives (10, p. 10).

11. Retired educator refers to an individual who has devoted twenty or more years to a career in education and who has terminated his/her service as a full time salaried educator.

12. Sedentary refers to individuals who participate in less than one and one-half hours (90 minutes) of exercise per week.

Delimitations

This study is subject to the following delimitations in generalizing from the data.

1. The population was limited to retired teachers from a forty mile radius of Arlington, Texas.

2. The study was for a particular year which may or may not be typical of years during which retired teachers undertake learning projects.

Instrument

The Interview Schedule for Studying Some Basic Characteristics of Learning Projects constructed by Tough and associates (21) and the additional segments to use with older adults designed by Hiemstra (10) were administered in
this study. Numerous investigators have used this interview schedule since Tough produced a final version in 1975.

The efforts made by Hiemstra to insure reliability of the interview schedule included

1. Conducting extensive training sessions for all eight interviewers;

2. Pilot-testing the initial draft of the schedule with four older adults, ages 57, 60, 68, and 81 (included questions which had received unanimous agreement from three adult education/gerontology experts);

3. Refining the final draft;

4. Reviewing the consistency of each interviewer by a research assistant; and

5. Telephoning various respondents one month after the interview to follow-up and to check for differences in responses to questions.

Hiemstra (10) made efforts to insure a valid instrument by reviewing previous research using this instrument. All additional questions were examined by a panel of judges and evaluated for "...ambiguity, clarity, wording, and sequence" (10, p. 28). Only the questions receiving unanimous agreement were included in the study. Further appraisal was made through a pilot study.
Procedures for Collection of Data

The Population

The subjects for this study were selected from the group of retired educators residing within a forty mile radius of Arlington, Texas, and having the following qualifications:

1. Must be within the fifty-five to seventy-one year age range at the time of the interview;
2. Must have served as a salaried educator in a public, and/or private school, college or university for twenty years or more;
3. Must have been retired from full-time duties less than five years; and,
4. Must be willing to participate in a personal interview which will last approximately two hours.

Selection of the Sample

Permission to use the names of retired teachers was obtained from the following: public schools and universities willing to provide a list of retired educators, directories of retired educators from large school systems, and names provided from the Retired Teacher Association of Texas. A master list of the names and addresses of individuals located within forty miles of Arlington, Texas, was compiled.
Using a table of random numbers, 400 names were selected to receive a preliminary survey. The survey was mailed to potential subjects along with a stamped, addressed envelope for returning the survey form.

The individuals selected for the study were chosen by design from the returned forms, and twenty-five overweight and thirteen average weight subjects meeting the established criteria were interviewed. Since the proportion of overweight respondents was much greater than the average weight respondents, the number in each group was not equal. (Thirty was considered to be an adequate number of subjects, but thirty-eight were selected to allow for drop-outs or incomplete interviews. There were no drop-outs.)

Research Design

This study was designed to determine if body weight and amount of exercise were associated with the number of learning projects initiated within one year by retired educators. The criterion measures were the answers given by the subjects through in-depth personal interviews. Rather than create the treatment, the researcher examined the association between physical characteristics (body weight), exercise practices and learning behavior (the amount of learning projects initiated within the previous twelve months).
The interview schedule was similar to the schedule designed for use with older adults by Hiemstra (10) in his study "The Older Adult and Learning." (A copy of the revised Interview Schedule is included in Appendix B.)

An additional section of questions was composed for the purpose of determining the number of minutes per week spent in physical activity. This included walking, swimming, dancing, stair climbing, bicycling, jogging, sports and any work vigorous enough to classify as exercise. These questions and a reminder list were submitted to a panel of experts for evaluation. The panel included three individuals—(1) an exercise physiologist with experience working with older adults, (2) a person with experience administering the Interview Schedule for Studying Some Basic Characteristics of Learning Projects, and (3) a professional educator experienced in gerontology. The questions receiving unanimous approval by the panel were compiled for use with a pilot study. Further refining of the questions and the reminder list followed the pilot study. (See Appendix B for a copy of the reminder list.)

A pilot study was conducted using four retired educators (as recommended by Hiemstra, Personal communication, June 8, 1983). Changes in the procedure were made following the pilot study.
Each prospective subject was contacted individually and told the purpose of the study and assured of confidentiality. All volunteers were to be interviewed using the Interview Schedule developed by Tough (20) and later refined for use with older adults by Hiemstra (10). The Interview Schedule consisted of a series of open-ended questions which probed the memory of the subject concerning learning efforts initiated during the preceding twelve months. Tough and Hiemstra both granted written approval for this instrument to be used in this study. (A. Tough, personal communication, June 18, 1983; R. P. Hiemstra, personal communication, June 8, 1983.)

The 1983 Metropolitan Height and Weight Tables (9), published by the Metropolitan Life Insurance Company, Health and Safety Education Division was used for determining overweight and average weight categories. Individuals who classified as underweight by the 1983 Metropolitan Height and Weight Tables were not included. The amount of exercise was recorded according to the reported number of hours engaged in exercise weekly. The Interview Schedule for Studying Some Basic Characteristics of Learning Projects (20) was used to measure educational participation.

Procedures for Analysis of Data

After conducting the interviews, the data were prepared for processing using the Statistical Analysis System (SAS).
Testing of Hypotheses

Hypotheses one, two, four, five, and six were tested in the null form utilizing the t-test for a difference between two independent means for a one-tail test. The null hypotheses were rejected at the .05 level of significance.

Hypothesis three was tested by the utilization of the Pearson product moment coefficient of correlation. Formulation of conclusions and recommendations were consistent with the data.

Organization of the Study

The problem, the significance of the problem, definitions, and delimitations are in Chapter I. A review of related literature is presented in Chapter II. Chapter III describes the population and the sample selection, the interview instrument, and the procedure used to collect the data. Analysis of the results is presented in Chapter IV. A summary of the study and conclusions, together with implications and recommendations for further research are presented in Chapter V.
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CHAPTER II

SURVEY OF RELATED LITERATURE

Overview

This study limits the literature review on adult learning to four areas, adult participation in traditional education, adult participation in non-traditional education, older adults and learning, and older adults and physical fitness. The survey of literature focuses on the physical, mental and social influences on the continuing education of adults beyond age fifty-five.

Adult Participation in Traditional Education

As early as 1961 studies were conducted investigating the patterns of learning behavior within formal or structured courses of study developed by agencies, institutions and churches. The people who were studied were grouped according to their behavior, those who enrolled in adult education courses were classified as participants and those who did not were classified as non-participants (55). One of the original studies was conducted by Houle (52) who investigated the men and women who retained "...inquiring minds through the years of their maturity" (52, p. x).

Houle conducted case studies on twenty-two adults who had been classified as persons who were active participants
in organized programs of continuing education. Houle observed that some people possess more incentive to learn than others, and that adults who deliberately seek learning activities could be categorized into three types of learners. These categories were described as (1) those who seek clearly defined objectives or the goal-oriented; (2) those whose involvement in the learning process reaps meaning, or the activity-oriented; and (3) those who seek to satisfy a curiosity about knowledge, or the learning oriented. Even though the three categories may overlap they have identifiable characteristics. According to Houle the aims of education should include experiences for every type of adult learning.

Houle described adulthood as offering "...to the average individual fifty years in which to learn how to solve his own problems as well as to explore the wonderfully inexhaustible realms of knowledge" (52, p. 30). He observed superiority when compared to youth for benefiting from adult learning, and stated, "The man or woman is far more able than the youth to know, to understand, to explore, to appreciate, discern subtle relationships, to judge, and to look behind the surface of things to their deeper meaning" (52, p. 30). Houle suggested that some adults seeking knowledge in the American culture experience a negative reinforcement from close associates and family members.
Influences which lead to habits of lifetime learning were reported by Houle to be, "...family background, teachers and schools, public libraries, occupation and the example of friends" (52, p. 68). He suggested that formal education has strong influence on lifelong learning behavior due to the development of fundamental skills and a sensitivity to the changing nature of life (52).

An additional study by Sheffield (93) and Ingham (54) supported Houle's research and expanded his types of learners. Sheffield suggested dividing goal-oriented type into personal goal-oriented and societal goal-oriented. Ingham suggested adding a leisure satisfaction-oriented category. These studies investigated behavior of the learner participating in formal or traditional learning programs.

Johnstone and Rivera (55) conducted a study on adult/continuing education which surveyed the educational activities of approximately 12,000 American households. Intensive study of the effects of continuing education on adult behavior was based on personal interviews with approximately 1800 randomly selected adults, plus 1000 recent adult education participants. They defined an adult as "...anyone twenty-one and over; married; or head of a household" (55, p. 31). Adult learning was interpreted to include (1) activity in which the main purpose was to acquire
knowledge, information or skill, (2) the activity which was organized around some form of planned instruction, and (3) self-instruction when it was organized and planned.

When adults under thirty-five were compared with those over thirty-five Johnstone and Rivera found more participation by the younger group. In reflection they theorized that level of education was a major factor in the amount of participation by older adults. They predicted that by 1982 sixty-nine percent of adults would have attended college and due to that increase in level of education, adults between the ages of 50-60 would engage in more learning activities. According to Johnstone and Rivera

In any event, what is of particular significance in these results is the general finding that the influence of the aging process on interest in learning may be noticeably affected by general psychological outlook. When optimism about life and readiness to change fade, then so too does desire to learn (55, p. 90).

Their findings revealed a sex-linked difference in attitudes toward learning between young and old: men younger than thirty-five participated in more learning than women and this educational behavior reversed for men and women over fifty-five years of age. They explained that this finding might indicate that "...educational behavior may be strongly influenced by life-cycle position" (55, p. 90).

They summarized their study by stating that "...one person in five had been active in one or another form of
learning during the twelve month period prior to June 1962" (55, p. 3). Out of 25 million adults active in some form of education during 1961-1962 approximately 17 million enrolled in a formal course and 9 million participated in some form of non-traditional education. Johnstone and Rivera suggested that the discovery of such large participation in non-traditional education represented one of the most neglected areas of research in adult education. Since the publication of their results, much interest has been generated concerning the nature of independent and self-directed study during adulthood (10, 19, 37, 49, 58, 72, 73, 84, 85, 96, 101, 103, 106).

In 1965 Tough began a study examining the Teaching Tasks Performed by Adult Self-Teachers followed in 1968 by a study on Why Adults Learn. Both studies focused on a broad definition of learning which included deliberate learning behavior applied to any learning experience including non-traditional or unstructured learning.

Adult Participation in Non-Traditional Education

In 1969 Shorey (96) conducted a study investigating the continuing education of teachers. Data were collected through questionnaires and results appeared to support the concept that informal (or non-traditional) education was as significant to individual growth as were formal (or traditional) educational activities. Shorey defined formal
education to be: "...those activities, usually sponsored by an organization or institution which normally takes place in a structured setting for which there is usually a fixed syllabus or agenda" (96, p. 34). Informal activities were reported to mean "...those activities which take place outside an institutionally structured setting. These include such personal activities as reading, self-directed study, et cetera" (96, p. 34). Conclusions of Shorey's dissertation reported the following:

So far as formal planning of activities designed to stimulate teacher growth and development are concerned, the findings of the study suggest that more attention should be paid to the growth of the teacher as an individual. For example, it was found that personal growth appeared to be most readily facilitated by activities in which the individual could to the greatest extent direct his own learning activities (96).

Shorey's dissertation was conducted through the University of Toronto, and his graduate committee included Allen Tough and J. R. Kidd who were the inspiration for prolonged interest in the value of non-traditional learning.

Prolific descriptive research concerning self-directed learning was generated by Allen Tough at the Ontario Institute for Studies in Education. Sixty-six people representing seven different populations were interviewed during 1970 and through this work, a probing, in depth interviewing technique was developed and refined (101). The term learning project was defined as: "...a series of related episodes, adding up to at least seven hours. In each
episode, more than one-half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself" (101, p. 7). The interview questions aided the recall of the actual learning projects initiated within the previous twelve months. Investigators were trained to administer the interview schedule and thereby assist the subject in estimating the number of hours spent in each project and in recalling information concerning what subjects were pursued, what resources were used and what factors were considered obstacles to learning.

Tough reported that initially many of the individuals were uncertain as to whether they understood the meaning of learning projects and many considered the type of learning that interested them not likely to be regarded important by society. After discussion with the interviewer clarity of the meaning of learning projects was established. When the results were tabulated all but one individual had initiated one or more learning projects during the past twelve months. The number of learning projects ranged from 0-20 and the mean was 8.3. The total number of hours spent learning ranged from 0-2509, and the mean was 816 hours (101). The seven populations represented by the sixty-six individuals were: professors, politicians, lower-white-collar men, factory workers, lower-white-collar women, teachers, and
mothers having at least one pre-schooler. The group having the highest number of learning projects was the professors and the group having the lowest number of learning projects was the mothers. (The number in both groups was ten.)

According to Tough, factors influencing how a person initiates learning were, the past experience with learning, the personality of the individual, the environment such as certain characteristics of friends, family, community and society. He observed that competence in self-directed learning required an understanding of principles of learning and behavior change (101, 102, 105). Tough agreed with the conclusion made by Johnstone and Rivera concerning the importance of earning credit for educational efforts. Tough observed that the actual number of adults taking credit courses was large but the percent was low (101).

Several graduate students involved with the 1970 study conducted their own study investigating the learning behavior of adults in which the learning schedule developed by Tough was administered for the purpose of gathering data. Fair (37) and McCatty (73) were two of Tough's original assistants and both selected public school teachers for their investigation.

Fair (37) investigated the professional learning projects of thirty-five randomly selected first year elementary school teachers. (The requirement of having a bachelor's degree was not enforced and approximately 65
percent of the total population had not earned a university degree.) A probe sheet designed to represent likely learning projects needed by teachers was developed for use with this population and added to the Tough interview schedule.

The findings from Fair's research revealed an average of 8.8 professional learning projects during the 26 weeks (the range was 5-14). The average number of hours spent learning during this period of time was 500 hours, which represented close to twenty hours a week for these first year teachers. In the dissertation Fair recommended that teacher education courses should develop skills in self-directed learning.

McCatty (73) pursued similar research concerning non-traditional education. In 1973 she studied *Patterns of Learning Projects Among Professional Men* and in 1976 in another study she examined the continued learning engaged in by forty-two physical and health educators. This study was supported by an Ontario Educational Council grant. Both of her studies utilized the interview schedule refined by Tough (101). McCatty's conclusions agreed with Fair as she also recommended that undergraduate teacher preparation should prepare students with strategies for self-directed learning. (Twenty-nine of the physical and health teachers participated in self-planned physical fitness programs and
none used a group designed program.) Only three percent of
the learning projects were through credit courses. McCatty
reported the average physical and health education teacher
devoted twenty hours a week to learning projects and the
majority of learning projects were self-planned (72).

A study at Cornell University conducted in 1976
utilized Tough's interview schedule to compare the pro-
fessionally related projects of secondary school teachers.
Kelly (58) examined two groups of secondary teachers,
twenty teachers who had taught one or two years (average age
was 26), and twenty teachers who had taught ten to fifteen
years (average age was 38). Like Fair (37), she investi-
gated only the learning effort designed to influence
the professional needs of the teachers. Kelly specifically
compared the number of learning projects of the younger
teachers with the number of learning projects of the older
teachers. Unlike Fair's population, all of the teachers
had a bachelor's degree and fourteen had completed a
master's degree. The range of learning projects for the
less experienced and younger group was 4-15 and the mean was
8.3. The more experienced and older group had a range of
2-17 number of learning projects, mean of 7.45. The differ-
eence between the two groups in the number of projects con-
ducted was not statistically significant at the .05 level
(t=.83, df=38, p=.414). Johnstone and Rivera's conclusion
that older individuals participate in fewer learning
activities than younger individuals was not supported (55). The mean age of Kelly's two groups differed significantly at less than the .001 level (58, p. 56), even though the twelve year difference in age was less than the population studied by Johnstone and Rivera. Kelly theorized that societal factors exerting pressures on teachers to update teaching expertise may have contributed to this lack of difference between the two groups of teachers. Over fifty percent of the learning projects were self-planned and twenty-five percent of the learning projects were taken for credit by the more experienced and older group. As did previous researchers, Kelly concluded that results of this study indicated the need for teacher education departments to design preservice programs for prospective teachers to develop competence in self-directed learning.

Older Adults and Learning

Theories on Aging

Research on aging has focused on illnesses and the degenerative effects of aging. Various theoretical concepts have been developed which have influenced the attitude of society and have established expectations and generalizations about the process of aging (3, 43, 59, 62, 64, 88, 92, 109). One outcome of the Kansas City Study (25) was the formulation of the disengagement theory, which explained
that disengagement from community functions by elderly is
inevitable and mutually satisfying to both society and older
people (22, 25, 51, 77). Havighurst, Neugarten and Tobin
(43) tested and expanded the findings from the Kansas City
Study through a cross-national study of steelworkers and
retired teachers (43). This work resulted in the develop-
ment of the activity theory, which "...holds that those who
age successfully are those who keep active and in touch with
the life of the community" (24, p. 245). Another theory on
the aging process is the theory of margin, developed by Howard
McClusky. The margin theory integrates vital ingredients
from both the disengagement and the activity theory on
aging. McClusky (74) proposed that older people face a
constant battle to restore a margin of energy and power to
diminishing reserves. He proposed that older people must
learn to control margin by modifying either load or power;
and learning is an essential method of coping with change
(74). This theory recognized the detrimental effects of
aging, but maximized the potential of existing, healthy
characteristics.

Established concepts concerning the process of aging
have led to a number of myths concerning being old (22, 31,
59, 68, 80, 82, 95). Basically, these myths link chrono-
logical age with senility, dependence, uselessness and poor
physical and mental health (90). There are greater differ-
ences among people over age sixty-five than among any other age category (17, 22, 42, 48, 74, 87, 91) and studies which have dealt primarily with poor health have failed to take into consideration the strengths and abilities many older people possess (25, 97). Only a small percent of the aged experience health barriers serious enough to prevent continued involvement in society (2, 17, 42, 111).

The National Institute of Mental Health conducted an eleven year study and reported that many of the psychiatric illness in the aged were no different than those experienced by the young (15, p. 33). "In general the healthy aged were characterized by flexibility, resourcefulness, and optimism, whereas manifestations of mental illness were attributed to medical illness, personality factors, and sociocultural effects rather than the aging process" (15, p. 33). The lifestyle of an individual affects the rate of physical decline and results of sedentary living have been linked with cardiovascular disease, limitations in mobility, neuromuscular deterioration, impairment of protein synthesis and obesity (2, 22, 43, 66, 92, 109).

Information about all of the possible physical and mental disabilities which may occur during aging is readily available, but very little data investigate the developmental process throughout the final years of life (3, 24, 92). In contrast to the physical and mental aspects, very little has been studied concerning the effects of growth and
development during the last decades of life due to attitudes and relationships between family members and society, and effects of financial stress (17, 95, 107). Updating knowledge and skills through continuing education have been recognized as a real need of the old, and should be an integral part of life (49, 50, 59, 86, 107). Butler (17) recommended a life-cycle education in addition to lifelong learning. He defined this as "...education in which different psychological, personal, familial, occupational and other tasks related to specific processes and stages of life are taught" (17, p. 389). How to handle disability, illness, reduced productivity, and finally death would be considered a part of the process of life.

**Physical Aspects of Aging**

Research has identified a sizable number of body functions which decline as a person ages (4, 22, 42, 94, 97, 109). Scholars have reported a gradual decline of: brain cells, bone mass, muscle size and strength, sensitivity for smell and taste, vision and hearing acuity, breathing capacity and residual lung capacity, cardiac output, maximum oxygen consumption, reaction time, reproductive hormones, renal capacity, metabolism and glucose tolerance (36, 94).

A few detrimental increases in physiological function has been cited, such as an increase in blood pressure, reaction time, and an increase in the percent of body fat
(14). All of these physiological changes have been associated with reduced productivity and efficiency (7, 8, 33, 36, 38, 43, 44, 45, 53, 64), but causes for the decline have been attributed to poor health and lifestyle rather than caused solely by the aging process.

As a person ages there is greater risk of succumbing to disease, such as cardiovascular disorders, cancer and respiratory disease. Some research reports that heredity and absence of disease were not as important predictors for increased longevity as lifestyle, self-concept and absence of a lifetime smoking habit (67, 79, 113). Effects of sedentary living have been the topic of a number of physiological studies conducted during the past twenty years (14, 23, 26, 32, 40, 42, 98, 110). This topic is discussed in detail later in this chapter under the sub-title Older Adults and Fitness.

**Mental Factors Influencing Older Adult's Learning**

The ongoing dispute over the changes of intellectual ability due to aging has raged for over half a century. Issues included reduced mental reaction time (69), differences in longitudinal studies vs cross-sectional studies (56, 60, 83, 100, 108), the effects of declining health on intelligence testing (63), and differences in educational level between young and old subjects (60, 76). Considerable attention has been given to facets of mental functions, such as crystal-
lized and fluid intelligence (5, 18, 63, 112). Even though older subjects scored lower than younger subjects on various components of intelligence tests, scores associated with crystalized intelligence were higher. Crystalized intelligence included verbal comprehension, numerical skills and inductive reasoning (5).

Comparisons of intelligence test results of elderly subjects with younger subjects have received much attention by critics (71), who have frequently questioned and raised issues concerning unreported variables (34, 76). The level of education was one major disparity between individuals of different generations. Cross summarized research contributions, as follows:

Perhaps we have learned as much as we can learn about the impact of aging on performance on intelligence tests. The discrepancies between cross-sectional and longitudinal studies are more or less resolved, with the conclusion that normal, healthy adults can expect to be efficient and effective lifelong learners well into old age. Researchers are now moving away from plotting omnibus intelligence test scores against chronological age toward looking at different kinds of cognitive functions (24, p. 161).

Older adults best learn and retain information that has meaning and is related to previously learned material (3, 11, 28, 43).

Lacking in research were studies focusing on specific variables which were representative of the behavior of older adults and offering insight on developmental aspects of adult mental growth. Labouvie-Vief (65) indicated that many
authors believe that retirement creates a social climate that can discourage productivity and can be linked to a decline in cognitive competence. She stated,

I am not aware of any research that—as in the domain of social adjustment and levels of social activity (e.g., Bengtson, 1973; Maas and Kuypers, 1974)—follows people into retirement in temporal sequence and examines their cognitive behavior as they establish their different patterns of adjustment to retirement (65, p, 242).

Variables affecting mental growth of older adults would include interpersonal relationships, social isolation, society's negative expectations, loss of self-image and work focus (7, 35, 39, 74, 92). Focus on these sociological factors has been identified as a potential topic for future study regarding the aging process.

**Sociological Factors Affecting Learning**

In America high value has been placed on productivity and work (6, 65, 80, 92). Many people experienced trauma and anxiety when mandatory retirement forced them to lose their role as a contributor to society (3, 6, 35, 36). Being able to learn new skills and to cope with change could foster growth and incentive to pursue challenging activities after retirement (3, 8, 17, 33, 35, 36, 51, 107).

Financial situations determine the freedom to use leisure for enjoyment and to explore learning projects. However, retirement reduces one's income and unless advanced planning has successfully reduced living expenses the strain
of living on Social Security payments can induce many burdens, both financial and psychological (17, 107). Owning a home, automobile and other assets can help to remove possible barriers to learning and to provide the environment conducive to learning (8, 36, 47). The higher the educational level and the more recent the participation in learning experiences the more likely adults will seek learning opportunities during their later years (24, 43, 45, 52, 66, 75, 88, 91).

The decision by older adults to participate in selected learning activities can be influenced by the value and appropriateness placed by society on such action or involvement (45). Participating in church functions provide an avenue for older adults to continue learning. Studying the Bible and religion are lifelong learning pursuits considered by society to be worthy and appropriate behavior for older adults. Contributing time and service to the community frequently require the willingness to learn additional knowledge and new skills. When older adults participate in church work and community service they receive reinforcement by their peers as well as younger members of the community. However, efforts to engage in other forms of learning may be viewed by society as a waste of time or inappropriate behavior. According to Rosow,

The crucial people in the aging problem are not the old but the younger age groups; it is the rest of us
who determine the status and position of the old person in the social order... There is no way out of this dilemma for young or old without a basic re-ordering of our national aspirations and values, of which the aging problem is but a token (88, p. 191).

According to McClusky (74) the older a person becomes the less likely he will participate in adult education.

The need to change the educational patterns of our society has been recognized by educators for many years (57, 61, 74, 104). The changes occurring during the last century (the transition from developing an industrial society and then toward becoming an electronic society) have brought obsolescence to all ages: young adult, middle age, and certainly old age (78). No longer can the preparation for a lifetime career fit into the twelve to sixteen years just prior to adulthood. According to Butler,

Continuing education should be part of life, not the prerogative of youth alone. Public school, colleges and universities should expand their responsibilities to the entire span of adult development. This is necessary to offset intellectual and skill obsolescence, to make retraining programs possible and to redesign individual skills to fit with work, just as in many instances work could be redesigned to fit the special skills of the individual (15, p. 389).

Research based on examination of all life cycle variables is needed to establish realistic understanding of the potential learning abilities of adults, especially the older adult (36, 81).

Shifts in population figures (increased percent of older citizens) will heighten society's motivation to provide continued education for older students. Eklund
strongly supported this issue when he stated,

One objective must, however, receive concerted support of all: older adults must be served through education by whatever philosophy or method. Old people deserve it; society needs it. Old people's ever increasing numbers and days represent a growing resource whose potential is too precious to neglect; and conversely, whose neglect is too great a social and economic loss to countenance. (36, p. 350).

Hiemstra and many others have begun to conduct this type of research.

**Continuing Education of Older Adults**

Roger Hiemstra conducted extensive research on education and older adults (47, 49, 50). He sought to identify the educational needs and interests of older people. One study surveyed eighty-six retired persons living in residential centers for the aged or participating in senior citizen centers (47). Thirty-seven of this group were retired teachers and had received college degrees. Nine members of the population had less than a high school diploma. The average age of the men was 71.4 and of the women was 70.4. A three part questionnaire was distributed to volunteers from two non-residential senior citizen centers and two residential centers. Section A elicited responses to gather demographic data; section B obtained information about past participation in continuing education activities; and, section C obtained information about the kinds of learning activities the subjects perceived they
would like to have. There were fifteen men volunteers and seventy-one women volunteers.

Hiemstra divided learning experiences into two categories: instrumental learning experiences and expressive learning experiences. Instrumental included all activities which were designed to develop competence in "...effective mastery of old age challenges," such as meeting the changing demands of retirement, financial, medical care, improving skill in reading, writing and mathematics, and, understanding the aging process. Expressive activity related to educational experiences designed to increase self-expression. Examples of expressive activities included hobbies and crafts, music, art, literature, and travel experiences. The following conclusions were derived (47):

1. Transportation problems and educational activities offered in the evenings are factors limiting older people's participation.

2. More educational programs and activities should be offered in residential or senior citizen centers.

3. The interests and needs were varied, but special attention should be given to instrumental forms of activities and courses.

Whereas Fair (37), Kelly (58), and McCatty (73) observed that the responsibility for making lifelong learning a reality lay in the college programs of teacher training,
Hiemstra suggested the responsibility lay within the adult education profession—with the practitioners and the researchers (47).

Further research concerning older adults and learning was conducted by Hiemstra (49), who obtained support from the Adult and Community Education Section of the State Department of Education in Nebraska. Eight graduate students were trained to administer the interview schedule developed by Tough in 1970 (101). Maintaining the underlying concept that positive attitudes and skills in pursuing lifelong learning foster adjustment to changes in later years, Hiemstra endeavored to develop a better understanding of the experience of aging by studying the activities of older adults and their perceived obstacles to learning.

The 256 individuals were chosen by means of a random selection of the voter registration cards located in and around Lincoln, Nebraska and by a random selection of the list of residents living in two facilities built especially for the elderly and from the roll of a Mexican-American community center in a middle-sized Western Nebraska town. Approximately 60 percent of the population were female, white and middle class. Most were married and 19.6 percent had obtained a college education. The range in age was 55-98 and the mean age was 68.11.
A four part interview schedule was developed to obtain data. Section A related to demographic information including questions on sex, age, formal education attainment, occupation and marital status. Section B was designed to obtain information concerning perceived obstacles to participation in learning activities. The list of potential inhibitors was obtained after a thorough review of the literature. Section C was constructed to identify the interest of the subjects in instrumental type activities versus expressive type activities. Extensive study of the literature and of course offerings from institutions offering adult education programs for the elderly were conducted prior to constructing a tentative list of activities. Three adult education/gerontology experts were asked to identify the instrumental and the expressive activities and a final list was devised using those activities in the list which were unanimously selected by the panel of experts. The final list included thirty-two possible courses, sixteen instrumental and sixteen expressive. These were included in a pilot-test with four people, ages 57, 60, 68 and 81 respectively. The data were analyzed statistically for reliability and validity and found significant at the .001 level of significance (49, p. 30-31). Section D included the interview schedule refined by Tough in 1970 (101) which served to identify the number of learning projects initiated
by older adults within the previous twelve months and to obtain an estimate of the number of hours they spent learning during that time. The questions were designed to determine the types of learning projects, the major planner of the projects and the reasons why the project had been pursued. The interviews were arranged and administered to the older adults. Only seventeen individuals refused to be interviewed and several people were unwilling to finish the interview claiming that it was taking too long.

Hiemstra's Table 22 (49, p. 105-106) compared the results from six studies which had administered Tough's interview schedule for collecting data. Table 22 included the results from studies conducted by: Tough (101), Coolican (19), McCatty (73), Denys (29), and Hiemstra (49). Even though focus varied for each of the studies, all had similarities. Not all six studies reported on all factors, and some studies limited the learning projects to those specifically related to professional experiences. Table I presents a synopsis of Hiemstra's Table 22.

In the 1975 study Hiemstra reported the average number of learning projects was 3.3 and the average number of hours spent learning was 324.56 hours. Hiemstra stated "Certainly the evidence available from this study shows that older adults are very actively involved with learning. They are a busy group, with lots of additional interests yet to be
satisfied, but with several obstacles that may prevent their full participation in learning endeavors" (49, p. 64).

**TABLE I**

HIEMSTRA'S TABLE 22. A COMPARISON OF SUMMARY RESEARCH STUDIES ON LEARNING PROJECTS

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Tough (N=66)</th>
<th>Coolican (N=48)</th>
<th>Johnn (N=39)</th>
<th>Mc-Catty (N=54)</th>
<th>Denys (N=40)</th>
<th>Older Adults (N=214)</th>
<th>Fair* (N=35)</th>
</tr>
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<tbody>
<tr>
<td>Number of Learning Projects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>8.3</td>
<td>4.2</td>
<td>8.4</td>
<td>11.1</td>
<td>4.8</td>
<td>3.3</td>
<td>8.8</td>
</tr>
<tr>
<td>Range</td>
<td>0-20</td>
<td>1-9</td>
<td>1-22</td>
<td>2-31</td>
<td>1-12</td>
<td>1-9</td>
<td>5-14</td>
</tr>
<tr>
<td>Percent of Participation</td>
<td>98%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>83.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Planner Type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>68%</td>
<td>66%</td>
<td>56%</td>
<td>76%</td>
<td>75%</td>
<td>55%</td>
<td>97%</td>
</tr>
<tr>
<td>Group</td>
<td>12%</td>
<td>16%</td>
<td>16%</td>
<td>11%</td>
<td>11%</td>
<td>20%</td>
<td>...</td>
</tr>
<tr>
<td>One to one</td>
<td>8%</td>
<td>13%</td>
<td>9%</td>
<td>7%</td>
<td>6%</td>
<td>10%</td>
<td>...</td>
</tr>
<tr>
<td>Resource</td>
<td>3%</td>
<td>5%</td>
<td>19%</td>
<td>1%</td>
<td>4%</td>
<td>4%</td>
<td>...</td>
</tr>
<tr>
<td>Mixed</td>
<td>9%</td>
<td>...</td>
<td>...</td>
<td>5%</td>
<td>3%</td>
<td>10%</td>
<td>...</td>
</tr>
<tr>
<td>Subject Matter:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational-Vocational</td>
<td>N.A.</td>
<td>7%</td>
<td>30%</td>
<td>55%</td>
<td>45%</td>
<td>16%</td>
<td>63%</td>
</tr>
<tr>
<td>Personal-Family</td>
<td>N.A.</td>
<td>57%</td>
<td>23%</td>
<td>14%</td>
<td>22%</td>
<td>20%</td>
<td>N.A.</td>
</tr>
<tr>
<td>Social-Civic</td>
<td>N.A.</td>
<td>8%</td>
<td>10%</td>
<td>9%</td>
<td>13%</td>
<td>9%</td>
<td>N.A.</td>
</tr>
<tr>
<td>Self-Fulfillment</td>
<td>N.A.</td>
<td>27%</td>
<td>38%</td>
<td>22%</td>
<td>20%</td>
<td>54%</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

*Information from Fair's study was added to Hiemstra's Table
Hiemstra included a list of twenty-five statements representing barriers to learning. Health related obstacles, perceptions of personal problems and time constraints were considered major barriers to learning. "Don't have enough energy or stamina," "I'm too old to begin learning," and "My health is bad," are three statements expressing perceived reasons for not participating in educational activities (49). Hiemstra reported,

Considerable learning activity is taking place among the older population, despite a variety of obstacles. Thus, the evidence of study should help break down even more some of the myths about the declining abilities and the inactivity of the older person. As was suggested in Chapter I, education and learning can be utilized to replace the lost roles and activities that occur with age and thereby maintain morale, productivity, and a meaning in life (49, p. 73).

In his final chapter Hiemstra constructed seventeen formal recommendations and a list of sixteen suggested research topics. Three of the recommendations he made were, as follows:

1. That educators find new and non-traditional means for making learning opportunities more available to the older person;

2. That some of the top ranked obstacles in this study and those noted in other writings be addressed in order that educational opportunities can be utilized by older persons as a means for more fulfilling lives; and

3. That health educators find means to make learning
opportunities more available to the older person with health problems.

Hiemstra contributed pertinent information about the learning potential of older adults and has made progress toward dispelling misconceptions about the relationship between aging and learning.

Older Adults and Fitness

Hiemstra (49) reported that older adults were likely to encounter many physical and mental obstacles to learning. Of the physical deterents, health problems were frequently cited as being important, especially the lack of energy and stamina. Buccola and Stone (14), Cooper (20), Cureton (26), devries (30), Shephard (94), Sidney (97), and Simmons (98), conducted studies examining the effects of regular exercise on the cardiorespiratory system of older adults and have reported significant improvements. Increasing the efficiency of the cardiorespiratory system increased the attainment of endurance and vigor, and decreased the onset of fatigue (14, 20, 26, 30, 94, 97, 98).

Thomas K. Cureton conducted and/or supervised a number of graduate research studies pertaining to adult physical fitness. One study (26) evaluated twenty types of fitness programs, including Cureton's continuous rhythmical endurance process (a combined continuous jogging and calisthenics program). He concluded that a progressive
rhythmic type of exercise was superior to non-rhythmic activities when seeking circulatory changes for adults, and that improvement of circulation increased endurance and stamina for the older adults.

A five-year study was conducted by Herbert A. deVries to determine the level of trainability in people fifty to ninety years of age. It was designed to establish dose-response characteristics, and to evaluate health benefits and improvement in physical vigor in older people participating in supervised exercise. In conclusion deVries stated,

... for all but the highly conditioned older men, vigorous walking, which raises the heart rate to 100–120 beats per minute for 30–60 minutes daily, constitutes a sufficient stimulus to bring about some, though possibly not optimal, improvement in cardiovascular-respiratory function (32, p. 51).

He recommended that exercise programs for older people should maximize the rhythmic activity of large muscle masses in order to produce changes in the cardiorespiratory system, which reduces the onset of fatigue and has beneficial effects on physical endurance. Older adults who suffer high levels of fatigue experience more difficulty when trying to pursue learning (29).

Gene M. Adams and Herbert A. deVries (1) used seventeen women (mean age 65.9) to study the trainability of the cardiorespiratory system. The subjects participated in a regimen of calisthenics, jogging and stretching movements
for one hour, three times a week for three months. The exercise intensity was regulated by approximately 60 percent of maximum. The results indicated significant improvement of fitness, similar to those frequently reported for young females (1). It would be beneficial to determine the association of vigorous effort invested in such activities as housework or yard work with the efficiency of the cardiorespiratory system of the older adult.

A study by Victor A. Buccola and William J. Stone (14) investigated the effects of jogging and cycling programs on physiological and personality variables in aged men. Thirty-six men, ages ranging from 60-79, trained 25-50 minutes a day, three days a week for 14 weeks. Sixteen participated in walk-jogging and 20 participated in cycling. All subjects were pre and post-tested on the Astrand bicycle ergometer test and the Cattell Personality Factors. The subjects were placed in one of two workload categories for each program according to the results of the ergometer pre-test. Modifications of Cooper's (21) recommended cycling and walk-jog programs were developed. The different groups were given exercise prescriptions devised to produce essentially the same energy expenditure. The training program was supervised daily by one or both of the investigators and consisted of ten minutes of warm-up exercises followed by ten to forty minutes of cycling and jogging. Conclusions indicated both groups increased the
estimated maximum oxygen consumption and the cycling group showed a decrease in the percent of body fat. Both groups showed decreases in blood pressure. The personality changes over a fourteen week interval were slight as measured by Cattell's Sixteen Personality Factors. No research was found investigating the association of 25-50 minutes of daily exertion in ordinary tasks (such as house or yard work) with the efficiency of the cardiorespiratory system of older adults.

Much of the information pertaining to fitness has been interpreted and recommendations for programs designed to increase or maintain adequate levels of fitness for health have been developed by physiologists. Studies conducted by Shephard (94), Sidney (97), and Cooper (21) have investigated the cardiorespiratory changes resulting from participation in vigorous exercise by older adults. Improvement in efficiency of the heart and circulation and increased capacity to utilize oxygen resulted in greater ability to endure more stress and suffer less fatigue.

Roy J. Shephard discussed training programs which strive to produce cardiorespiratory changes in older adults in his book Physical Activity and Aging (94). He suggested that the most desirable training programs for older adults were marked by safety, effectiveness, a strong motivational appeal, and low unit cost. No research was found
identifying older adults who have maintained adequate functioning of the cardiorespiratory system and to examine ordinary tasks which might also produce cardiorespiratory efficiency.

The maximum heart rate in older people reduces with age, and the older persons' initial fitness levels are usually low; therefore, the necessary heart rate for training effect during the beginning of exercise programs needs not be higher than 120-130/minute according to Shephard (94). There should be progressions from the initial heart rate to training rates of 140-150/minute as soon as exercise tests indicate this to be safe. The aim should be to attain thirty minutes of vigorous activity three or four times a week.

Motivation of the older adult to seriously participate in an exercise program requires the leadership of a caring person who is knowledgeable in the specific needs of this age group and has a personality which assures the participant of success and well being (30, 94). This leader must not only appreciate the strengths of the participant, but also the limitations, and be able to provide meaningful feedback which effectively enhances body image of the participant. The main objectives should include continuous improvement of health and fitness; reduction of physical fatigue and increased stamina and vigor. Cost is a factor in determining whether or not older adults are likely to
join any program. Even if the money were available, the incident of older adults investing large amounts of their income in a fitness program is unlikely. It is desirable to provide inexpensive exercise opportunities for older adults through the use of local facilities and existing equipment (94).

Kenneth H. Sidney (97), concluded that the majority of studies relating to cardiovascular changes of elderly people in response to submaximal exercise has found improvement in the physical work capacity and an increased economy of effort. Sidney indicated that beneficial effects of physical conditioning were attributable to a reduction in the number of heart beats per minute and, therefore a greater efficiency of heart effort. Participation in vigorous activity programs lasting six to eight weeks resulted in measurable improvements in the cardiovascular system.

Kenneth H. Cooper developed the Aerobic Center, located in Dallas, Texas which was based on three major components, a medical clinic, a research center, and an activity center. The research conducted by Cooper was originally based on studies using service men and women; older ages were seldom included. The research conducted at the Aerobic Center included all ages. Cooper defined aerobic exercise to mean the exercise which "...demand oxygen without producing an
intolerable oxygen debt, so that they can be continued for long periods" (20, p. 22). He has established exercise prescription charts for different age groups with the purpose of providing information for safe and effective progressions for exercises designed to improve the cardiovascular system. He has developed exercise prescriptions for ages under 30, between 30-39, 40-49, 50-59, 60 and over and for cardiac patients. Cooper recommended activities that were brisk and sustained, such as: walking, running, cycling, swimming, rope skipping, stationary running, and stair climbing. In *The Aerobics Way* (21), Cooper includes a list of comparable point values for a number of vigorous activities for individuals over sixty. This list included, walking, cycling, swimming (overhand crawl), and stationary cycling. The point system provided the participant with ways to include a variety of activities in his/her physical fitness program. Many participants have found this idea to be far more interesting and motivational than an exercise prescription limited to one activity.

In summary, the major thrust from the work conducted by Cureton (26), devVries (32), Adams (1), Buccola and Stone (14), Shephard (94), Sidney (97), and Cooper (21) indicated that exercise offers a positive effect on the cardiorespiratory system of average older adults. Physical fatigue and lack of stamina are by-products of sedentary living and not necessarily a result of the aging process.
Three of the studies recommended activities which were sustained and rhythmical and all agreed that gradual increase of duration and intensity of exercise is important if improvement of cardiorespiratory systems is expected. This research had one thing in common—all studies sought to measure the improvements in cardiorespiratory efficiency after participation in a monitored program of activities over a set time period. No study was found surveying the population to determine how many older adults maintain efficient levels of physical fitness and to define the ordinary activities vigorous enough to increase the heart beat and combat the loss of vigor and increase of fatigue generally associated with aging.

Another publication, Exercise and Your Heart was written by the National Heart, Lung and Blood Institute and published by the U. S. Government Printing Office in 1981. This is an attractive, colorful forty-three page booklet and is free to the public. The contents of this pamphlet presented a summary of research on the effects of exercise for preventing heart attacks, myths about exercise, and suggested exercises for conditioning the heart and lungs. Concerning the myth of older persons needing less exercise, this advice was stated,

In general, middle-aged and older people benefit from regular exercise just as young people do. Age
need not be a limitation. What is important, no matter what your age, is tailoring the exercise program to your own fitness level (79, p. 19).

Repeated throughout the booklet was the concept that exercise must include three characteristics to successfully condition the heart and lungs—be brisk, be sustained and be regular (79, p. 20). Brisk was defined as raising the heart and breathing rates. Sustained was explained as lasting fifteen to thirty minutes without interruption. Regular participation was defined as a minimum of three times a week. A major tenet of the booklet was that participation in exercise can help older adults feel better and enjoy life more. Many ordinary tasks, such as house and yard work can be brisk enough to raise the heart and breathing rates and sustained for an extended period of time.

Efforts to provide healthy competition in vigorous activities, such as sports and dance, were developed for adults with hopes of motivating lifetime participation. The Amateur Athletic Union has organized competition for older adults in swimming and track. YMCA's frequently offer competitive events for participation by older adults. Events such as bowling, walking, and games are popular and attract many competitors.

The Texas Department on Aging and the University of Texas at Arlington co-sponsor an annual Texas Senior Games (9), which has the following three purposes: (1) to promote
physical fitness and well-being of Senior Texans; (2) to provide public information and public education regarding physical fitness, lifetime sports, and recreational activities for Senior Texans; and (3) to change the public's image and attitude of aging and older persons to the realization that older persons can remain physically fit, have fun, have a desirable quality of life, and remain active in the community (9). The 1984 Texas Senior Games provided nineteen events, including vigorous activities as well as table games. There were six age groups: 50-54, 55-59, 60-64, 70-74, and 75 and over. A Sports Medicine and Physical Fitness Clinic was conducted free of charge for participants and their spouses. Opportunities to learn more about nutrition, physical conditioning and training were provided by experts trained in gerontology. By providing competition in vigorous activities for older adults, public attention has been directed toward the potential value of exercise for older men and women.

Researchers have reported that an active lifestyle can benefit the adult's level of stamina. Efforts to educate the public concerning the importance of maintaining levels of physical fitness throughout all of life have been offered by many community resources. The promotion of competition for older adults has drawn attention to the value of exercise for older adults and has publicized the benefits of maintaining an active lifestyle, which may contribute to
the increase of physical stamina and to the enjoyment of lifelong learning, regardless of age. Research in exercise physiology supports the contention that physical stamina is increased by participation in vigorous physical activity. Research in adult education (49) has shown fatigue and lack of vigor to be barriers to continued learning for older adults. No research was found investigating the association of health characteristics with continued learning by older adults.
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CHAPTER III

PROCEDURES OF THE STUDY

Overview

The purpose of this study was to determine the number of learning projects undertaken by retired educators during one year and to examine the association between selected health characteristics and participation in learning projects. The health characteristics were body weight and the amount of participation in physical activity. Average weight and overweight classifications were determined by means of the Metropolitan Height and Weight Tables.

The procedures of the study are discussed under the following topics: the population and sample selection, the Human Consent Form, the interview instrument, the interview procedure, and the analysis of the data.

Population and Sample Selection

The collection of data was by means of interviews. A minimum of thirty interviews was planned. Tough (8) indicated that as few as twenty-five interviews were adequate to establish a fairly consistent pattern of learning activities. More interviews would apparently produce very little variation in the pattern (5). A population goal of 1000 possible names for the interview was set and 200 names were
chosen by random selection to receive a brief questionnaire. Persons who responded and who met the specified criteria were contacted for a personal interview.

The Teacher Retirement System of Texas was contacted and a request was made to obtain a computerized list of names of retired teachers from eleven counties in the North Texas area. A follow-up interview with an executive of the Teacher Retirement System of Texas provided only a recommendation to contact the Retired Teachers Association of Texas. No list was provided by Teacher Retirement System of Texas.

The Retired Teachers Association of Texas provided a list of names of the presidents of each district unit representing the eleven counties. All districts were contacted by mail, and 115 names and addresses were returned from small towns. No response was received from the large cities or suburbs.

Consideration was given to using the directory from Delta Kappa Gamma and Phi Delta Kappa, honorary teacher associations. Permission from Delta Kappa Gamma was granted, but after further study it was decided that names from an honorary society would represent a unique group, not a typical group of retired teachers.

Public school districts were contacted for names of retired teachers. Interviews were conducted for this purpose
at four school districts. In the Dallas/Fort Worth metroplex three of the districts agreed to have a secretary retrieve this information from their computer and the list was available within a week. This provided 169 names.

It was possible to locate a copy of the 1982-1983 directory of the Dallas Retired Teachers Association. This was a complete list of all living retired Dallas employees including clerical staff, custodial staff and food service staff. Comparing the 1982-1983 directory with the 1979-1980 directory and selecting only the names added since 1979 provided a possible list of recently retired teachers. This provided 534 names.

One hundred and eighty-four names were obtained from the 1983-1984 directory of the Fort Worth Retired Teachers Association using the same procedure used with the Dallas Retired Teachers Association list. This increased the total to 1002 names. Letters were sent to fourteen colleges and universities located within a forty mile radius of Arlington, Texas. These letters were sent to the director of personnel and included a brief description of the proposed study and a request for names and addresses of recently retired teachers who had taught twenty or more years. Prompt response was made by two of these individuals. Follow-up telephone calls and interviews resulted in seven replies and eighty-nine names were offered. The total number of 1091 names was obtained and a numerical order was
established for the completed list. The list included the names of a few employees who were not retired teachers or administrators or possibly had not served for twenty years or more.

Two hundred names were selected by using a Table of Random Numbers (7). Two letters, a brief questionnaire and a stamped return addressed envelope were prepared explaining the purpose of the study and asking each recipient to fill in the enclosed questionnaire and return it by December 5, 1983. (see Appendix A)

The questionnaire included the following three parts: (1) personal and professional history, (2) questions concerning their leisure activities and their efforts to continue learning, and (3) space to grant permission to be contacted by phone.

The personal information included date of birth, sex, race, height, weight and body frame size. The professional information included subject and grade level taught, number of years in education and date of retirement. Space was provided to grant permission to be contacted by phone by signing their name, giving their phone number and indicating the most convenient time to be contacted.

The prime purpose of the questionnaire was to obtain the following information:
1. Age;
2. Length of service in education as a salaried teacher or administrator;
3. Date of retirement;
4. Height, weight and body frame size; and
5. Permission to be contacted by phone and their phone number.

Upon receipt of the returned questionnaire the information was studied and those fulfilling the necessary criteria for the study were contacted by phone.

The first priority was to establish two groups—a group composed of retired teachers who were estimated to be average weight and a group composed of retired teachers who were estimated to be overweight. Underweight respondents were not included because one purpose of the study was to examine the association of overweight with efforts to continue learning, and the addition of an underweight group would add variables to the study and complications to the availability of the population. The 1983 Metropolitan Height and Weight table (3) was used to classify the subjects as either average weight or overweight. This chart was based on lowest mortality estimates and had been used for many years. In 1983 it was revised and the estimated range for average weight was increased due to insurance mortality records. The chart was based on the men
and women age range 25-59, and overweight was based on height in one inch heels, weight and body frame size. No other chart was found which could be used for the purpose of easily classifying the groups without scientific equipment and laboratory facilities.

Returned questionnaires were received promptly and by December 6, 1983, forty-five questionnaires had been received from respondents who met all five criteria measures. By December 15, it became apparent that there were not going to be enough respondents meeting all of the specified criteria. Provisions were made to select 200 more names continuing in the same manner as before using the Table of Random Numbers. On December 31, 1983, the additional surveys were mailed bringing the total number contacted to 400.

Names which met the five major criteria were selected for telephone contact, which was made by the researcher and an assistant. The telephone conversation developed according to the following:

1. Introduction; identification of the study;
2. Expressed appreciation for returning the questionnaire and for being prompt;
3. Asked if there was time to answer a few questions, if not, would call at another time;
4. Verified: date of retirement, total number of years teaching, total number of years in administration
duties, total number of years in each subject area and in each grade level, date of birth, and if the designated height was in one inch heels or in other type of footwear;

5. Explained that the first phase of the study was the questionnaire; the second phase required a personal interview; a particular phase of their experience (reading specialist, first grade teacher, librarian, administrator or secondary teacher) was mentioned and it was explained that their data would be especially important; they were told that the researcher would like very much to include them in the second phase of the study if they would grant the opportunity to be interviewed;

6. If they agreed to the interview, they were told that the interview would require approximately two hours and the interviewer would be happy to come at any time they chose and would meet them in their home, at a public library, or conduct the interview in the sofa area of a travel van parked anywhere they specified; (It was expected that older adults might hesitate to invite a stranger into their home. The location of the interview was left entirely up to their preference.)

7. After the date, time and place were set, the phone number of the investigator was given for them to use if they needed to make any changes; and,
8. In closing the conversation, appreciation for their cooperation was expressed and if the interview had been granted, they were told how much the researcher was looking forward to meeting them and to discussing their learning experiences since retiring.

Human Consent Form

Prior to beginning each interview, and after introductory conversation, a Human Consent Form was given to the subject explaining the procedures, purposes and statements describing any possible physical, psychological or social risk which could accrue from participation in the study. The statement assured confidential treatment of all information given during the interview and assured the subject of the possibility of withdrawing from the study at any time without penalty or prejudice if they should later desire to do so. (See Appendix D for Human Consent Form.)

The Interview Instrument

The complete interview instrument consisted of the following four parts: a form for demographic data; an interview schedule to estimate the amount of participation in physical activity during the previous twelve months; Tough's (8) interview schedule designed to determine the amount of learning initiated during the previous twelve months; and, three final questions relating to life-satisfaction. To obtain an accurate estimate of the
person’s frame size, a measurement of the elbow width was taken by means of calipers. Height, weight, and frame size were necessary data required to classify the person as average weight or overweight according to the Metropolitan Height and Weight Tables (3).

Part A was designed to answer questions on age, weight, height, frame size and professional experiences. The amount of education, grade level and subjects taught were reported and the number of years serving as a teacher, specialist or administrator was indicated as well as the year of retirement. This information was given by the respondent on the questionnaire received in the mail. All information was verified during the telephone contact and prior to the beginning of the interview questions.

Part B concerned exercise and physical characteristics. A probe sheet (a reminder sheet) was developed to assist the recall of participation in physical activity during the past twelve months. A search of the literature was made concerning all aspects of physical exertion. The chart published by McArdle, Katch and Katch (6) listing energy expenditure in household, recreational, and sports activities was used as a guide for suitable activities. A review of the competitive events included in the Texas Senior Games (1) was made and any physical activities not
included in the Energy Expenditure chart were added to the list.

The questions related to physical activity were formed to provide information concerning the following:

1. Mental attitude about physical exercise;

2. Amount of weekly participation in exercise; and,

3. Intensity of participation.

A form was designed to record the number of minutes per week spent participating in physical exertion during the past four seasons of the year. Space for recording the estimated number of minutes spent in each activity during the fall, winter, spring and summer of the year was designed. The number of minutes spent weekly in each activity for each season was totaled and divided by four to obtain an average number of minutes per week spent physically active.

After compiling the tentative list of activities and designing the format for collecting the information, Part B was administered to three volunteers: two older adults (one man and one woman) and one physical educator who was experienced in research. Each practice was timed and prior to conducting the interview schedule, the volunteer was invited to relate impressions they had and to offer suggestions for improvement. The three volunteers only offered questions concerning certain items included in the
list of activities. The time for administering the complete section was 20-30 minutes.

A revision of the list of activities was made and a tentative interview schedule was prepared and sent to three experts who had agreed to critique this original section for the purpose of making suggestions for improving the process. One expert was Roger Hiemstra, who had conducted studies using the Tough interview schedule and had investigated learning projects initiated by older adults. Another expert was Toshio Moritani, an exercise physiologist who had conducted research with Herbert deVries at the University of Southern California Gerontology Center, Laguna Hills, California. The third expert was Susan Plank, Director of Community Services and a specialist for older adults at the Downtown YMCA, Fort Worth, Texas. The proposed instrument was examined by all three experts and returned with suggested changes, which included rewording for clarity and increasing the range of answers for one question. It was also suggested that the list of activities in the probe sheet was too lengthy. It was suggested that the weekly estimate of amount of physical activity should be computed in terms of hours instead of minutes, since the number of minutes would become so large. All of the suggestions were considered and revisions of the wording was made. The range of answers for the specified question was increased and the probe sheet was condensed. The list of activities in the
probe sheet was divided into the following seven categories: (1) Physical Care; (2) Recreation (games, sports, dance and hobbies); (3) Housework; (4) Labor; (5) Yard and Garden; (6) Animal care; and, (7) Other. This provided clarity. Several of the activities were deleted and some were combined under the major headings. The weekly estimate of amount of physical activity was changed from minutes to hours.

Part C was the revised version of Tough's (8) interview schedule. It was designed to determine the number of learning projects initiated within one year, the number of hours spent learning, the reasons for learning, the major planner of the learning, the resources used and the current status of the project. Tough's interview schedule has been used repeatedly since 1970 by many researchers who have expressed assurance that the instrument is reliable and valid. Denys (2) administered Tough's interview schedule with teachers and business managers and selected ten subjects to maintain a learning activity diary for the purpose of comparing this procedure with the interview schedule. Denys concluded, "The combined evidence would indicate that the time investments derived from the interviews is a conservative estimate of the total time devoted to major, sustained, learning efforts" (2, p. 69). Hiemstra used Tough's interview schedule and in an effort to
insure reliability followed the interview by telephoning
selected respondents one month after their interview and
repeated some of the interview questions. Hiemstra report-
ed,

Although statistical testing was not attempted with
such a small follow-up sample, the researcher be-
lieves that because there were so few differences
between the telephone information and the interview
data, especially on the obstacles and course pre-
ferences information, the instrument and the inter-
viewers were quite reliable (4, p. 28).

The prevalent criticism of the instrument was the likeli-
hood of it being conservative in the results.

Hiemstra limited the definition of projects to omit
"...any activities undertaken primarily for entertainment or
recreational purposes" (4, p. 28). This researcher did not
include this limitation on the definition of learning
projects, as growth in recreational skills was considered to
be highly significant in the transition from a full time
career in education to productive retirement.

Four retired teachers were contacted and invited to
participate in the pilot study. There were three women and
one man. Three were average weight and one was overweight. Of the four there was one university professor, one
elementary teacher, one elementary music specialist and one administrator. Their ages were 62, 70, 72 and 81. The
first interview took two hours and five minutes. The second
interview took two hours and thirty minutes and the third
lasted two hours and five minutes and the fourth interview
lasted two hours. The lowest number of learning projects was six and the highest was fifteen, the mean number was ten. After completing all four interviews minor revisions in data recording were made. Two categories were added to the list of reasons for undertaking a learning project—(1) challenge, and (2) learning. Arrangements to proceed interviewing with the selected respondents were made with the understanding that the first interview would be counted as a trial if it resulted in difficulty that indicated further revisions.

Preparation for coding the data was designed similar to the process used by Niemstra. Copies of the data sheets are included in Appendix C.

**Interview Procedure**

Appointments were arranged with thirty-eight retired teachers. Thirteen lived in Dallas and eight lived in Fort Worth, for a total of twenty-one residing in a large city. Thirteen of the individuals lived in the suburbs of the Dallas-Fort Worth metroplex. Four of the subjects lived in a small town. All but one of the interviews were conducted during the daytime, and all but three were conducted in the home of the retired teacher. One interview required two visits to the office of the subject who was continuing to serve the school district on a part time basis and could not allocate more than one hour of time per visit. The average
time for conducting the interview was one hour and thirty-five minutes. The briefest interview was thirty-five minutes and the longest interview required two hours and forty-three minutes.

All of the interviews were conducted by the researcher. The following discussion describes the procedure established for conducting the interview.

1. Casual conversation was begun to introduce the researcher to the individual and to establish rapport. Time was spent verifying some of the demographic data.

2. The purpose of the interview was explained and the Human Consent Form was presented for the person to read and to sign.

3. The study was further discussed, beginning with the investigation of the amount of participation in physical activities during the past year. The questions from the probe sheet were completed. The subject identified all activities in which they had participated during the past year. Next, the subject was asked to estimate the amount of time spent in each activity during each of the four seasons of the year.

4. After the term "learning projects" was defined, the questions relating to the number of learning projects initiated during the past twelve months were presented. The subject was asked to list the various topics which had been
studied during the past year. When there was some doubt as
to the nature of the project, questions were asked as
follows: (1) Was the project pursued deliberately to
learn, and (2) How much time was spent learning during a
six-month period?

The individual was encouraged to mention as many
topics as he/she could remember. When he/she seemed to lack
ideas for any more topics, the probe sheet was presented and
he/she was asked to read through the list to look for addi-
tional topics. After no more topics could be remembered,
the investigator made specific inquiry about each of the
topics mentioned. Not everyone followed this procedure.
Occasionally, a person would mention a topic and
immediately begin specifying aspects of their learning.
No effort was made to enforce the continuation of list-
ing of all topics before discussing any one in detail.

A separate form was designed for the purpose of re-
cording the information cited for each learning project or
topic studied. Having a separate form for each learning
project provided easy organization of topics. Sometimes,
topics overlapped, and other times, the topic was deleted.
Quick reorganization was made concerning the most logical
sequence for the detailed inquiry. Effort was made to first
discuss in detail the topic which was most likely to be easy
to recall such details as learning episodes and the re-
sources they had used for learning. After discussing one
or two of the topics the individual became familiar with the process and further discussion progressed rapidly.

5. After all topics were examined in depth, the interviewer asked if any other possible topics had been remembered. Occasionally the researcher identified a topic that had been suggested through casual discussion of other topics. The person was asked if such a topic could be another learning project that had been forgotten. Sometimes it was added to their final list.

6. In concluding the interview, the three questions relating to life-satisfaction were asked. The interviewee was told that the interview was nearly completed, and the following questions related to their life-satisfaction, (1) What phase of your life do you consider to have been the most rewarding or satisfying, and (2) What phase of your life do you consider to have been the least rewarding or satisfying? The final question of the interview was: Do you have any chronic illnesses or disorders?

7. The final step in the interview process was the measurement of the breadth of the elbow joint by means of calipers. This was amusing but no one seemed to mind and it only took a few seconds. If they wore long sleeves, they were asked to roll up the sleeve on their right arm, if they were right handed, and to bend their forearm and keep their upper arm parallel to the floor. It was explained that this
was necessary to compute their body frame size. After the measurement was taken, they were told their body frame size as classified by the Metropolitan Life Insurance Table.

8. In leaving, appreciation was expressed to them for cooperating with the study and for spending their time in participating in the interview.

The data were reviewed and recorded on data sheets as soon as possible. In two instances the interviewees were later contacted by telephone to clarify the information recorded.

Analysis of the Data

Categorizing and coding of data were determined and followed the procedure used by Hiemstra in his study with older adults. After each interview the data were reviewed and transcribed to the tabulation sheet as soon as possible.

All data were checked for coding errors or inconsistencies. There were no missing data. Following computer analysis, specifically, the t-test for independent samples and Pearson product moment correlation were computed. Descriptive statistics and cross tabulations were compiled.
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CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Statement of Purpose

The reason for conducting this study was to identify and determine the number of learning projects initiated by retired educators within one year and to examine the extent to which these experiences were associated with body weight and exercise patterns of the subjects. It was also the intent to compare the results of this study with the results of previous studies. The gathering of the data was guided by the following six hypotheses.

1. The mean number of reported learning projects initiated in one year among average weight subjects will be higher than the mean number of learning projects initiated in one year among overweight subjects.

2. The mean number of reported hours spent in learning projects in one year by average weight subjects will be higher than the mean number of reported hours spent in learning projects in one year by overweight subjects.

3. There will be a positive relationship between the number of hours spent in learning projects per year and the number of hours spent in physical activity per week.

4. The mean number of the reported learning projects
initiated by retired teachers within one year will be higher than the mean number of reported learning projects initiated within one year by Hiemstra's older adults (3).

5. The mean number of reported hours spent by retired teachers in learning projects within one year will be higher than the mean number of reported hours spent in learning projects within one year by Hiemstra's older adults (3).

6. The mean number of reported learning projects initiated in one year among retired teachers will be lower than the mean number of reported learning projects initiated in one year among Kelly's secondary school teachers (4).

The discussion of the analysis of data has been organized into the following two parts: (1) a discussion of the sample demographics, and (2) a discussion of the analysis of data relating to each of the six hypotheses.

The Sample

Interviews were arranged with thirty-eight subjects who returned the written survey and who met the following criteria:

1. Were between the ages of fifty-five to seventy-one;
2. Had served as a salaried educator for twenty years or more;
3. Had retired between the years 1979-1983; and,
4. Had granted written permission to be contacted by telephone.
Subjects who were considered underweight by the 1983 Metropolitan Height and Weight Tables (1) were not included since it was considered important to reduce the variables.

The subjects ranged in age from fifty-five to seventy-one years. There were twelve men and twenty-six females. Of the thirty-eight retired educators who were interviewed, twenty-seven were white, nine were black, one was American-Indian and one was an Arab. No Mexican-American retired educator responded to the written survey. Twenty-seven were married, seven were widowed, three were single and one was divorced. The level of education of the group is presented in Table II.

**TABLE II**

**LEVEL OF EDUCATION OF RETIRED EDUCATORS**

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Master's</td>
<td>28</td>
<td>74</td>
</tr>
<tr>
<td>Doctorate</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>38</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

All of the subjects had pursued graduate work beyond the bachelor's degree and one subject had been granted an honorary doctorate. A breakdown of the data relating to education pursued beyond the bachelor degree is presented in Table III.
TABLE III
EDUCATION BEYOND BACHELOR'S DEGREE

<table>
<thead>
<tr>
<th>Graduate Hours</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beyond Bachelor's</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Masters Degree Only</td>
<td>14</td>
<td>37</td>
</tr>
<tr>
<td>Beyond Master's</td>
<td>14</td>
<td>37</td>
</tr>
<tr>
<td>Doctorate</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>38</td>
<td>100</td>
</tr>
</tbody>
</table>

The subjects represented many different teaching assignments and administrative levels. Thirteen were elementary classroom teachers and five were elementary specialists. Four served in the secondary classroom and four were secondary specialists. Eight of the subjects had served the majority of their years in administrative roles and four were teachers in higher education. Of the elementary specialists, one was assigned to media, one was a nurse, and three were reading specialists. The secondary specialists had been assigned to homemaking, music, or R.O.T.C. A list of the assignments designated by the subjects as being the predominate assignment during their career as an educator is shown in Table IV.

The 1983 Metropolitan Height and Weight Tables (1) were used to designate the weight category of the subjects.
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Frequency</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public School Teaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary (K-6)</td>
<td>13</td>
<td>26</td>
<td>68</td>
</tr>
<tr>
<td>Secondary (7-12)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialization (K-12)</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public School Administration</td>
<td>8</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Higher Education</td>
<td>4</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Thirteen were classified as average weight and twenty-five were classified as overweight. A breakdown of the data relating to the range of weight differences of the group and the total number of learning projects initiated within the past twelve months is presented in Table V.

Findings

This section presents the findings relative to the six hypotheses upon which the study is based. The t-test (5) for independent samples was used to determine significance at the .05 level for a one-tailed test for Hypotheses 1, 2, 4, 5, and 6. A Pearson product moment correlation coefficient (5) was computed to determine the degree of relationship for Hypothesis 3. The t-test for independent samples and the correlation coefficient were computed using
TABLE V
WEIGHT DIFFERENCES OF RETIRED TEACHERS AND NUMBER OF LEARNING PROJECTS INITIATED WITHIN ONE YEAR

<table>
<thead>
<tr>
<th>Weight</th>
<th>Number of Learning Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-5</td>
</tr>
<tr>
<td>Average</td>
<td>3</td>
</tr>
<tr>
<td>0-9 lbs ow</td>
<td>1</td>
</tr>
<tr>
<td>10-19 lbs ow</td>
<td>1</td>
</tr>
<tr>
<td>20-29 lbs ow</td>
<td>1</td>
</tr>
<tr>
<td>30-39 lbs ow</td>
<td>1</td>
</tr>
<tr>
<td>40-49 lbs ow</td>
<td>1</td>
</tr>
<tr>
<td>50-59 lbs ow</td>
<td></td>
</tr>
<tr>
<td>60 lbs ow</td>
<td></td>
</tr>
</tbody>
</table>

*ow—overweight

A computer and the Statistical Analysis System (2). The responses to interview questions were tabulated and frequency and percentages were used to compare this study with other studies. The responses to the questions relating to physical conditioning and other physical activity were reported by tables showing frequency and total hours per week. (It was originally planned to count the total minutes per week, but this became so high the counting of hours was used.)
Data Relative to Hypothesis 1

The first hypothesis stated that the mean number of reported learning projects initiated in one year among average weight subjects would be higher than the mean number of learning projects initiated in one year among overweight subjects. The hypothesis was tested by a one-tailed t-test for independent samples. The difference between the means was significant at the .04 level. The results of this comparison are presented in Table VI.

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Weight</td>
<td>13</td>
<td>13.23</td>
<td>4.34</td>
<td>1.20</td>
<td>1.76</td>
<td>.04</td>
</tr>
<tr>
<td>Over-Weight</td>
<td>25</td>
<td>10.76</td>
<td>3.97</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data Relative to Hypothesis 2

The second hypothesis proposed that the mean number of reported hours spent in learning projects in one year by average weight subjects would be higher than the mean number of reported hours spent in learning projects in one year by overweight subjects. A one-tailed t-test for independent samples was computed and no significant difference was
observed between the two means. The second hypothesis was not supported by the data. The statistical analysis for this comparison is presented in Table VII.

### TABLE VII

**DIFFERENCE BETWEEN THE MEAN SCORE OF REPORTED NUMBER OF HOURS SPENT LEARNING BY AVERAGE WEIGHT GROUP AND THE MEAN SCORE OF REPORTED NUMBER OF HOURS SPENT LEARNING BY OVERWEIGHT GROUP**

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Weight</td>
<td>13</td>
<td>854.77</td>
<td>426.27</td>
<td>118.23</td>
<td>.08</td>
<td>.47</td>
</tr>
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<td>Over-Weight</td>
<td>25</td>
<td>868.32</td>
<td>530.86</td>
<td>107.97</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A correlation was computed for the relationship between the number of projects initiated by average weight subjects and their total number of hours spent learning and results indicated \( r = .73 \) (\( p = .005 \)). A correlation for overweight subjects resulted in \( r = .77 \) (\( p = .0001 \)). This would indicate significant relationship between number of projects and the total number of hours spent learning. However, the large difference in variability of the two (learning projects and hours spent learning) could be a factor in the lack of correlation between average weight subjects' perception and overweight subjects' perception of the number of hours spent in learning. Furthermore, if the 180 maximum hours imposed
by the interview schedule had not been enforced, the range of scores would have been greater.

Data Relative to Hypothesis 3

The third hypothesis stated that there would be a positive relationship between the number of hours spent in learning projects per year and the number of minutes spent in physical activity per week. During the pilot study it became apparent that number of minutes should be computed into hours for better handling of the data. The Pearson product moment method of correlation was computed using a computer and the Statistical Analysis System (2). The coefficient of correlation was .07. This indicates no significant relationship between the number of hours spent learning and the number of hours spent in physical activity weekly.

The interview schedule concerning number of hours spent in physical activity included two parts, a section designed to collect information pertaining to any effort to exercise for the purpose of maintaining or improving one's health and physical fitness; and a section designed to collect information concerning any type of activity which was vigorous enough to increase one's heart beat. Part 2 was organized into six categories, (1) Recreation, (2) Housework, (3) Labor, (4) Yard and Garden, (5) Animal Care, and (6) Other. The data describing the types of activities participated in by the subjects and perceived to have increased heart rate are presented in Table VIII.
Intercorrelations among all variables for the group
(number of learning projects, number of hours spent
learning, number of hours spent conditioning per week,
number of hours spent in physical activity per week, age,
level of education, and educational assignment) were

TABLE VIII

PARTICIPATION IN ROUTINE ACTIVITIES REQUIRING EXERCISE
AND EXPENDITURE OF PHYSICAL ENERGY

<table>
<thead>
<tr>
<th>Predominate Type of Exercise</th>
<th>Overweight N</th>
<th>%</th>
<th>Ave. Weight N</th>
<th>%</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
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<td>20</td>
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<td>Recreation</td>
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<tr>
<td>Housework</td>
<td>11</td>
<td>44</td>
<td>11</td>
<td>84</td>
<td>22</td>
</tr>
<tr>
<td>Labor</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Animal Care</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yard and Garden</td>
<td>3</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>3</td>
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<td>Other</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Number</strong></td>
<td><strong>25</strong></td>
<td><strong>100</strong></td>
<td><strong>13</strong></td>
<td><strong>100</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

The correlation of the relationship between
number of hours conditioning and the number of hours spent
in physical activity resulted in \( r = .27 \). This indicates a
significant relationship for a one-tailed test at the .05
level of significance. A tabulation of the total number
of hours spent per week in physical activity and the corresponding amount of time spent per week in conditioning activities is presented in Table IX. Four of the subjects reported no hours spent exercising for conditioning purposes.

TABLE IX

TOTAL NUMBER OF HOURS SPENT PER WEEK FOR CONDITIONING WITH THE HOURS SPENT IN PHYSICAL ACTIVITY

<table>
<thead>
<tr>
<th>Hrs In Cond.</th>
<th>4-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
<th>41-45</th>
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<tbody>
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<td></td>
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<td>2</td>
<td></td>
</tr>
</tbody>
</table>

and less than six hours spent in any type of vigorous work or recreation. Five people reported spending six or more
hours per week in exercise for the purpose of maintaining their level of physical fitness.

A Pearson product moment method correlation coefficient was computed to determine the relationship between the number of hours spent conditioning with the total number of learning projects initiated within one year. The result was $r = .31$. Correlations were also computed for average weight, overweight, male and female. The correlation of the number of learning projects and the hours spent conditioning for the average weight group resulted with $r = .11$, and for the overweight group, $r = .39$. The correlation of the number of learning projects and the hours spent in conditioning for the male group resulted with $r = .19$; for the female group the correlation for the same variables resulted with $r = .44$. The data for these correlations are presented in Table X.

Results indicate a significant relationship for the number of learning projects initiated within one year with number of hours spent exercising for physical conditioning for the total group, the overweight group and the women. The relationship is not significant for the average weight group and the men. The total number of hours
TABLE X

RELATIONSHIP ASSOCIATED WITH NUMBER OF LEARNING PROJECTS INITIATED IN ONE YEAR AND NUMBER OF HOURS SPENT EXERCISING FOR PHYSICAL CONDITIONING

<table>
<thead>
<tr>
<th>Subjects</th>
<th>N</th>
<th>%</th>
<th>Mean of #</th>
<th>Mean of #</th>
<th>S.D. of #</th>
<th>S.D. of #</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave wt</td>
<td>13</td>
<td>34</td>
<td>13.23</td>
<td>2.34</td>
<td>4.34</td>
<td>2.31</td>
<td>.11</td>
<td>.37</td>
</tr>
<tr>
<td>Over wt</td>
<td>25</td>
<td>66</td>
<td>10.76</td>
<td>1.87</td>
<td>3.97</td>
<td>2.79</td>
<td>.39</td>
<td>.03</td>
</tr>
<tr>
<td>Women</td>
<td>26</td>
<td>68</td>
<td>11.54</td>
<td>2.15</td>
<td>3.28</td>
<td>2.68</td>
<td>.44</td>
<td>.01</td>
</tr>
<tr>
<td>Men</td>
<td>12</td>
<td>32</td>
<td>11.75</td>
<td>1.77</td>
<td>5.94</td>
<td>2.56</td>
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<td>.27</td>
</tr>
<tr>
<td>Total Group</td>
<td>38</td>
<td>100</td>
<td>11.61</td>
<td>2.03</td>
<td>4.21</td>
<td>2.61</td>
<td>.31</td>
<td>.03</td>
</tr>
</tbody>
</table>

spent exercising per week by various group categories is presented in Table XI.

Data Relative to Hypothesis 4

The fourth hypothesis stated that the mean number of the reported learning projects initiated by retired teachers within one year will be higher than the mean number of reported learning projects initiated within one year by Hiemstra's (3) older adults. The hypothesis was tested by a one-tailed t-test for independent samples. The difference between the means was significant at less than the .001 level. The results of this comparison are presented in Table XII.
TABLE XI

TOTAL NUMBER OF HOURS SPENT EXERCISING BY AGE, SEX, RACE, AND WEIGHT CLASSIFICATION

<table>
<thead>
<tr>
<th>Hours per Week in Exercise</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Weight</th>
<th>&lt; 10</th>
<th>&gt; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>55-59</td>
<td>60-64</td>
<td>65-71</td>
<td>M</td>
<td>F</td>
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<td>3</td>
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<tr>
<td>4</td>
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<td>51</td>
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<td>52</td>
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<td>56</td>
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<td>57</td>
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<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE XII
DIFFERENCE BETWEEN THE MEAN SCORE OF NUMBER OF LEARNING PROJECTS BY HIEMSTRA'S SAMPLE WITH THE MEAN SCORE OF LEARNING PROJECTS BY SIMMONS' SAMPLE

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
<th>Degrees of Freedom</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiemstra's</td>
<td>215</td>
<td>3.30</td>
<td>1.95</td>
<td>.13</td>
<td>39.77</td>
<td>11.99</td>
<td>.001</td>
</tr>
<tr>
<td>Simmons'</td>
<td>38</td>
<td>11.61</td>
<td>4.27</td>
<td>.69</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: t-ratio based upon separate variance estimates.

Data Relative to Hypothesis 5
The fifth hypothesis proposed that the mean number of reported hours spent by retired teachers in learning projects within one year will be higher than the mean number of reported hours spent in learning projects within one year by Hiemstra's (3) older adults. A one-tailed t-test for independent samples was computed to test the significance of the difference, which was significant at the .001 level. The results of this comparison are presented in Table XIII.

Data Relative to Hypothesis 6
The sixth hypothesis proposed that the mean number of reported learning projects initiated in one year among retired teachers will be lower than the number of reported learning projects initiated in one year among Kelly's (4) secondary teachers. A one-tailed t-test for independent
TABLE XIII
DIFFERENCE BETWEEN THE MEAN SCORE OF REPORTED NUMBER OF HOURS SPENT LEARNING BY HIEMSTRA'S SAMPLE AND THE MEAN SCORE FOR REPORTED NUMBER OF HOURS SPENT LEARNING BY SIMMONS' SAMPLE

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
<th>Degrees of Freedom</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiemstra's</td>
<td>215</td>
<td>327.64</td>
<td>294.85</td>
<td>20.16</td>
<td>41.72</td>
<td>6.44</td>
<td>.001</td>
</tr>
<tr>
<td>Simmons'</td>
<td>38</td>
<td>863.68</td>
<td>498.03</td>
<td>80.79</td>
<td>41.72</td>
<td>6.44</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: t-ratio based on separate variance estimates.

samples was planned to determine the significance of the difference. The results indicated that the mean score for the number of learning projects initiated within one year for the retired teachers was greater than the mean score for the number of learning projects initiated within one year for the secondary school teachers.

Kelly modified Tough's (7) interview schedule by changing the focus of the inquiry to include only the learning projects which contributed to professional growth and development. She interviewed forty secondary teachers. Since hobbies and recreation were included as a content area, it was the feeling of this researcher that the total number of projects would be comparable with the total number of learning projects initiated by retired teachers. The average age of Kelly's secondary teachers was thirty-two,
whereas the average age of Simmons' retired teachers was sixty-four. Kelly's secondary teachers had taught from one to fifteen years and the retired teachers had served from twenty to forty-three years. There were no school administrators or university faculty members in Kelly's study, and Simmons' study included eight school administrators and four educators from higher education. Several demographic characteristics of Kelly's sample with Simmons' sample are compared in Table XIV.

### TABLE XIV

**COMPARISON OF SECONDARY TEACHERS WITH RETIRED TEACHERS FOR DEMOGRAPHIC CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Kelly's Secondary Teachers</th>
<th>Simmons' Retired Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Men</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Number of Women</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Single*</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Years of Service</td>
<td>1-15</td>
<td>20-43</td>
</tr>
<tr>
<td>Level of Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ele Teacher</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Sec Teacher</td>
<td>40</td>
<td>8</td>
</tr>
<tr>
<td>Administration</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Higher Education</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

* includes those who were separated, divorced or widowed.
The educational attainment of the two groups varied even though every individual in both groups had a college degree. The teachers in Kelly's sample had all completed a bachelor's degree and 10 per cent had completed a master's degree. Seventy-four per cent of the teachers in Simmons' sample had completed a master's degree and 13 per cent had achieved a doctor's degree. A comparison of the educational attainment of the two groups is presented in Table XV.

**TABLE XV**

**COMPARISON OF SECONDARY TEACHERS WITH RETIRED TEACHERS FOR EDUCATIONAL ACHIEVEMENT**

<table>
<thead>
<tr>
<th>Educational Achievement</th>
<th>Kelly's Sample</th>
<th>Simmons' Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Bachelor's Degree plus credits</td>
<td>25</td>
<td>63</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Master's Degree plus credits</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Doctor's Degree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>101*</td>
</tr>
</tbody>
</table>

* Rounding error.

Since the results indicated the mean score for the number of learning projects initiated within one year for the retired teachers was greater than the mean score for the
number of learning projects initiated within one year for
the secondary school teachers, a two-tailed t-test for
independent samples was computed. The difference between
the means was significant at the .0001 level. The results of
this comparison are presented in Table XVI.

TABLE XVI
DIFFERENCE BETWEEN THE MEAN SCORE FOR THE NUMBER OF LEARNING
PROJECTS BY SECONDARY SCHOOL TEACHERS AND THE MEAN SCORE
FOR THE NUMBER OF LEARNING PROJECTS BY RETIRED TEACHERS

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>S.E.</th>
<th>Degrees of Freedom</th>
<th>t</th>
<th>Two-tail Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Teachers</td>
<td>40</td>
<td>7.87</td>
<td>3.21</td>
<td>.51</td>
<td>76</td>
<td>4.39</td>
<td>.0001</td>
</tr>
<tr>
<td>Retired Teachers</td>
<td>38</td>
<td>11.61</td>
<td>4.21</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: t-ratio based on separate variance estimates.

This chapter has presented the data collected to answer
the six proposed hypotheses. The first part discussed the
sample demographics, and the second part discussed the
analysis of data relating to each of the six hypotheses.
The next chapter includes a brief summary, discussion of
results, conclusions, and suggestions for further research.
CHAPTER BIBLIOGRAPHY


CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS
AND RECOMMENDATIONS

Summary of the Study

This study identified the number of learning projects undertaken by thirty-eight retired educators and examined the extent to which these experiences were associated with the body weight and the exercise patterns of the subjects. A list of 1091 names of retired educators was obtained and 400 names were randomly selected to receive a brief survey seeking responses to demographic, personal and miscellaneous questions relating to their efforts to continue to pursue learning. Subjects who returned the survey with their signature granting permission to be contacted by telephone were considered as candidates for a personal interview. The majority of the hundred and sixty-nine surveys that were returned indicated race to be white; twenty indicated race to be black. No Mexican-Americans returned the survey.

Interviews were arranged with thirty-eight subjects who met the following criteria: were average weight or overweight, were between ages 55-71, had served as a salaried educator for twenty years or more and had retired no later than 1979. The 1983 Metropolitan Height and Weight Tables (1) were used to estimate weight characteristics.
The questions from Tough's (5) Interview Schedule for studying Some Basic Characteristics of Learning Projects was administered and, in addition, a probe sheet designed by the investigator was used. This probe sheet was designed to identify the number of hours spent exercising in activities vigorous enough to increase heart beat.

Data were collected through indepth interviews conducted by the investigator during December, 1983 and January, February, 1984. The interviews focused on the efforts to continue learning during the past twelve months and on the participation in vigorous exercise during the past twelve months. Interview questions concerned the what, how and why retired educators learned as well as the what, how and why they participated in vigorous exercise.

The amount of time required for the interview ranged from thirty-five minutes to two hours and forty-five minutes. There were three major influences on the length of time it took to complete the interviews. A few individuals concisely answered questions in a business-like way. Many individuals embellished every topic relating details which often led to topics other than learning projects. Some individuals felt it necessary to produce proof of their statements and sometimes provided documents, pictures and other items to validate their replies to the interview questions. Many of the subjects had conducted research during their own graduate study and appeared to have a sense
of duty for helping others conducting research. Some
expressed concern for lack of public interest in their age
group and appreciated the focus of this study.

The prevailing attitude about exercising for physical
fitness purposes was predominately positive. When asked,
"Do you regularly participate in exercise for purposes of
improving your health or physical fitness," twenty-seven
answered "yes" and eleven answered "no." One of the "no's"
later listed running to be a weekly conditioning activity
during spring and fall seasons. Two of the people answering
"yes" explained that they believed in the benefits of
regular exercise but were unable to participate in vigorous
exercise. One man answered "no" but later explained that he
could not walk vigorously due to muscle cramps occurring in
his legs.

A measurement of the width of the elbow and the
reported height in one-inch heels was required to determine
frame size. The measurement of the width of the elbow was
conducted at the end of the interview. The subject was
asked to bend the elbow of their right hand if they were
right handed, or their left hand if they were left handed.
Holding their forearm vertical, and the upper arm horizontal
to the floor, the measurement was determined using a
caliper. (Coats were removed if they were worn.) This
procedure brought comments, such as, "I've never had my
elbow measured before," or a smile and curiosity about the purpose of such a measurement. It was explained that the chart being used to determine frame size required this statistic and none of the subjects objected to the measurement. If the individual was extremely obese, this procedure was omitted. Twenty-five of the subjects were classified as overweight and thirteen were classified as average weight. (One man and twelve women were average weight; eleven men and fourteen women were overweight).

The thirty-eight retired educators reported 441 total learning projects initiated during the previous twelve months. The reasons for pursuing these topics were varied and included job or profit, enjoyment, learning, challenge, service, and mixed reasons. Not one person claimed to have undertaken a learning project for the single purpose of receiving credit, or passing a test or an examination. Frequently the answer of survival, self-preservation, or protection was claimed to be the reason for undertaking a learning project. When asked if this could be classified as a challenge, several or the subjects repeated "survival" with emphasis. Since this was not included in the list of topics recommended by Tough, it was tabulated under the category of "challenge." Another category called "learning" was also added which was the single reason most frequently mentioned to represent why they invested their time in the learning project. "To
learn," or "have to know," was their reply when asked "why did you undertake this project."

The majority of learning projects utilized various sources for locating information, and the single source most often used was printed materials. Learning from an expert was mentioned for twenty-eight of the projects and learning from a group was cited to be the source for twenty-four projects. When asked who planned the learning, "I did," or "It was self planned," was the answer twice as often as any other answer.

Religion was the topic most frequently pursued. Such efforts included the study of church doctrine, church history, Bible study, comparative religions, prophecy, teacher training, preparing publications, Sunday School lessons, and many volunteer service projects. Other popular topics included travel, health, finances, appearance, nature, current events and home improvement. The topic of computers was of interest to eleven individuals.

Twenty-seven of the learning projects were related to serving the needs of the community. They included fund raising efforts, volunteer service, Motion Picture Classifying Board, politics, Crisis Prevention Board, city problems and changes. Some of the subjects served organizations by fulfilling the duties of an officer, which necessitated study and learning.
At the close of the interview the subjects were asked to list any chronic illnesses they had. Thirty-one of the subjects named one or more medical problems, but only two seemed to be restricted by their health. All seven of the individuals stating that they had no health problems were classified as having average weight. Heart trouble or high blood pressure was cited by ten of the individuals, and five reported the incidence of arthritis. Four reported diabetes, and three had kidney problems (one reported that it was under control) and three reported eye difficulty. Illnesses or impairments mentioned by only one person included impaired carbohydrates tolerance, nervousness, allergies, bronchitis, foot, knee, ulcer, back, sinus, tumors, and diverticulitis.

All of the subjects verbally expressed interest and encouragement for the completion of the study, and willingly made appointments for a two hour session. Thirty-five of the interviews were conducted in the home of the subject under cordial conditions. (Two were conducted in an office setting and one was conducted on the campus of a community college.) Prior to the time of the interview, arrangements had usually been made to prevent interruptions, such as telephone calls, grandchildren, or television viewing. One man and one woman did leave the television on during the interview.
Summary of the Findings

The statistical analysis and data collected to test the six hypotheses initiating this study are presented in Chapter IV. The interpretation of the answers resulting from this study are discussed in the following findings.

1. Hypothesis 1 was accepted, since the mean number of reported learning projects initiated in one year among average weight subjects was higher than the mean number of learning projects initiated in one year among overweight subjects. The difference between the means was significant at the .04 level.

2. Hypothesis 2 was not accepted, since the mean number of reported hours spent in learning projects in one year by average weight subjects was not significantly higher than the mean number of reported hours spent in learning projects in one year by overweight subjects. A correlation of the relationship between the number of projects initiated by average weight subjects and their total number of hours spent learning did indicate significant relationship at the .005 level. Also, the relationship between the number of projects initiated by overweight subjects and their total number of hours spent learning resulted in a significant relationship at the .0001 level. The limitation of 180 hours as the maximum number of hours spent learning could have affected the variability, as the range of scores would have been greater. Studies (3, 4) have questioned the
accuracy of self-reported numbers of hours spent learning during the past twelve months. Even though the statistical analysis might appear inconsistent, the mere act of contemplating the amount of time spent learning stimulated the retired educators to view the importance of learning from a perspective of time investment.

3. Hypothesis 3 was not accepted, since there was not a significant relationship between the number of hours spent in learning projects per year and the number of hours spent in physical activity per week. The coefficient of correlation was .07. Intercorrelations were computed to determine the relationship within groups. Results indicated a significant relationship at the .03 level of significance or less for the number of learning projects initiated within one year with number of hours spent exercising for physical conditioning for the total group (r=.31), overweight group (r=.39), and for the women (r=.44). There was no significant relationship for the average weight group (r=.11), and for the men (r=.19).

4. Hypothesis 4 was accepted, since the mean number of the reported learning projects initiated by retired educators within one year was significantly higher than the mean number of reported learning projects initiated within one year by Hiemstra's (2) older adults. The difference between the means was significant at the .001 level.
5. Hypothesis 5 was accepted, since the mean number of reported hours spent by retired educators in learning projects within one year was higher than the mean number of reported hours spent in learning by Hiemstra's (2) older adults. The difference between the means was significant at the .001 level.

6. Hypothesis 6 was not accepted, since the mean number of reported learning projects initiated in one year among retired educators was higher than the mean number of reported learning projects initiated in one year among Kelly's (3) secondary teachers. The focus of Kelly's (3) study was to include only the learning projects which contributed to professional growth and development. There were other differences between the two studies, such as age; educational achievement; and career assignment. The findings from Kelly's study indicated the difference in age was not significantly associated with the number of learning projects initiated within one year for the secondary teachers. The ages of Kelly's secondary teachers ranged from twenty-three to forty-six (average age was 32). The ages of the retired educators ranged from fifty-five to seventy-one (average age was 64). Comparing the mean number of learning projects of three age groups of the retired teachers (55-60; 61-66; 67-71) showed no significant difference. The same was true of the two age groups of the secondary teachers in Kelly's (3) study.
Conclusions

The following conclusions are based on the findings of this study.

1. Heimstra (2) reported that health related obstacles diminish learning activity. Overweight is a deterrent to health; therefore, this study supports Heimstra's premise.

2. Adult education literature indicates older people pursue less continuing education than younger people. The results from this research, as well as Kelly's (3) research, do not support that theory. However, both Kelly's sample and this sample represent a select population segment, as all of the subjects had one or more college degrees.

3. Adult education literature indicates that the levels of education are associated with the amount of learning pursued by older persons. The results of this study support this theory.

4. This study supports the theory that the person who has recently engaged in learning will be more likely to continue to pursue learning. Teachers are required to continue learning throughout their career because of frequent shifts in curriculum emphasis and due to occasional legislative changes in certification requirements.

5. Estimating the number of hours a person invests in learning during the previous twelve months offers questionable value for statistical purposes.
6. Estimating the number of hours a person spends learning is meaningful to the individual who has given very little thought to the amount of time spent pursuing learning, especially by means of self-planned learning.

7. The majority of older adults in this sample place value on participation in vigorous exercise for the purpose of their health.

8. Overweight individuals in this sample perceived themselves as spending more time in conditioning activities than did the average weight individuals.

9. The retired educators in this sample perceived learning to be essential and they utilized self-planned learning procedures twice as often as any other method.

10. Older adults are sensitive to life's changes and are motivated to update their education and develop new skills and knowledge.

Implications

1. The results of this study indicate that much learning is continued past retirement and that all learning is not focused on self; twenty-seven of 441 learning projects related to the needs of the community. Churches, service organizations, agencies and other community groups should investigate ways to appeal to the older adult to participate in worthy community efforts.
2. Churches have great opportunities for stimulating the older adult to continue to pursue learning. The training of ministers and church staff should include special preparation for dealing with the unique characteristics of older adults.

3. Research has indicated the level of education influences the amount of continued learning initiated by older adults; therefore, programs designed to keep young adults in school may have long range benefits for productive living during retirement.

4. The retired educators of this study planned the majority of their learning efforts; however, efforts by adult educators to provide learning materials and resources should enhance that learning.

Recommendations

On the basis of the findings and conclusions of this study, the following recommendations are made.

1. This research focused on the continued efforts to learn by retired educators, ages 55-71. Continued research is needed to study older adults having served other professions and/or homemaker duties and to study the learning patterns of individuals older than 71 years.

2. Since no Mexican-Americans were included in this study, further research is needed to study the continued learning of older Mexican-Americans.
3. This research focused on the quantity of learning projects, but future research is needed to appraise the quality of self-planned learning.

4. Research is needed to provide information about the effects of imposing a 180 hour maximum on the estimation of the total number of hours spent in learning during the past twelve months, which has been the procedure by researchers using the Tough's (5) Interview Schedule for Studying Some Basic Characteristics of Learning Projects.

5. Many churches have invested in elaborate facilities providing recreation and exercise equipment for family participation. This study indicates that older adults spend time participating in church activities. Research needs to be conducted surveying these facilities to determine if the needs of the older adult are being considered prior to the construction of such facilities.

6. This research indicated that many retired educators feel a pressure called survival. Further study should be conducted defining this feeling and examining the implications for society.

7. Research is needed to study the association of underweight conditions with efforts to continue learning.
CHAPTER BIBLIOGRAPHY


APPENDIX A
October 31, 1983

To Whom It May Concern:

Anne Simmons, a doctoral student in Adult/Continuing Education, has received the approval of Adult/Continuing Education to conduct a study of the relationship of selected health characteristics on participation in learning projects by retired educators.

Your help and assistance in studying these issues would be greatly appreciated and would add to our knowledge of any relationship between health characteristics and learning projects of retired professional educators that may exist.

If you have questions, please contact me at the above address.

Sincerely,

Ron Newsom
Research Advisor
Adult/Continuing Education

Anne Simmons
Doctoral candidate
Adult/Continuing Education
October 31, 1983

Dear Retired Educator:

I am a doctoral student at North Texas State University and I am conducting research pertaining to the learning efforts of retired educators. This includes all efforts to learn, informal as well as formal learning experiences.

I am writing to you to ask your help. I would like for you to contribute information for my study by filling in the attached questionnaire and returning it to me in the enclosed stamped envelope. Research similar to this study has been conducted with groups of professional people, such as ministers, engineers, pharmacists and secondary school teachers. No study has examined the learning projects initiated by retired educators, and I am interested in compiling this information. The results of my study could reveal knowledge about methods and procedures for facilitating the continuing education of older adults.

I appreciate your time and interest.

Very sincerely yours,

Anne Simmons
Doctoral Student
Adult/Continuing Education
North Texas State University
Denton, Texas
RETIRED EDUCATORS LEARNING PROJECTS AND PHYSICAL CHARACTERISTICS

Formal Education: Bachelor    Master    Doctorate    Other    Date of Retirement: ____________

Subjects taught: ____________________________________________________________

Number of Years Taught: _______ Predominate Subject and Grade Level:

Organizations in which you are a member: ______________________________________

Leisure Activities: (ex., bowling) Date of Birth ______ Height ______ Weight ______ Frame

Sex: F  M    Birth ______ Height ______ Weight ______ Size: sm    med    lg

Marital Status: Married    Married/Widowed    Single    Divorced/Separated

Race: Anglo    Black    Mexican-American    Other

Approximate number of visits to the library for reading and study during the past month: ________

Approximate number of books read during the past month: ________

Magazine Subscriptions: ___________________________________________________________

Television programs you like to watch: ____________________________________________

Brief list of formal and/or informal courses (schools, churches, community center, etc.) that you have participated in during the past month

A few respondents are needed to contribute more details about their learning activities. It is not necessary for you to have been enrolled in any organized or formal courses. I am interested in all activities that you do for the purpose of learning new skills or knowledges or to bring about a change in your life.

If you will permit me the privilege of contacting you for the purpose of gathering the remaining data that is needed, please complete the following:

Name ____________________________ Phone (_____) ________ a.c.

Address ____________________________ street or F.O. Box ________ city ________ zip

Best time for telephone contact: ____________________________________________
APPENDIX B
(Introduce yourself. Say, I'm helping conduct research for the purpose of discovering ways to serve better the retired people in Texas. Our research is about people and the sorts of things they learn and the association of selected health characteristics.)

I'm interested in discovering all of the things that you do during one year that could be considered physical activity and the things you do that indicate a desire to learn.

Note: The interviewer will record only on the worksheet (Page 4) the list of activities cited by the subject; then record the number of hours of participation for a typical week for each of the four seasons. Some activities will not be included, as they represent only occasional periods of exercise. I will devise a formula to include these if they represent a substantial amount of time.

The total number of hours per week for all four weeks will be averaged and will represent the final estimated number of minutes of participation in exercise per week.

<table>
<thead>
<tr>
<th>WEEKLY TIME ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
</tr>
<tr>
<td>1 &amp; 1/4 hr</td>
</tr>
<tr>
<td>2 &amp; 1/4 hr</td>
</tr>
<tr>
<td>3 &amp; 1/4 hr</td>
</tr>
<tr>
<td>more than 4 hours</td>
</tr>
</tbody>
</table>
The following questions will be about your daily exercise practices. When I say exercise I mean all of the work and recreation that you do which is vigorous enough to cause you to perspire or to increase your heart beat.

Do you intentionally try to exercise? Yes No

1-2 Sessions 3-4 Sessions More

If so, do you exercise enough to begin to perspire:

Just a little Moderate Quite a bit

How much do you increase your heart beat?

Just a little

Until you feel breathless

Until you are out of breath

Many activities cause you to perspire or to increase your heart beat. I have a list of some activities which can be considered exercise because they are vigorous enough to increase your heart beat. It may remind you of other things that you do that can be considered as exercise. Take as long as you want to read each word, and to think about all of the things you do during each week of the year. (Give him/her the reminder sheet, or read it aloud if necessary.)

OK, that gives us a fairly complete list. If you suddenly think of something else you do, though, please tell me.

Now, we need to estimate the amount of time you have spent in each of the activities you identified. Think about each one and indicate the ones you think you have participated in six or more times during the past year.

From the ones you have participated in six or more times we need to estimate the number of hours you believe you spent doing each activity during the last year. Of course you cannot remember exactly how many hours, so just give your best guess. If you wish, just choose the closest number from the attached list.

Let us think about a typical week in the fall. List the activities from the list that you would likely participate in during one week. (Do an estimate for the winter; spring; and summer.)

Try to estimate the amount of hours spent during that week participating in each activity.
EXERCISE AND OTHER PHYSICAL ACTIVITIES
(Reminder Sheet)

1. Personal Care
   - Conditioning; Calisthenics; Cycling
   - Running; Jogging; Aerobic exercise
   - Survival; Self-Defense Training

2. Recreation: Games, Sports, Dance, Music, and Hobbies
   - Archery; Frisbee
   - Baseball; Softball
   - Basketball
   - Billiards; Croquet; Shuffleboard
   - Bowling
   - Canoeing; Rowing
   - Cycling
   - Dancing
   - Fishing
   - Football
   - Golf (walking)
   - Gymnastics
   - Horseback Riding
   - Horseshoes; Washer Pitching
   - Hunting
   - Marching in or with a band
   - Music; Organs; Drums; Wind instrument
   - Pottery; Sculpture
   - Racket Sports
   - Skiing; Snowshoeing; Skating
   - Swimming
   - Volleyball
   - Walking; Hiking

3. Housework
   - Baking; Cooking; Canning
   - Climbing Stairs: Home; Work; Other
   - Food Shopping; Other Shopping
   - Housework: Cleaning; Ironing; Mopping; Sweeping
   - Painting: Walls; Ceilings
   - Plastering; Tetone Walls
   - Wall Papering
   - Window Cleaning

4. Labor
   - Automobile Maintenance: Repair; Cleaning
   - Carpentry
   - Digging
   - Electrical Work
   - Farming: Building Fences; Flowing; Haying
   - Forestry: Chopping; Carrying Logs; Sawing by Hand;
   - Trimming Trees
   - Welding; Other Machine Operations

5. Yard; Garden
   - Gardening: Digging; Hedging; Mowing; Planting; Raking

6. Animal Care
   - Animal Grooming: Dogs; Horses; Cats
   - Cattle

7. Other
Now I'm interested in listing the things you have tried to learn during the past year. When I say "learn" I don't just mean learning the sorts of things that people learn in schools and colleges. I mean any sort of deliberate effort at all to learn something, or to learn how to do something. Perhaps you tried to get some information or knowledge—or to gain new skills or improve your old ones—or to increase your sensitivity or understanding or appreciation. Can you think of any efforts like this that you have made during the past 12 months?

Try to think back over all of the past 12 months—right back to _______ of last year. I am interested in any deliberate effort you made to learn anything at all. Anything at all can be included, regardless of whether it was easy or hard, big or little, important or trivial, serious or fun, highbrow or lowbrow.

(P) It doesn't matter when your effort started, as long as you have spent at least a few hours at it sometime since last ______ (month).

(P) We want to get as complete a list as possible, because we think that people make far more attempts to learn than anyone realizes. We can include any sort of information—skill—or understanding at all that you have tried to gain—just as long as you spent at least a few hours at it sometime during the past 12 months.

(P) Can you recall any other efforts to learn that were related to your home or your family? Anything related to your hobbies or recreation? Your job? Your responsibilities in various organization, or clubs, or in a church or synagogue, or on a committee, or some other responsibilities? Anything related to some teaching, writing, or research that you do outside of your job?

(P) Going back over the past 12 months, can you recall any other times that you tried to learn something by reading a book? When you read newspapers or magazines, do you read certain topics or section because you want to remember the content? Have you tried to learn anything else from booklets, pamphlets, or brochures? From memos, letters, instructions, or plans? From technical or professional literature? From an encyclopedia or other reference work?
(P) Have you learned anything at all from a medical doctor? From a lawyer? From a counselor or therapist? From a financial or tax advisor? From a social worker? From a private teacher? From a specialist or expert? From individual private lessons?

(P) Have you learned anything from documentaries or courses on television? From TV news or some other TV programs? From radio? In a theatre? Have you tried to learn from conversations? Or from asking questions: that is, have there been any topics or areas that you have tried to learn about from your friends or other people? Have you deliberately sought to learn by seeking out stimulating individuals? Have you tried to learn anything from your spouse or other relatives? From a neighbor?

(P) Perhaps you have learned something in some group or other? Perhaps in some meeting or discussion group? From attending a conference? From a retreat or weekend meeting? From an institute or short course or workshop? From a committee or staff meeting? From taking a course? From attending evening classes or lectures, or a speech? From a correspondence course? From attending a club or group meeting?

(P) Perhaps tape recordings or phonograph records or "A language lab" helped you learn something during the past year? Have you learned in a church or synagogue? In a college, university, or school? In some community organization? In a company or factory or office? In a government program? In an exhibition, museum, or art gallery? In some vacation spot?

Now I have a list of some of the things people learn (sheet one). It may remind you of other things that you have tried to learn during the past 12 months. Take as long as you want to read each word, and to think about whether you have tried to learn something similar. (Give him or her the sheet, or read it aloud if necessary.)

OK, that gives us a fairly complete list. If you suddenly think of something else you have learned, though, please tell me.
Now I want to find out a bit more about each of your efforts to learn. Let's begin with the first one on the list. It was your efforts to learn ______. Here is a sheet that will help us learn more about your efforts and estimate the number of hours spent at planning and preparing for that learning. (Hand him or her the second sheet.)

(If possible, pin down and record just what the learning segments were. For example, you could ask, "How did you go about learning this? How was it learned? What did you do? Was there anything else you did to learn ______?"

Examples that you might record to help understand the total effort are: Watched an expert, listened to a recording, read, practiced, attended a meeting, etc. This list of activities is primarily for your benefit in helping the person estimate his or her time accurately; we do not need the data for any specific purpose other than it might help you later determine the subject matter source. In other words, don't make any special effort to get it or to record it carefully, but on the other hand don't discard it either.

(Ask for a time estimate in total number of hours. If the number of hours is below 14, check two criteria. First, "Within some six-month period during the past year, did you spend at least five hours at the learning itself—that is, at the ______ learning effort." Second, "Within some six-month period or shorter period during the past year, did you spend at least seven hours altogether on the learning effort?" If both criteria are met write yes and proceed; if both are not met write no and move to the next learning project.)

(Ask them to select whether they have been active or not active.)

(Determine their reason for undertaking the project. Ask, "in any of your efforts on the learning endeavor, was credit any part of your motivation? That is, did you hope to use any of your learning efforts for academic credit—toward some degree, certificate, diploma, or passing a test, examination, or course—or toward some license or a driving test? (Pause) Or was it toward some requirement or examination or upgrading related to a job? (Pause) Or did you undertake the learning activity for your own enjoyment of self-improvement?" NOTE: You will need to determine the primary reason.)

Now we are going to think about your learning effort and try to decide who or what was the director or leader. That is, who decided what you would learn—and how you would learn—whenever you spent some time trying to learn? Here is a sheet explaining what I mean (sheet three). (If no one resource was primarily (51%) responsible, classify it as mixed. If he or she does not seem to understand, or if you feel doubtful about the response, ask who the particular
director or leader was. If you anticipate difficulty or if the learner asks, say that we are interested in who the leader was for the past 12 months rather than earlier.

(Finally, determine the major source of subject matter. That is, what resource provided most of the content—a book, a pro ski instructor, a discussion group, a television broadcast, etc.)

(Repeat for each learning project, recording the appropriate data.)

That completes the interview. Thank you very much for your time and assistance. I think your efforts will help to make education more meaningful in the lives of many adults.

Learning Project Record

ID _______________

Desired Knowledge or Skill

Episodes:

Number of Hours: ______ (Criteria Check: M R 6 mo)

Current Status: _______ Active _______ Not Active

Reason for Project:

Directors of Learning:

Source of Subject Matter:

Criteria Check:

1. Deliberate learning
2. Retention-2 days
3. time invested=7 or more hours

a. In this activity was your desire to gain certain definite knowledge and skill and to retain it for at least two days, stronger than all your other purposes put together?

or: During this learning project, how long did you want to retain what you were learning?

b. Within some six-month period or other during the past year, did you spend at least seven hours altogether?
Some things that people learn about

1. A sport or game; swimming; dancing; bridge
2. Current events; public affairs; politics; peace; biography
3. Sewing; cooking; homemaking; entertaining
4. Driving a car
5. Home repairs; woodworking; home improvement project; decorating and furniture
6. A hobby or craft; collecting something; photography
7. Raising a child; discipline; infant care; child's education
8. Nature; agriculture; birds
9. Mathematics; statistics; arithmetic
10. Speed reading; effective writing; public speaking; vocabulary; literature
11. Science; astronomy; man in space
12. Health; physical fitness; posture; clothes; appearance
13. History; geography; travel; some region, city, or neighborhood
14. Personal finances; savings; insurance; investing; purchasing something
15. Psychology; effective relationships with people; groups; leadership; social skills
16. Typing; data processing; mechanical skill
17. Some personal problem; mental health; an emotional problem; an illness or medical condition
18. Various careers; choosing an occupation; finding a job
19. Gardening; landscaping
20. Something related to a job or responsibility or decision
21. Musical instrument; singing; music appreciation
22. Professional or technical competence; sales skills; how to teach or supervise
23. Some aspect of religion; ethics; philosophy; moral behavior
24. Current changes in society; the future; problems in cities; pollution; sociology
25. Relationship with the opposite sex; manners; marriage; relationships within the family
26. Art; painting; architecture; the opera; movies; television
27. Business management; economics; business
28. Sensory awareness; human potential; communication; understanding oneself; efficiency
29. New techniques; new way of doing something; an innovation
30. Spanish; French; some other language

Sheet one
1. We need your best guess about the total amount of time that you spent at all aspects of this particular learning effort during the past 12 months. Please include the time you spent reading—listening—observing—or learning in some other way—if your main purpose during that activity was to gain and retain certain knowledge or skill. In other words, we will include all the times during which at least half of your total motivation was to gain certain knowledge or skill, and to retain it until at least two days later.

In addition to the time you spent at the actual learning itself, please include all the hours that you spent, during the past 12 months, at deciding about the learning, planning the learning, and preparing and arranging for it. This can include any time spent at deciding whether to proceed with the learning—deciding what to learn—deciding how to learn—deciding where to get help—seeking advice about these decisions (from other people or from printed materials)—traveling to some of the learning activities, such as a meeting or practice session or library—arranging appropriate conditions for learning—choosing the right book or person for the actual learning—obtaining that book or reaching that person.

Of course, you cannot remember exactly how many hours, so just give your best guess. If you wish, just choose the closest number from the following list:

1 3 6 10 20 40 70 100 140 180 more

2. Which of these following two answers best describes this particular learning effort at the present time:

(A) NOT VERY ACTIVE—that is, you have dropped it or completed it, or you have set it aside for a while (or you are spending much less time at it now than you were before).

OR

(B) DEFINITELY ACTIVE—that is, you are definitely continuing this learning effort right now, and you are spending about as much time as ever at it.
There are four different sorts of learning efforts, according to who directs them. That is, a person's efforts to learn can be classified according to who was responsible for the day-to-day planning. We have to look at who planned or decided exactly what and how the person should learn at each session. For example, who decided what the person should read or hear, or what else he or she should do in order to learn?

1. **Group-planned learning**

In some learning projects, you may decide to attend a group and let the group (or its leader or instructor) decide what and how you learn during each session. A group may be of any size, with a minimum of five persons. Examples might be lectures, study groups, workshops, small informal groups, or conferences.

2. **One-to-one learning**

In some learning projects, the planning and deciding of what to learn and in what order is handled by one person, who helps the learner in a one-to-one situation. That is, there is one helper (or instructor, teacher, expert, or friend) and there is one learner. These two persons interact usually face-to-face, although it could be by telephone or by correspondence. Even if 2-4 learners were receiving individualized attention from one other person at the same time, it would be included here.

3. **Material Resource learning**

In these learning projects, the major part of the detailed direction on what to learn and what to do at each session resides in some material resource, object, or non-human resource. A programmed instruction book, a set of tape recordings, or a series of TV programs are examples. The learner follows the programs or materials and they tell him or her what to do next.

4. **Self-planned learning**

In other learning projects, the learner him or herself retains the major responsibility for the day-to-day planning and decision-making. He may get advice from various people and use a variety of materials and resources, but he retains the responsibility for deciding what activities to try next, what to read, and what skill or knowledge should be next in the sequence. Instead of turning the job of planning over to someone else, he makes the day-to-day decisions alone.
APPENDIX C
# Retired Educators Learning Projects and Physical Characteristics

(A nine "9" always equals no response or answer)

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<td>Number of Years Taught</td>
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<td>Grade Level</td>
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<td>Predominate Subject Taught</td>
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1=Elementary Classroom

2=Elementary Specialist: Music, Art, Physical Education, Remedial.

3=Secondary Classroom

4=Secondary Specialist: Music, Art, Physical Education, Remedial, Coach, Journalism, Other.

5=Administration: Principal, Consultant, Superintendent, Other.

6=Other
2. Exercise and Physical Characteristics

Intentially try to exercise:  
1=Yes  2=No  

Number of times per week:  
1=1-2 times  2=3-4 times  3=5 or more  

Length of each workout:  
1=Less than 30 min.  2=More than 30 min.  

Do you exercise enough to perspire:  
1=Yes  2=No  

How much do you perspire:  
1=Just a little  2=Moderate  3=Heavy  

Heart rate increase:  
1=Just a little  2=Until breathing hard  3=Until out of breath  

Number of exercise activities: Actual Number  

Average number of hours of exercise per week:  

Predominate type of exercise:  

1. Physical care; conditioning; survival  
2. Games, sports, dance, hobbies; music; recreation  
3. Housework; maintenance; cleaning; shopping; stair climbing; cooking  
4. Labor: car maintenance, carpentry, welding, forestry, farming  
5. Animal care  
6. Yard, garden  
7. Other
## Learning projects information

### Learning projects #1:

- **a. Estimated number of hours/project**

- **b. How active**
  - 1 = Not very active now
  - 2 = Definitely active now

- **c. Primary reason**
  - 1 = Credit
  - 2 = Exam, test
  - 3 = Job
  - 4 = Enjoyment
  - 5 = Learning
  - 6 = Challenge
  - 7 = Mixed

- **d. Primary director of learning**
  - 1 = Group
  - 2 = One-to-one
  - 3 = Material resource
  - 4 = Self-planned
  - 5 = Mixed

- **e. Source of subject matter**
  - 1 = Group, group instruction
  - 2 = Friend, relative, neighbor
  - 3 = Expert
  - 4 = Books, pamphlets, newspaper
  - 5 = Programmed materials
  - 6 = TV, radio, recordings, cassettes
  - 7 = Displays, exhibits, museums, galleries
  - 8 = Mixed

### Table 1:

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**EXERCISE: ESTIMATE OF HOURS PER WEEK**

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<th>Sum</th>
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<td>Physical Care</td>
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<td>Survival; Self-Defense Training</td>
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<td>Archery; Frisbee</td>
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<td>Baseball; Softball</td>
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<td>Basketball</td>
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<td>Billiards; Croquet; Shuffleboard</td>
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<td>Bowling</td>
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<td>Canoeing; Rowing</td>
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<td>Golf (walking)</td>
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<td>Gymnastics</td>
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<td>Horseback Riding</td>
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<td>Marching in or with a band</td>
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<td>Pottery; Sculpture</td>
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<td>Racket Sports</td>
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<td>Walking; Hiking</td>
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<td>3.</td>
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<td>Baking; Cooking; Canning</td>
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<td></td>
<td>Climbing Stairs: Home; Work; Other</td>
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<td></td>
<td>Food Shopping; Other shopping</td>
<td></td>
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<td></td>
<td>Housework: Cleaning; Ironing; Mopping; Sweeping</td>
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<tr>
<td></td>
<td>Painting; Walls; Ceilings</td>
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<td></td>
<td>Plastering; Textone Walls</td>
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<td></td>
<td>Wall Papering</td>
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<td></td>
<td>Window Cleaning</td>
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<td>4.</td>
<td>Labor</td>
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<td>Automobile Maintenance: Repair; Cleaning Carpentry</td>
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<td></td>
<td>Digging</td>
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<td></td>
<td>Electrical Work</td>
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<td></td>
<td>Farming: Building Fences; Plowing; Haying Forestry: Chopping; Carrying Logs; Sawing; by Hand; Trimming Trees Welding; Other Machine Operations</td>
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<td>5.</td>
<td>Yard; Garden</td>
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<td>Gardening: Digging; Hedging; Mowing; Planting; Raking</td>
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<td>6.</td>
<td>Animal Care</td>
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<td>Animal Grooming: Dogs; Horses; Cats</td>
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<td></td>
<td>Cattle</td>
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<td>7.</td>
<td>Other</td>
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</table>

Total hours: 

Average hours per week: ___
HUMAN CONSENT FORM

Date __________________________

I understand that this is a study of the association between selected health characteristics and participation in learning projects (continuing education) by retired educators. The data will be obtained through a personal interview which will last from one to two hours.

If I decide to volunteer for this experiment, I may withdraw my consent at any time and discontinue my participation in this study. If I withdraw my consent after completing part of this study, there will be no penalty for withdrawal.

I understand that I will be asked to answer questions and the interviewer will record in writing the answers that I give. I will be given the choice of the location of the interview. I may choose to meet with the interviewer in my home; at the public library; or seated inside the interviewer's van. If at any time I wish to inquire about the procedures of the study, I will be free to ask and my questions will be answered by the interviewer.

The information which is obtained will be treated as privileged and confidential and will not be released or revealed to any person without my expressed written consent. The information obtained, however, may be used for statistical or scientific purpose with my right of privacy retained.

This research is under the supervision of Anne Simmons and Dr. Ron Newsom. Mrs. Simmons's phone is (817) 261-0663 and Dr. Newsom's phone is (817) 565-2722. Please feel free to contact Mrs. Simmons or Dr. Newsom if you have any questions.

I have read the foregoing and I understand it and any questions which may have occurred to me have been answered to my satisfaction. I hereby willingly consent to be enrolled in this study.

DATE __________________________ SIGNED __________________________
TIME __________________________ a.m. WITNESS __________________________
TIME __________________________ p.m.
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