

A STUDY OF LEARNING MODALITY ELEMENTS OF
THE OKLAHOMA ASSOCIATION OF YOUTH
SERVICES MEMBERS

By

LINDA SUE RICE

||

Bachelor of Science in Criminal Justice
American Technological University
Killeen, Texas
1976

Master of Criminal Justice
American Technological University
Killeen, Texas
1977

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
May, 1984

Thesis
1984D
R4965
cap. 2



A STUDY OF LEARNING MODALITY ELEMENTS OF
THE OKLAHOMA ASSOCIATION OF YOUTH
SERVICES MEMBERS

Thesis Approved:

Wayne B. James

Thesis Adviser

John Henry Smith

Leroy L. Davis

Norman D. Dunbar

Dean of the Graduate College

ACKNOWLEDGMENTS

There are many individuals who supported this writer in the completion of this project. Many thanks to those who encouraged and assisted in making a dream a reality.

Special "thanks" to the members of the Doctoral committee: Dr. Wayne B. James, Dr. Bob Helm, Dr. Jerry G. Davis and Dr. Gene Smith for their guidance throughout this process. A very special appreciation is extended to the chairperson of the committee, Dr. Wayne B. James for the continued encouragement, advice, and direction provided to this writer.

Sincere gratitude to the Board of Directors of Youth and Family Services of Canadian Co., Inc. for their patience, understanding and encouragement for this writer's endeavors. Also, for their support in terms of allowing flexibility and monthly board meeting changes to coincide with the writer's class schedules.

Special appreciation is due to the writer's staff for their endurance and support during the past two years of this process. I give special thanks to Tena Wilson, Geneille Drumm, and Sue Moore for participating and helping in the different phases of the project.

Appreciation is, also, extended to the Oklahoma Association of Youth Services and the member agencies who participated in the project.

Lastly, to my son, Dennis Lee Rice II, whom I love very much and who has been extremely patient and understanding during my absence through his formative years. You always have been my reason to attain this goal.

PREFACE

Much of this study was conducted with the cooperation of six graduate students under the counsel of Dr. Wayne B. James, Associate Professor in the School of Occupational and Adult Education. The others were Jack Akins, Bill Brown, Walt Lucus Jr., Joe Nix, and Evelyn Stewart. The studies were conducted under close counsel of Dr. Russell L. French, University of Tennessee Professor in the Department of Curriculum and Instruction and Dr. Clarence Cherry, Jr., Air National Guard Instructor, Knoxville, Tennessee.

Parts of this study may be similar to the others due to the close relationships of the group during the preparation for the research and the collection of data.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	4
Purpose of the Study	4
Significance of the Study	5
Assumptions of the Study.	6
Scope and Limitations of the Study.	6
Definition of Terms	6
Organization of the Study	8
II. REVIEW OF LITERATURE	9
Introduction	9
Individual Learning Style Differences	12
Learning Style Elements and Modalities	15
Measurement of Learning Style Elements	19
Results of Findings	20
Summary	22
III. METHOD AND PROCEDURE	23
Population and Selection.	23
Instrumentation	24
Design and Test Procedures for MMPALT II	25
Print	25
Aural	25
Visual	26
Haptic	26
Interactive	26
Kinesthetic	27
Olfactory	27
Test Procedures for the PMPS	27
Collection of Data	28
Data Analysis	29
IV. ANALYSIS OF DATA	30
Demographic Data	30
Results of MMPALT II.	32
Results of PMPS	32
Correlation of MMPALT II and PMPS	36
Differences of Subgroups.	36
Sex	36

Chapter	Page
Age	42
Marital Status	42
Education.	42
Smoking.	42
Observations of Researcher.	49
V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.	52
Summary	52
Conclusions	53
Recommendations	54
BIBLIOGRAPHY	56
APPENDIXES	60
APPENDIX A - PROCEDURES FOR MMPALT II	61
APPENDIX B - PERCEPTUAL MODALITY PREFERENCE SURVEY	78
APPENDIX C - PERMISSION TO USE MMPALT II AND PMPS	82
APPENDIX D - INTRODUCTION TO THE LEARNING STYLES MEASUREMENT EXERCISES	84
APPENDIX E - DEMOGRAPHIC FORM	86
APPENDIX F - RESPONSE SHEETS FOR MMPALT II	88
APPENDIX G - INTRODUCTION FOR THE PMPS SURVEY	93
APPENDIX H - WORKSHEET FOR HAND-SCORING PERCEPTUAL MODALITY SURVEY	95
APPENDIX I - SIGN-UP SHEET	97
APPENDIX J - SUMMARY OF DEMOGRAPHIC DATA	99
APPENDIX K - SUMMARY OF INDIVIDUAL RANKS AND SCORES FOR THE MMPALT II AND THE PMPS SURVEY	106

LIST OF TABLES

Table	Page
I. Demographic Data	31
II. Summation of MMPALT II Element Scores	33
III. Summation of Learning Style Strengths Demonstrated by MMPALT II Rankings	34
IV. Summary of PMPs Scores	35
V. Summation of Learning Style Strengths Demonstrated by PMPs Rankings	37
VI. Results of t Tests on MMPALT II Element Scores by Sex. . . .	40
VII. Results of t Tests on PMPs Element Scores by Sex	41
VIII. Results of ANOVA Tests on MMPALT II Element Scores by Age. .	43
IX. Results of ANOVA Tests on PMPs Element Scores by Age	44
X. Results of t Tests on MMPALT II Element Scores by Marital Status	45
XI. Results of t Tests on PMPs Element Scores by Marital Status	46
XII. Results of ANOVA Tests on MMPALT II Element Scores by Education	47
XIII. Results of ANOVA Tests on PMPs Element Scores by Education	48
XIV. Results of t Tests on MMPALT II Element Scores by Smoking. .	50
XV. Results of t Tests on PMPs Element Scores by Smoking	51

LIST OF FIGURES

Figure	Page
1. Relationship Between Learning and Thinking in the Perceptual Process	16
2. Gilley's Rank Order Findings	20
3. Bartz's Correlation Strength Categories	29
4. Correlation of MMPALT II Element Scores with the Correspondent PMPS Elements	38
5. Correlation of MMPALT II Element Scores with the Correspondent PMPS Elements	39

CHAPTER I

INTRODUCTION

It is estimated that four out of five individuals in America are involved in some sort of learning process (Cherry, 1981). Penland (1978) stated that adult learners are entering and re-entering a variety of programs from all educational backgrounds and all social, economic, and occupational levels. He has, also, reported these adult learners have individualistic learning patterns, and they prefer to control the pace and character of their own learning. According to Cherry (1981), educators and administrators in adult programs are challenged to provide the assistance to adult learners to individualize their own learning processes or experiences. Therefore, adult education should provide skills and tools for the identification of individual differences in adult learners.

A variety of models have been developed to identify and measure individual differences. However, there is a conflict among adult educators with psychological backgrounds and adult educators with classroom backgrounds. Foundations in psychology tend to focus on internal neural processes (Martens, 1975). Adult educators with foundations in the classroom tend to focus on the learning environment and the students' interactions with stimuli (Cherry, 1981). This process has provided a basis to question learning styles differences among individuals.

Assumptions underlying an andragogical approach to adult learning helps to define the unique qualities of the adult learner. Knowles (1978) states that as independent and self-directed beings, most adults are capable of assisting in the planning, execution and evaluation of their own learning experiences. The orientation and readiness to learn for adults are the function of a developmental context different from that of children. To a large extent, performing the roles and tasks inherent in adulthood determines what is to be learned. Application of the learned information is immediate as opposed to projected future use. The necessity of dealing with the challenges inherent in adult living can form the basis for many adult education programs (Knowles, 1978).

Attempts at identifying and measuring individual learning differences, through a psychological basis, have focused on the concept of development. Neugarten and Datan (1973) present the essence of developmental psychology:

. . . to study sequences of change for the purpose of determining which ones are primarily developmental (in the sense of being tied to maturational changes) and which ones are primarily situational if indeed, this distinction can be made at all (p. 57).

Developmental psychologists attempt to determine the commonalities that exist for all human beings moving through the life cycle, while, at the same time, keeping sight of the uniqueness of each individual in his or her responses to life's events or tasks. "The developmental approach also considers the adult as a learning organism, for the intellectual or cognitive dimension of adulthood" (Darkenwald and Merriam, 1982, p. 89). Attention has been focused on classroom environment and activities by practicing educators.

According to Dewey (1938), experience, democracy, continuity, and

interaction are the four key concepts for the basis in learning.

Experience provides for all genuine education. Dewey (1938) states:

A primary responsibility of educators is that they not only be aware of the general principles of the shaping of actual experience by envisioning conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have to contribute to building up experiences that are worthwhile (p. 35).

Dunn and Dunn (1978) have included environmental stimuli, motivation, and social interaction in the process of learning. Hill (1976), however, divided the learning processes into perceptual or sensory categories of: auditory, olfactory, savory, tactile, and visual. Measurement of these elements are taken through self-report or teaching assessment opinion survey. The results are used to adjust the classroom teaching practice. The self-assessment or survey approach has not been scientifically validated.

Concerns have been expressed by both practical educators and psychological researchers in the area of the individual differences. For example, French (1975) conceptualized seven perceptual learning styles: print, aural, interactive, visual, haptic, kinesthetic, and olfactory. Those seven are referred to as perceptual modality elements of individual learning style, and they serve as a foundation for this study's examination of individual learning differences (Cherry, 1981).

Early studies by Lindeman (1926), Thorndike (1932), and Dewey (1938) suggested that individual differences need to be assessed in order for the individual to process the information and learn. Later studies by Gagne (1968), Wepman (1974), Scarborough (1976), and Ingram (1974) concluded that the theory of learning styles measurement and the teaching of measured learning styles is a valid concept.

In his dissertation, Cherry (1981, p. 109) concluded that "research with adults should be extended to a much larger population." The limited numbers and types of subjects in his study precluded generalization to adults or to other specific groups.

Statement of the Problem

Members of the Oklahoma Association of Youth Services (OAYS) are trained to provide individual group and family counseling to troubled youths and their families. OAYS members have never participated in a formal study to determine learning styles, therefore, there is a lack of information concerning learning styles in this population. With this information, there seems to be a need for knowledge to interpret the differences among the OAYS members. Also, the determination of the OAYS members preferred learning styles will enhance their design of individual, group, and family processes.

Purpose of the Study

The purpose of the study was to measure the individual learning styles using the MMPALT II on a specific adult population, the Oklahoma Association of Youth Services (OAYS) members. This adult population was selected to provide a larger data base to the Cherry (1981) study.

The research questions investigated in the study include:

1. What are the preferred learning styles of the Oklahoma Association of Youth Services members (Enid, Norman, El Reno, Shawnee) as measured by Multi-Modal Paired Associates Learning Test II (MMPALT II)?
2. Is there a correlation between the results of the OAYS members

MMPALT II learning styles and the perceived learning styles as measured by the Perceptual Modality Preference Survey (PMPS)?

3. Are there significant differences in the learning style measurement by sex in this sample?

4. Are there significant differences in this sample by age, education, marital status, and smoking?

Significance of the Study

Traditional educational experiences tend to provide for a mass production of classroom routines for all learners; however, learning is a unique process for each individual and requires a focus on partial individualized approaches. In order, to deviate from traditional approaches and to provide for each individual's uniqueness, there is a need for knowledge to interpret the differences of those learners. Tough (1979) stated adult learning is an individual activity and is accomplished best when it is self-planned. Knowles (1978) presented an andragogical model for adult learning and contrasted it with pedagogy, which is a traditional approach to learning. Knowles (1980) stressed that traditionalists charge full responsibility of the learning process to the teacher. However, nontraditionalists such as Knowles (1980) tend to place emphasis on self-directed learning. He identifies the andragogical model as the art and science of helping adults learn.

This study expanded the data base to a specific adult population. This expanded data can be used to increase awareness of individual learning styles and promote individualization in the learning process.

Assumptions of the Study

The basic assumptions of this study include the following:

1. The MMPALT II is a valid system for objectively measuring individual differences in perceptual modality elements of learning styles.
2. Response to the PMPS reflects each individual's subjective opinion of his own perceptual modality of learning style.
3. This study focused on measurements of the individual's learning styles of volunteer subjects and, therefore, does not distort or damage the findings.

Scope and Limitations of the Study

The following limitations apply to this study:

1. The population to be sampled was restricted to the membership of 38 agencies with the Oklahoma Association of Youth Services (OAYS).
2. The study population was limited to 40 adults who volunteered to have their perceptual learning styles measured.
3. The MMPALT II used a paired associates testing procedure. This procedure measures one's ability to remember and/or discriminate among information presented within a particular framework, and may not measure all factors which make up one's perceptual learning style.

Definition of Terms

The following terms were used in this study:

Administrator (Director): Individuals with the ultimate administrative and managerial control of the agency.

Adult: An individual over the age of eighteen (18) years of age.

Andragogy: The art and science of helping adults learn.

Community Youth Service Counselor (CYSC): An individual (employee) of the youth service agency who provides individual, group, and family counseling as an outreach within the community.

Learner: An individual engaged in or expressing an interest in the acquisition of new skills or knowledge.

Learning Style: Individual differences in relating to or interacting with environment for the purpose of learning.

Oklahoma Association of Youth Services (OAYS): An organization of all youth service agencies within Oklahoma.

Perceptual Modality of Learning Styles: The approach which an individual learner uses in gathering information and knowledge from the world about him or her through the five senses. In this study, the seven perceptual style elements identified by French (1975) and researched by Gilly (1975) and Cherry (1981) are the basis for investigation.

The seven perceptual styles are:

Print (P): Gathering information primarily through the printed word.

Aural (A): Gathering information primarily through listening.

Interactive (I): Gathering information primarily through discussion and talking with other.

Visual (V): Gathering information primarily through seeing pictures, images, objects and activities.

Haptic (H): Gathering information primarily through touching and/or holding.

Kinesthetic (K): Gathering information primarily through the performance of or engaging in body movement.

Olfactory (0): Gathering information primarily through the sense of smell.

Revised Multi-Modal Paired Associates Learning Test (MMPALT II): A seven-set paired associates learning test designed to rank order the perceptual modality strengths and weakness of each subject through objective measurement (Cherry, 1981).

Perceptual Modality Preference Survey (PMPS): A 42-item survey designed to survey each individual's intuitive perception of his perceptual learning style.

Shelter: A form of short-term residential care for children.

Support Personnel: Personnel other than administration or counselors, this includes child care workers, house parents, and others.

Organization of the Study

Chapter I identifies the problem under investigation, states the purpose of study, discusses the importance of the study, outlines the assumptions and limitations of the study, and defines the terms used in this study. Chapter II presents a review of related literature in the areas of individual differences and learning modalities, the elements of learning styles, and the measurement of individual differences. Chapter III details the procedures to be used in the study. It includes sections on selection of subjects, instrumentation, collection of data, and data analysis. Chapter IV provides information or analysis of the findings of the study, with reference to the specific adult population selected. Chapter V summarizes the investigation, discusses the conclusions of the findings, and provides recommendations for practice and further study.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this study was to measure the individual learning styles using the MMPALT II of the Oklahoma Association of Youth Services Members. The review of literature is presented in six areas of information related to the foundation of this study. The areas are:

1. Introduction,
2. Individual learning style differences,
3. Learning style elements and modalities,
4. Measurement of learning style elements,
5. Results of findings,
6. Summary.

Introduction

The field of psychology has provided research in the area of personal learning style. Psychological research tends to focus on the human organism's internal reactions to stimuli and the organism's external reactive behavior.

It was not until the early twentieth century that learning was investigated systematically by Thorndike (1932). He conceived learners to be empty organisms who responded to stimuli more or less randomly and automatically. In his investigation, Thorndike explained learning as a process of association and developed the stimuli-response (S-R) theory of

learning. His laws of learning were major contributions to the psychology of learning. According to Thorndike, learners will acquire and remember those responses that lead to satisfying after effects (law of effect); repetition of a meaningful bond (law of exercise); and readiness of the organism (law of readiness).

The experimental work of Thorndike was further researched by Skinner, as well as other researchers. According to Skinner (1968), behavior is learned and can be modified if certain environmental factors are shaped in a predetermined way. In his experiment, Skinner avoided the mental constructs such as habit, needs, motive, and cognition and instead dealt with the properties of behavior.

Although there are some differences in emphasis on learning theories among behaviorists, the common focal point is in the connection of stimuli and response. Beginning with Thorndike's (1932) experiments, behaviorists have sought to discover general principles that explain learning. Through controlled experiments, they observe an organism's overt behavior and attempt to explain mental contingencies rather than internal causes of action (Hill, 1964).

Goldstein (1978) reporting on the Personal Constructs Theory of Kelly stated that man was not simply a stimulus-response organism who reacts automatically to environment stimuli. Rejecting the implied human quiescence of this model, in which man's natural state is one of inactivity until goaded by stimulus.

By the mid-twentieth century, Gestalt psychologists rivaled the behaviorists in influence on the learning theory (Darkenwald and Merriam 1982). In contrast to the behaviorists, Gestaltists proposed looking at the whole rather than individual parts, and at the total structure of

learning rather than at isolated incidents. Therefore, they believed, by studying a stimuli and a response one does not achieve a full understanding of the incident. Perception of the environment is not an isolated experience, but occurs in relation to the total configuration of the environment. In Gestalt theory, insight and motivation are key elements in learning. Thus, the Gestalists broadened the investigation of learning to include understanding, insight, and problem solving.

According to French (1981) and Cherry (1981), human learners are purposeful actors in the world of learning, not simply reacting to stimuli. Other authorities have addressed the issue of individual differences in the learning process. Educators in most fields recognize the need for diversity of instruction to coincide with individual differences in the learning process. A community college educator, Griffin (1974, p. 76) stated that: "If a community college is truly committed to the idea of individualized learning, it must make a concerted effort to discern the learning style preference of each student".

Bjorkquist (1971), a vocational educator said:

Teachers are increasingly becoming managers of the learning process rather than dispensers of knowledge and are being challenged to individualize their instruction to account for variability (p. 8).

McKenney (as cited in Martens, 1975) believed individuals develop both conscious strategies and unconscious habits for processing information. According to McKenney, communicating with the environment and organizing data provide the essential cognitive process.

Gagne (1965) among other theorists, offers an approach to human learning that has relevance for understanding learners. The major long-term objective of education is "the learner's acquisitions of clear, stable, and organized bodies of knowledge" (p. 33). Gagne also makes the

assumption that "learning is not simply an event that happens naturally; it is an event that happens under certain observable conditions "(p. 2). . . implies that one can bring about learning by manipulating environmental environment".

Individual Learning Style Differences

Minimum consideration was given to the difference in individual learners in early research and theory. Gagne (1965), in his book, The Conditions of Learning, seemed to view learning as a simple relationship between stimulus and response. He wrote, ". . . there is an unvarying relationship between stimulus and response" (p. 8).

Additionally, Gagne (1965) viewed all animals, including human beings, as near equals in learning style. Gagne explains:

First there is a learner, who is a human being, (It would be possible for the learner to be an animal, but that is another story). For the events considered here the most important parts of the learner are his senses, his central nervous system, and his muscles. Events in his environment affect the learner's senses, and start chains of nervous impulses that are organized by his central nervous system, specifically his brain. This nervous activity occurs in certain sequences and patterns that alter the nature of the organizing process itself, and this effect is exhibited as learning. Finally the nervous activity is translated into action that may be observed as the movement of muscles in executing responses of various sorts (p. 6).

Generalizations about learners have led to generalizations about teaching. Gagne suggested that teaching should progress from the simple to the complex because: "The individual learns simple things first, then more and more complex things; while all this is happening, he is also growing older" (p. 175).

Lowenfeld (1945) challenged the generalization theories of learning. He theorized that differences in perception and reaction caused

individuals to exhibit two distinct creativity types. Lowenfeld's studies caused him to believe that "the distinction which is true for creative types can also be made among individuals" (p. 100). He specifically rejected the theory that perception is the same for all learners.

The quotation stated earlier by Gagne (1965) may misrepresent his views and the views of others at that time. In 1967, Gagne edited Learning and Individual Differences, and several times, including 1968, he stated that learning is an individual matter. By 1970, Gagne was seriously questioning earlier learning theories. In his debate of the status of learning research, he said:

As a field of endeavor, research on how human beings learn and remember is a state of great ferment today. Many changes have taken place, and are still taking place, in the conception of what human learning is and how it occurs. Perhaps the most general description that can be made of these changes is that investigators are shifting from what may be called connectionist view of learning to an information processing view. From an older view which held that learning is a matter of establishing connections between stimuli and responses, we are moving rapidly to acceptance of a view that stimuli are processed in quite a number of different ways by the human central nervous system, and that understanding learning is a matter of figuring out how these various processes operate (p. 468).

The underlying principle of that 1970 Phi Delta Kappan article was the relationship of new views as it related to instruction. Gagne's concluding sentences clearly state the need to consider individual differences and to individualize the instructional processes:

In the most general sense, instruction becomes not primarily a matter of communicating something that is to be stored. Instead, it is a matter of stimulating the use of capabilities the learner already has at his disposal, and of making sure he has the requisite capabilities for the present learning task, as well as for many more to come (p. 472).

As previously stated, Gagne views the most important parts of the learner to be his senses, central nervous system, and muscles. Also,

Lowenfeld considers the senses to be an important aspect of individual differences and learning.

The study of the human senses, as related to learning, is in the area of perceptual psychology. At one time, a distinction was made between sensation and perception, perception is now accepted to include sensation:

Early psychologists in the nineteenth century used to make distinctions between what they called "sensation" on the one hand and "perception" on the other. "Sensation" was thought of as some locally and specifically determined procedure in the respective system of the organism, whereas "perception" referred to what was centrally picked up from the "sensory materials." The opinion of the irrelevance of this distinction is nowadays shared by most psychologists. Here the term "perception" will be preferred, despite its ambiguity. Such a term probably makes it easier to consider that alternatives of "objective" or "subjective," or better of "external" and "intenal" determinants of our experienced life space (von Fieandt, 1977, p. 8).

In 1939, Lowenfeld noted this same distinction. He discovered, through simple observations of partially blind art students, that some would use their limited sight and others would not. Lowenfeld, theorized that some individuals were visually oriented, and others were hapically oriented.

Forgus, in his 1966 textbook, Perception, clearly accepts the theories of individual differences and learning styles. He separates the human learner from lower animals, and he identifies perception or extraction of information from the environment as the major difference between learners. Forqus said: "I have decided to place the process of perception within the context of man's general need to adapt to his environment if he is to cope effectively with the demands of life" (p. 1).

According to Forqus (1966), perception, learning, and thinking have traditionally been referred to as the cognitive processes since they all, to some extent, are concerned with the problem of knowledge. "Learning is defined as the process by which this information is acquired through

experience and becomes part of the organization's storage of facts" (p. 2).

Learning Style Elements and Modalities

In review of the literature available on learning styles, there appears to be confusion in terms of the concepts and terminology. For example, "Learning Styles" and "Cognitive Style" are often used interchangeably. In Cherry's dissertation (1981), the term "Learning Styles" was adopted as the most appropriate and logical term. In addition, his group determined there were at least four subordinate or secondary categories under the broad term "Learning Styles." Those secondary levels of the pattern were labeled "Modalities." The four modalities identified by Cherry and his group were: Perceptual, Cognitive, Emotional, and Social. These modalities identifications not only facilitate the organization of all past learning style terminology; they, also, reflect four areas of the human learning activity: (1) information extraction by the senses; (2) mental processing of that information; (3) personal feeling, attitude, and personality states which influence information gathering, knowledge building, and knowledge application; and (4) social sets which enhance or inhibit the learning process for the individual (Cherry, 1981). These concepts are somewhat supported by the Forgas model of learning and thinking.

The relationship between learning and thinking in the perceptual process is diagramed....:

Modifies perception
of stimulus

Modifies organism

Stimulus - - - Organism - - - Learning - - - Thinking

Modifies perception
of stimulus

Modifies organism
through learning

(Forgus, 1966, pp. 3-4).

Figure 1. Relationship Between Learning and Thinking in the Perceptual Process

By recognizing that learning and thinking involve emotion and social activity, the elements of Forgus's model can be closely related to the four modalities listed in the hierarchy.

A variety of style elements have theorized and investigated by a variety of authors. Oen (1973) reviewed the available literature and prepared a matrix which cross-referenced 62 style elements and 18 authors. Elements and authors related to this study include:

Element	Author (s):
Visual	Riessman; Hill
Ora-Aural	Riessman; Hill
Physical/Tactile	Reissman; Hill
Perceptual/Conceptual	Davis
Auditory	Hill
Olfactory	Hill
Savory	Hill
Kinesthetic	Hill
Perceptual Strengths	Dunn and Dunn

(Oen, 1973, pp. 18-19).

Though the authors listed above provided some insight into this study, the thrust is focused on the perceptual modality elements conceptualized by French (1975): print, aural, interactive, visual, tactile, motor, and olfactory. French theorized that each learner has an individual orientation or preference in one or more of the sensory-intake

styles. He encouraged teachers to observe learner activities in the various modes, identify each learner's orientation, and develop instructional strategies to match the student's learning style. French (1975) also suggested that extensive research was needed to produce effective measurement instruments.

Gilley (1975) developed, tested, and validated the Multi-Modal Paired Associates Learning Test to measure six of the French's seven elements. The element eliminated by the Gilley test was the olfactory. In all the modality elements, Gilley found that each could be effectively measured using his MMPALT. Gilley (1975) also found that third grade students possess individual differences in perceptual learning style, and the two most dominant styles were haptic and visual.

The four learning styles that have received specific attention from several authors are; visual, haptic, kinesthetic, and aural. Riessman (1962) identified seven unique characteristics of deprived children. One of those characteristics suggested that deprived children are, "physical and visual rather than aural" (p. 73). In a test conducted by Lowenfeld (1945), he found the 1100 subjects to be 47 percent visual, 23 percent haptic, and 30 percent not identifiable. Barbe and Milone (1981) summarized their conclusions in the 1981 edition of Educational

Leadership:

The most frequent modality strengths are visual or mixed; each accounts for about 30 percent of the population (although mixed modality strengths are more frequent among adults than children). About 25 percent of the population are auditory, and the remaining 15 percent are kinesthetic (p. 378).

Other conclusions include that primary grade children are more auditory than visual. However, between kindergarten and six grade, a

modality shift occurs and visual becomes the more dominate modality and the kinesthetic element overtakes aural. Visual remains the dominant modality in adulthood, but aural becomes more important than kinesthetics.

It appears that style preferences do not change with individual learning. Keefe (1979) contradicts one of Barbe and Milon's conclusions: "Perceptual preference seems to evolve for most students from psychomotor (tactile/kinesthetic) to visual and aural as the learner matures" (p. 127).

The olfactory, print, and interactive styles have not been researched as well as the other style elements; however, they are included in the self-report measurement systems of some authors. Hill (1976) included considerations for both olfactory and savory styles. Also, Dunn and Dunn (1977) include both print and visual considerations in their style elements, using a self-report system. The self-report system approach used to identify learner preference has received little validation against measurements of actual strengths and weaknesses in student learning styles.

The seven elements of this study have received varying degrees of emphasis in previous research. Terms used have been applied to a variety of human skills and manifest themselves in varying degrees in individual learners. Although there are varying degrees, in emphasis, and in styles, it is apparent that the seven learning styles measured in this study do exist in individual learners and there is a need for further investigation of these styles with individual learners.

Measurement of Learning Style Elements

Most of the objective measurement and validated subjective measurements of individual differences in learning processes have come from the field of psychology, and tend to focus on mental processes. Some of those measurement approaches do, however, provide guidance for this study.

Numerous tests to measure the visual-haptic elements of the cognitive style were developed by Lowenfeld (as cited in Ragan, 1979). In his testing procedure he required subjects to combine partial visual impressions into whole visual images, to form visual images of items expressed kinesthetically. Lowenfeld based his testing on distinctions between visuals and haptics:

Whereas the visual has the ability to see a whole, break it up and its component details, and then resynthesize the details back to a whole; the haptic is unable to do this.

Whereas the visual tends to react to stimuli as a spectator and to "see" experiences, the haptic tends to react emotionally, to "feel" stimuli, and place self into the situation.

Whereas the visual has the tendency and ability to visualize and integrate tactile and partial experiences, the haptic has neither this tendency nor ability.

Whereas the visual has the ability to maintain visual imagery mentally, the haptic is unable to this (p. 21).

Ragan (1979) reported that the materials Lowenfeld used to measure style elements were kept simple enough to minimize mental imagery and emotional reactions. Cherry (1981) reported this was an important implication for designing his study.

Versions of the Embedded-Figure Test have been used to measure the tactile, auditory, and visual elements of "cognitive style." These tests were found to be influenced by the subject's intellectual ability (Ragan

et al., 1979). This need to minimize the impact of intellectual ability and cognitive activity on test results tends to support the revisions made in the MMPALT using the 10-item cluster arrangement and a simplified scoring procedure.

Results of Findings

The major thrust of this study is the assessment of the perceptual style of individual learners. However, it should be noted that this student and five fellow students at Oklahoma State University are investigating the learning styles of specific adult populations, using the seven perceptual modality elements conceptualized by French (1975).

Gilley's study investigated learning styles of 24 third grade students and used a rank-order for both high achiever and low achievers. According to Gilley's study, both high and low achievers demonstrated strengths in haptic style with visual style as the secondary strengths. Rank order findings for Gilley's study were:

<u>High Achiever</u>	<u>Low Achiever</u>
1. Haptic	1. Haptic
2. Visual	2. Visual
3. Aural	3. Kinesthetic
4. Print	4. Aural
5. Kinesthetic	5. Interactive
6. Interactive	6. Print

(Gilley, 1975, p. 80).

Figure 2. Gilley's Rank Order Findings

Cherry's study (1981) consisted of a population of 96 adults with age range from 19 to 68 and education range from eighth grade to advanced degrees. The primary strengths were shown in the visual style with the secondary strengths in the haptic style. Rank order findings for Cherry's study were visual, haptic, aural, interactive, print, kinesthetic, and olfactory, respectively.

The rank order results of measured styles are significant; however, researchers tend to emphasize student primary styles because they have direct implications for methods of teaching. Lowenfeld (1945) reported the adults are primarily visual learners. Barbe and Milone (1981) found elementary school children to be strongest in the auditory style while sixth graders and adults were strongest in the visual style. In the Riessman (1962) studies, deprived children were strongest in the physical (Haptic/Kinesthetic) styles.

Research on self-reporting instruments (Keefe, 1979) has inferred that the primary strengths for younger students are tactile and kinesthetic, and adults are primary visual and aural learners. Also, Griggs and Price (as cited in Keefe, 1979) found that non-gifted children preferred auditory learning. The research data collected by Griggs and Price used the Stanford Achievement Tests and the Dunn, Dunn, and Price Learning Styles Inventory.

Based on the extensive use of their instrument, Dunn, Dunn, and Price (as cited in Keefe, 1979) concluded that the majority of the students tested are not auditory learners, but it appears many students are tactual and/or kinesthetic learners. The tendency to learn through the latter two senses appears to decrease with maturity (p. 53).

Summary

Literature is limited on the specific concepts of perceptual differences in individual learning styles, however, the field of psychology has focused on the connection of stimuli and response. The need of individualized instruction is based upon the assumption that individuals have a variety of learning differences. Sensory intake or perception is among the central theme of differences. The perceptual modality is the individual's primary means of absorbing information from the environment. Past measurements of individual differences have focused on the internal cognitive processes or self-reporting type instruments. Cognitive research has provided limited guidance for the current study of external information gathering. However, further research in this area is needed to lend support for these assumptions.

CHAPTER III

METHOD AND PROCEDURE

The purpose of this study was to measure the individual learning styles, using the MMPALT II, of the Oklahoma Association of Youth Services (OAYS). This chapter includes the following sections:

- 1) Population and Selection,
- 2) Instrumentation,
- 3) Design and Test Procedure,
- 4) Data Collection,
- 5) Data Analysis.

Population and Selection

The population sampled was restricted to the membership of 38 agencies with over 400 staff members within the Oklahoma Association of Youth Services (OAYS). This is a group of professionals that provide counseling and shelter services to troubled youths in Oklahoma.

The primary goals of the Youth Services agencies include:

Provide emergency shelter care (in lieu of jail) for those youths who need to be detained or those youths for whom no suitable alternative placement can be arranged.

Receive referrals from courts, police, schools, churches, agencies, and individuals for youths experiencing difficulties.

Identify gaps in existing community services and work with other community agencies toward filling these gaps and coordinating services to reduce duplication.

Work closely with law enforcement agencies to develop a systematic method of referral.

Work closely with schools to develop methods and alternatives for addressing problems of truancy, behavior, and other conflicts (Department of Human Services, 1974, p. 3)

Instrumentation

Gilley (1975) and French (1975) originally developed the first version of the Multi-Modal Paired Associates Learning Test (MMPALT). The instrument initially was used with a group of third graders to measure the subjects' ability to discriminate and recall information of the six elements of the perceptual modality styles.

The MMPALT II was refined and revised by Cherry (1981). Testing procedures were developed to shorten test administration time and to measure weakness and strengths of the individual learners. Style elements included print, aural, visual, haptic, kinesthetic, interactive, and olfactory. Results were then rank ordered from the strongest style to the weakest style. See a copy of Appendix A for MMPALT II.

The PMPS procedures also were developed by Cherry (1981). It is a self-reporting questionnaire which measures the individual's intuitive assessment of the seven perceptual learning styles. The survey consists of 42 questions with one neutral, two positive and two negative options. Four of these responses have an element of time references: (1) always, (2) usually, (3) seldom, (4) never. The fifth response is the neutral response -- do not mark. See Appendix B for a copy of the PMPS. Permission was given by Dr. Russell French in a letter for this research to use both the MMPALT II and the PMPS. See Appendix C for a copy of the letter.

Design and Test Procedures for MMPALT II

The procedures for testing the 40 subjects were basically the same. The print, aural, and visual were conducted in small groups. The other four elements were conducted on an individual basis.

Each group was greeted and given an introduction to learning styles by the researcher. Appendix D provides a copy of the introduction. During this time, the participants filled out the demographic form. A copy of this form can be found in Appendix E. The researcher assured the participants that this was not a pass/fail test, but merely an instrument to rank the best learning style for each participant.

Each test used identical procedures to measure the learning style. The participants were presented with 10 timed stimulus response pairs. This was followed by a randomly selected stimulus with time allowed to identify the common response on answer sheet (see Appendix F). Specific procedures for each element are discussed as follows:

Print

This learning style presented 10 pairs of printed trigrams (nonsense words) and common nouns on a screen and then asked participants to recall the correct common noun when a trigram was shown. This style was presented in a group setting. Each participant was provided a response sheet and pencil. After the 10 pairs were presented, the facilitator projected the trigram at random and announced the number to coincide with the response sheet. Participants were allowed 10 seconds to respond.

Aural

This learning style incorporated the use of a tape recorder. The

participants listened to a spoken trigram followed by a common noun. Ten pairs were presented, then only the trigram was presented and the participants were given 10 seconds to write a response. This style was also presented in a group setting.

Visual

This learning style consisted of 10 pairs of abstract symbols on slides. Each abstract symbol was matched with a common object form or picture. Participants were shown the 10 pairs of slides. Then, only the abstract symbols were presented and the participant had 10 seconds to write a response on the answer sheet. This element was presented in a group setting.

Haptic

This learning style required that the participants be blindfolded during the presentation of print abstract and common objects. Each object was placed in the participants hand. The participant was allowed to hold the paired objects for seven seconds. Then the abstract object was presented and the participant had 10 seconds to respond with the appropriate common object. The facilitator recorded the response on the answer sheet.

Interactive

This learning style required the participants to explain how pairs of nonsense words and common words might be remembered. Again, the participant was blindfolded during the process. The facilitator would state "The nonsense word in this pair is -- , and the common word is --."

Please repeat both words. How will you remember this pair of words?"

The facilitator recorded the results.

Kinesthetic

This learning style required the participants to perform pairs of body movements. As with the other styles, the participant was blindfolded. The facilitator directed the participant through the pairs of body movement. Each participant would then have 10 seconds to respond to the nonsense movement with the appropriate movement. The facilitator, again, recorded the response on the answer sheet.

Olfactory

This learning style consisted of 10 pairs of aromas presented to the participants. If the participant could not identify the aromas, then the facilitator would identify the smell. After the 10 pairs were presented, only the abstract smell would be represented and the participant would respond with the appropriate answer. The participant was blindfolded during this procedure and the facilitator recorded responses.

Test Procedures for the PMPS

The survey was given without modification. One half of the participants received the survey in the beginning of the process. And one half received the survey after the MMPALT II was given. Each participant had an understanding of the PMPS through discussion with the facilitator and through the introduction sheet to the PMPS. A copy of the introduction is presented in Appendix G. A copy of the scoring sheet is included in Appendix H.

Collection of Data

At the September, 1983 Quarterly Membership Meeting, OAYS members were informed about the study. Agencies were encouraged to volunteer their staff to participate in the study. Sign-up sheets were distributed for signatures of persons interested in being subjects of the research (See Appendix I for a copy of the sign-up sheet). Forty administrators, community counselors, shelter counselors, and support personnel signed up. By utilizing the sign-up sheets, testing sites were scheduled at Enid, Norman, Shawnee, and El Reno from October, 1983 to January, 1984. All sites except El Reno were scheduled for one day. El Reno had several scheduled days due to coordination between staff commitments and the Southwest Cluster (Duncan, Lawton, and Clinton) meetings held at the El Reno office.

At each site, all subjects were introduced to the MMPALT II and the PMPS survey in a group setting. Each subject filled out the demographic data form and at some sites each would complete the PMPS survey before the MMPALT II was administered. The first three elements (print, aural, and visual) were presented in a group. The four remaining elements were presented in individual presentations due to the nature of the testing procedure. In some sites, the PMPS survey was completed after the MMPALT II.

The recording of data consisted of hand scoring and ranking the results of two instruments. All forms were inspected to make sure everything had been filled out and completed. The information for all data was then recorded in a log for easy access. The participants received written reports of the results of the MMPALT II and the PMPS survey. The reports provided both the raw scores and ranks.

Introductions of the MMPALT II and the PMPS were presented in the same manner. Tests were administered in the same manner for consistency.

Data Analysis

The data was processed with the assistance of professional statistical researchers at Oklahoma State University. Programs were designed to calculate analysis of variance of subgroups that had more than two groupings. Hartley's F-max was used to test for equality of variance. For subgroups that had only two groupings, the t test was calculated. Finally, correlation categories were computed for each subject in relation to each style for self-assessment and actual measurement of the learning style. Determination of correlation strength utilized the following categories:

<u>Relationship</u>		<u>Coefficient</u>
Very high	=	.80 or above
Strong	=	.60 to .80
Moderate	=	.40 to .60
Low	=	.20 to .40
Very Low	=	.20 or less

(Bartz, 1981, p. 202).

Figure 3. Bartz's Correlation Strength Categories

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to provide information on the primary learning styles of the Oklahoma Association of Youth Services members. This chapter presents the results of the data in the following sections:

- 1) Demographic Data,
- 2) Results of MMPALT II,
- 3) Results of PMPS,
- 4) Correlation of MMPALT II and PMPS,
- 5) Differences between subgroupings,
- 6) Observations of Researcher.

Demographic Data

The subjects for this study consisted of 40 Oklahoma Association of Youth Services (OAYS) members. See Appendix J for a copy of the summary of demographic data. The demographic data are presented in Table I. The population was divided into four job titles; consisting of nine administrators; nine community youth services counselors; 11 emergency shelter counselors; and 11 support personnel. The subjects' ages ranged from 20-59 years. There were 24 females and 16 males, with both sexes represented in job titles.

The sample also included 25 married individuals and 15 single individuals. The education backgrounds ranged from some high school to

TABLE I
DEMOGRAPHIC DATA

	Frequency	Percent
Job Title		
Administrator	9	23
Community Youth Services Counselors	9	23
Emergency Shelter Counselors	11	28
Support Personnel	11	28
Age		
20 - 29	15	37.5
30 - 39	18	45.0
40 - 49	3	7.5
50 - 59	4	10.0
Sex		
Female	24	60
Male	16	40
Status		
Single	15	37.5
Married	25	62.5
Education		
Some High School	1	2.5
Some College	7	17.5
Bachelor's Degree	16	40.0
Master's Degree	14	35.0
Doctor's Degree	2	5.0
Smoking		
No	22	55.0
Yes	18	45.0

doctoral degrees. The average education background was a bachelor degree. Most individuals tested were non-smokers.

Results of MMPALT II

The results from measuring learning style elements both by score and rank are presented in Tables II and III, respectively. (See Appendix K for a copy of individual rank and scores). Visual comparisons between the scores and ranks show the preferred learning style element to be visual.

Twenty-two of the 40 subjects scored eight or higher in the visual learning element test in Table II. Ten of the 40 subjects scored eight or higher in the print and interactive elements tests. The score mean for visual was 7.15. Print and interactive score means were 5.35 and 5.25 respectively. The aural element score mean was 5.70; however, there were only nine subjects that scored eight or higher.

In comparing ranks of the learning elements in Table III, visual had 16 subjects ranked as the primary learning element, with 30 subjects showing a rank order of two or above. Print and interactive elements each had 11 subjects ranked at two or above. Eight subjects ranked two or above on the aural element.

Results of PMPS

A summary of the PMPS scored is presented in Table IV. The highest PMPS score mean of the seven learning style elements was perceived as the interactive element. Aural, kinesthetic, and print were perceived to be stronger than the others. The mean scores were 6.10, 5.68, and 5.38 respectively. Visual, haptic, and olfactory were perceived as weaker. The mean scores were 1.30, -4.28, and -24.20 respectively.

TABLE II
SUMMATION OF MMPALT II ELEMENT SCORES

Element		Scores Made on Elements											Range	Mean
		0	1	2	3	4	5	6	7	8	9	10		
Print	N*	1	6	1	4	4	4	6	4	1	4	5	0-10	5.35
Aural	N	0	2	3	4	4	6	2	10	2	6	1	1-10	5.70
Inter- active	N	0	4	4	5	0	7	6	4	3	4	3	1-10	5.25
Visual	N	2	2	1	3	2	2	5	1	3	6	13	0-10	7.15
Haptic	N	0	4	5	2	7	9	3	3	5	2	0	1- 9	4.75
Kines- thetic	N	0	4	2	8	11	4	7	2	1	1	0	1- 9	4.02
Olfactory	N	9	18	7	5	1	0	0	0	0	0	0	0- 4	1.33

* N = Number of subjects

TABLE III

SUMMATION OF LEARNING STYLE STRENGTHS DEMONSTRATED BY MMPALT II RANKINGS

Rank Order	Elements						
	Print N	Aural N	Interactive N	Visual N	Haptic N	Kinesthetic N	Olfactory N
1	1	2	1	16	5	1	0
1.5	5	2	2	7	1	1	0
2	5	4	8	7	2	5	0
2.5	1	3	5	1	2	2	0
3	1	13	6	1	5	2	0
3.5	0	3	3	1	1	0	0
4	0	2	3	2	5	3	0
4.5	6	3	2	1	3	3	2
5	3	4	2	1	5	8	2
5.5	1	1	1	0	4	4	1
6	4	2	4	2	3	9	6
6.5	2	1	2	0	3	3	5
7	2	0	1	1	1	0	24
Total Subjects	40	40	40	40	40	40	40

TABLE IV
SUMMARY OF PMPS SCORES

Learning Style	Subject Distribution by Score Categories (Intervals)								Range	Mean
	(-45 -28) N	(-27 -17) N	(-26 -6) N	(-5 +5) N	(+6 +16) N	(+17 +27) N	(+28 +46) N			
Print	0	3	6	10	11	9	1	-22 +29	5.38	
Aural	0	1	5	14	15	4	1	-19 +28	6.10	
Inter- active	0	0	1	8	18	13	0	- 6 +27	10.85	
Visual	0	0	10	15	15	0	0	-15 +15	1.30	
Haptic	0	3	18	11	7	1	0	-20 +19	-4.28	
Kines- thetic	0	0	10	10	11	5	4	-16 +33	5.68	
Olfactory	18	14	5	1	2	0	0	-46 +46	-24.20	

The summary of the rank-order for the PMPS is shown in Table V. Interactive and kinesthetics were ranked as the strongest perceived learning elements. No two subjects recorded the same scores across all seven elements. The olfactory was the weakest element for most subjects.

Correlation of MMPALT II and PMPS

Correlations between the MMPALT II scores and the PMPS scores are presented in Figure 4 utilizing the correlation strengths by Bartz, (1981). There were no meaningful correlations between the two instruments. All element scores were very low except in the element styles of aural and kinesthetic which represented low correlations.

Correlations between the MMPALT II ranks and the PMPS ranks are shown in Figure 5. There were no meaningful correlations between the two instruments. Aural ranks shows low correlation with all other elements having very low correlations.

Differences of Subgroups

T tests and ANOVA tests were used to determine significant differences between the subgroups of sex, age, marital status, education, and smoking measured by the MMPALT II and the PMPS.

Sex

The results of the t tests by sex on the MMPALT II element scores are shown in Table VI. There were no significant differences at the .05 level for any of the tests. The PMPS element scores are presented in Table VII. There were no significant differences at the .05 level for

TABLE V
SUMMATION OF LEARNING STYLE STRENGTHS DEMONSTRATED BY PMPS RANKINGS

Rank Order	Elements						
	Print N	Aural N	Interactive N	Visual N	Haptic N	Kinesthetic N	Olfactory N
1	9	4	11	1	1	11	1
1.5	1	1	4	0	0	1	0
2	6	9	7	3	5	3	1
2.5	0	0	1	1	0	2	0
3	6	8	7	11	2	2	0
3.5	1	0	1	1	1	1	0
4	4	7	5	6	5	6	0
4.5	1	0	2	3	1	0	0
5	6	6	2	5	5	9	1
5.5	0	0	0	1	1	1	1
6	3	3	0	7	18	3	3
6.5	0	1	0	1	0	0	0
7	3	1	0	0	1	1	33
Total Subjects	40	40	40	40	40	40	40

		ELEMENTS						
		PRINT	AURAL	INTERACTIVE	VISUAL	HAPTIC	KINESTHETIC	OLFACTORY
P M P S S C O R E S	Print	0.017 (very low)						
	Aural		-0.289 (low)					
	Interactive			0.020 (very low)				
	Visual				0.045 (very low)			
	Haptic					-0.158 (very low)		
	Kinesthetic						-0.281 (low)	
	Olfactory							0.096 (very low)

Figure 4. Correlation of MMPALT II Element Scores with the Correspondent PMPS Elements
(Bartz, 1981, p. 202)

		ELEMENTS						
		PRINT	AURAL	INTERACTIVE	VISUAL	HAPTIC	KINESTHETIC	OLFACTORY
P M P S R A N K S	Print	-0.073 (very low)						
	Aural		-0.316 (low)					
	Interactive			-0.081 (very low)				
	Visual				0.030 (very low)			
	Haptic					-0.072 (very low)		
	Kinesthetic						-0.139 (very low)	
	Olfactory							-0.078 (very low)

Figure 5. Correlation of MMPALT II Element Ranks with the Correspondent PMPS Elements (Bartz, 1981, p. 202)

TABLE VI
RESULTS OF t TESTS ON MMPALT II ELEMENT SCORES BY SEX

Element	Sex	N	\bar{X}	SD	t
Print	Female	24	5.79	3.15	1.122
	Male	16	4.69	2.89	
Aural	Female	24	6.13	2.46	1.339
	Male	16	5.06	2.46	
Interactive	Female	24	5.25	2.98	0.000
	Male	16	5.25	2.89	
Visual	Female	24	8.17	2.87	2.735
	Male	16	5.63	2.90	
Haptic	Female	24	5.58	2.22	3.036
	Male	16	3.50	1.97	
Kinesthetic	Female	24	4.33	1.83	.999
	Male	16	3.75	1.77	
Olfactory	Female	24	1.38	1.01	.761
	Male	16	1.13	1.02	

TABLE VII
RESULTS OF t TESTS ON PMPs ELEMENT SCORES BY SEX

Element	Sex	N	\bar{X}	SD	t
Print	Female	24	5.29	14.25	-0.050
	Male	16	5.50	10.97	
Aural	Female	24	3.88	11.66	-1.621
	Male	16	9.44	8.83	
Interactive	Female	24	11.17	8.55	.282
	Male	16	10.38	8.92	
Visual	Female	24	1.33	8.72	.030
	Male	16	1.25	8.33	
Haptic	Female	24	-2.17	10.44	-0.056* ^a
	Male	16	-1.75	28.60	
Kinesthetic	Female	24	4.21	14.30	-0.818
	Male	16	7.88	13.25	
Olfactory	Female	24	-26.54	12.18	-1.439
	Male	16	-20.69	13.44	

* Significant difference beyond .05 level

^a Utilized a corrected t value for unequal variance

any of any tests except in the haptic element.

Age

The results of the ANOVA tests on MMPALT II element scores by age are presented in Table VIII. There were no significant differences at the .05 levels for any of the tests. The results of ANOVA tests on PMPS scores by age as shown in Table IX show no significant differences at the .05 level for any test.

Marital Status

The results of the t tests by marital status on the MMPALT II element scores are presented in Table X. All tests on the elements except for the olfactory element showed no significant differences at the .05 level. However, the olfactory results showed a significant difference at the .05 level. The results of the t tests on PMPS element scores by marital status are presented in Table XI. There were no significant differences at the .05 level for any tests except the haptic element.

Education

The results of ANOVA tests on the MMPALT II element scores by education are shown in Table XII. There were no significant differences for any tests at the .05 level. The results of ANOVA tests on PMPS element scores for education are presented in Table XIII. Again, there were no significant differences on any tests at the .05 level.

Smoking

The results of t tests on MMPALT II element scores by smoking are

TABLE VIII
RESULTS OF ANOVA TESTS ON MMPALT II ELEMENT SCORES
BY AGE

Style	Source	df	SS	MS	F
Print	Between groups	3	75.95	25.32	3.15
	Within groups	36	<u>289.15</u>	8.03	
	Total	39	<u>365.10</u>		
Aural	Between groups	3	22.75	7.58	1.25
	Within groups	36	<u>217.65</u>	6.05	
	Total	39	<u>240.40</u>		
Interactive	Between Groups	3	21.24	7.08	.83
	Within groups	36	<u>308.26</u>	8.56	
	Total	39	<u>329.50</u>		
Visual	Between groups	3	68.34	22.78	2.66
	Within groups	36	<u>308.76</u>	8.58	
	Total	39	<u>377.10</u>		
Haptic	Between groups	3	11.14	3.71	.66
	Within groups	36	<u>202.36</u>	5.62	
	Total	39	<u>213.50</u>		
Kinesthetic	Between groups	3	5.47	1.82	.54
	Within groups	36	<u>122.13</u>	3.39	
	Total	39	<u>127.60</u>		
Olfactory	Between groups	3	3.18	1.06	1.04
	Within groups	36	<u>36.79</u>	1.02	
	Total	39	<u>39.97</u>		

TABLE IX
RESULTS OF ANOVA TESTS ON PMPs ELEMENT SCORES
BY AGE

Style	Source	df	SS	MS	F
Print	Between groups	3	58.53	19.51	.11
	Within groups	35	6420.84	178.25	
	Total	39	6479.37		
Aural	Between groups	3	514.97	171.66	1.52
	Within groups	36	4076.63	113.29	
	Total	39	4591.60		
Interactive	Between Groups	3	121.70	40.57	.53
	Within groups	36	2759.40	76.66	
	Total	39	2881.10		
Visual	Between groups	3	344.75	114.92	1.69
	Within groups	36	2445.65	67.93	
	Total	39	2790.40		
Haptic	Between groups	3	1023.21	341.07	.89
	Within groups	36	13752.79	382.02	
	Total	39	14776.00		
Kinesthetic	Between groups	3	195.63	65.21	.32
	Within groups	36	7271.15	201.98	
	Total	39	7466.78		
Olfactory	Between groups	3	236.88	78.96	.46
	Within groups	36	6133.52	170.38	
	Total	39	6370.40		

TABLE X
RESULTS OF t TESTS ON MMPALT II ELEMENT SCORES BY MARITAL STATUS

Style	Status	N	\bar{X}	SD	t
Print	Married	25	5.60	2.92	.662
	Single	15	4.93	3.35	
Aural	Married	25	6.04	2.23	.122
	Single	15	5.13	2.85	
Interactive	Married	25	4.96	2.84	-.811
	Single	15	5.73	3.06	
Visual	Married	25	7.52	2.80	.970
	Single	15	6.53	3.58	
Haptic	Married	25	5.12	2.33	1.302
	Single	15	4.13	2.29	
Kinesthetic	Married	25	4.20	2.02	.447
	Single	15	3.93	1.44	
Olfactory	Married	25	1.60	.224	3.427* ^a
	Single	15	0.73	.118	

* Significant difference beyond .05 level

^a Utilized a corrected t value for unequal variance

TABLE XI
RESULTS OF t TESTS ON PMPs ELEMENT SCORES BY MARITAL STATUS

Style	Status	N	\bar{X}	SD	t
Print	Married	25	4.16	12.30	-0.765
	Single	15	7.40	14.00	
Aural	Married	25	6.80	9.11	.522
	Single	15	4.93	13.55	
Interactive	Married	25	10.32	8.16	-0.499
	Single	15	11.73	9.50	
Visual	Married	25	2.88	8.21	.553
	Single	15	-1.33	8.48	
Haptic	Married	25	-0.88	23.64	.560 ^{*a}
	Single	15	-3.87	9.58	
Kinesthetic	Married	25	7.16	14.54	.874
	Single	15	3.20	12.67	
Olfactory	Married	25	-25.60	12.84	-0.892
	Single	15	-21.86	12.77	

* Significant difference beyond .05 level

^a Utilized a corrected t value for unequal variance

TABLE XII
RESULTS OF ANOVA TESTS ON MMPALT II ELEMENT SCORES
BY EDUCATION

Style	Source	df	SS	MS	F
Print	Between groups	3	61.36	20.45	2.42
	Within groups	36	303.74	8.43	
	Total	39	<u>365.10</u>		
Aural	Between groups	3	33.43	11.14	1.94
	Within groups	36	206.97	5.75	
	Total	39	<u>240.40</u>		
Interactive	Between Groups	3	84.82	28.27	4.16
	Within groups	36	244.68	6.80	
	Total	39	<u>329.50</u>		
Visual	Between groups	3	38.29	12.76	1.36
	Within groups	36	338.81	9.41	
	Total	39	<u>377.10</u>		
Haptic	Between groups	3	24.37	8.12	1.55
	Within groups	36	189.13	5.25	
	Total	39	<u>213.50</u>		
Kinesthetic	Between groups	3	12.35	4.12	1.29
	Within groups	36	115.25	3.20	
	Total	39	<u>127.60</u>		
Olfactory	Between groups	3	5.38	1.79	1.87
	Within groups	36	34.59	.96	
	Total	39	<u>39.97</u>		

TABLE XIII
RESULTS OF ANOVA TESTS ON PMPS ELEMENT SCORES
BY EDUCATION

Style	Source	df	SS	MS	F
Print	Between groups	3	619.61	206.54	1.27
	Within groups	36	5859.76	162.77	
	Total	39	<u>6479.37</u>		
Aural	Between groups	3	173.81	57.94	.47
	Within groups	36	4417.79	122.72	
	Total	39	<u>4591.60</u>		
Interactive	Between Groups	3	144.65	48.22	.63
	Within groups	36	2736.45	76.01	
	Total	39	<u>2881.10</u>		
Visual	Between groups	3	55.14	18.38	.24
	Within groups	36	2725.26	75.98	
	Total	39	<u>2790.40</u>		
Haptic	Between groups	3	515.40	171.80	.43
	Within groups	36	14260.60	396.13	
	Total	39	<u>14776.00</u>		
Kinesthetic	Between groups	3	249.28	83.09	.41
	Within groups	36	7217.50	200.49	
	Total	39	<u>7466.78</u>		
Olfactory	Between groups	3	243.74	77.58	.46
	Within groups	36	6137.66	170.49	
	Total	39	<u>6370.40</u>		

presented in Table XIV. Twenty-two subjects out of 40 were non-smokers. There were no significant differences at the .05 level for any of the tests. The results of the t tests on the PMPS element scores by smoking are presented in Table XV. The olfactory element and the haptic element showed significant differences at the .05 level. However, the other tests showed no significant difference at the .05 level.

Observations of Researcher

Other information observed, but not formally researched, revealed that 15 subjects had no children. This figure represents 37.5 percent of the subjects tested. Twelve subjects had only one income. Twenty-four out of 40 subjects had less than three years' experience. Eighteen subjects were born in rural areas.

Only two subjects were left-handed. Neither seemed to have problems with the presentation of stimuli-response in the haptic element. One subject had less than three hours sleep due to serious problems in the shelter. She reported some difficulty in concentrating. Two subjects appeared to be preoccupied when the tests were administered.

TABLE XIV
RESULTS OF t TESTS ON MMPALT II ELEMENT SCORES BY SMOKING

Element	Smoking	N	\bar{X}	SD	t
Print	No	22	5.32	2.70	-0.072
	Yes	18	5.39	3.53	
Aural	No	22	5.59	2.46	-0.304
	Yes	18	5.83	2.57	
Interactive	No	22	4.59	3.05	-1.618
	Yes	18	6.06	2.58	
Visual	No	22	7.00	3.09	-0.333
	Yes	18	7.30	3.22	
Haptic	No	22	4.64	2.40	-0.336
	Yes	18	4.89	2.32	
Kinesthetic	No	22	3.86	1.64	-0.912
	Yes	18	4.39	2.00	
Olfactory	No	22	1.45	1.07	1.249
	Yes	18	1.06	0.94	

TABLE XV
RESULTS OF t TESTS ON PMPs ELEMENT SCORES BY SMOKING

Element	Smoking	N	\bar{X}	SD	t
Print	No	22	2.36	13.22	-1.670
	Yes	18	9.06	11.79	
Aural	No	22	3.60	10.53	-1.652
	Yes	18	9.17	10.72	
Interactive	No	22	10.77	9.18	-0.062
	Yes	18	10.94	8.08	
Visual	No	22	2.45	8.43	.953
	Yes	18	-.11	8.51	
Haptic	No	22	-4.10	11.22	.790 ^{*a}
	Yes	18	-4.50	9.26	
Kinesthetic	No	22	9.30	13.14	.878
	Yes	18	1.30	13.73	
Olfactory	No	22	-21.45	15.60	1.632 ^{*a}
	Yes	18	-27.60	7.25	

* Significant difference beyond .05 level

^a Utilized a corrected t value for unequal variance

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter is divided into three discussion sections. The first section presents the summary of the study. The second section presents the conclusions of the study questions, and the third section presents the recommendations.

Summary

The purpose of the study was to measure the learning styles of the Oklahoma Association of Youth Services members. The population sample consisted of 40 members; 25 female and 15 males. The ages ranged from 22 to 59 years. Nine of the subjects were administrators, nine community counselors, 11 shelter counselors, and 11 support personnel.

Each subject was tested using the MMPALT II and the PMPS survey. The data were compiled on score sheets and transferred to the key punch and computed by the Oklahoma State University Computer Center.

Total ranks and scores were computed for the MMPALT II and the PMPS. T tests and ANOVA tests were used to compute significant differences. Additionally, the study computed the correlating coefficients for each subject in relationship to each style for self-assessment and actual measurement of the learning style.

Conclusions

The conclusions of this study are stated as they relate to each of the research questions in Chapter I.

1) The preferred learning style of OAYS members was the visual element. The print and interactive elements were the next two highest scores. The aural element, although having a higher mean than print and interactive, actually had fewer subjects with higher scores (8-10). Olfactory was consistently the lowest element.

2) The results of the MMPALT II scores and the PMPS scores show that there were no meaningful correlation between the two instruments. The ranks of the two instruments also show no meaningful correlation between the two instruments.

3) There were no significant differences between element scores by sex on the MMPALT II. The haptic element showed a significant difference on the PMPS by sex. All other elements showed no significant difference on the PMPS.

4) The results of the ANOVA tests on the MMPALT II element scores and the PMPS element scores show no significant differences in the subgroupings of age and education. There were significant differences in both instruments by marital status. On the MMPALT II, the olfactory element did show a significant difference. All other elements in this subgroup showed no significant differences. A significant difference in the haptic element was seen in the PMPS scores by sex.

The PMPS survey is an instrument used for self-assessment of how an individual perceives their individual learning style. In contrast, the MMPALT II is an actual assessment of an individual's learning style. However, the olfactory element and the haptic element showed significant

differences within the subgroup of smoking. All other elements in these subgroups show no significant differences.

Recommendations

Recommendations for practice resulting from this study include: Members of the Oklahoma Association of Youth Services (OAYS) use the assessment of their personal strengths as shown by the MMPALT II in planning or developing the specialty group process activities. Awareness of the other styles could help each counselor incorporate more variety in those activities to provide for clients' individual learning styles.

Members should ignore the results of the PMPs survey due to very low correlation between perception of learning styles and actual learning styles. OAYS should consider developing training through the Oklahoma University Juvenile Personnel Training Program (OUJPTP) to provide the total membership an opportunity to develop at least awareness of individual learning styles.

Recommendations for further research include:

1. Additional research should be conducted to expand in various populations, to increase the data base, to validate the MMPALT II instrument, and to standardize the process and procedures of the tests.

2. Future research to explore the impact of left-handedness versus right-handedness and their effect on the preferred learning styles should be conducted. Handedness may make a difference in the presentation of certain elements subtests. Thought processes may be different and a variety of other variables may affect results.

3. Further research in the olfactory element should be considered to determine why there were significant differences between married status and single status on the MMPALT II.

4. Further research should be conducted to develop a better self-assessment instrument or delete the existing instrument in future research studies.

BIBLIOGRAPHY

- Barbe, Walter B. and Michael N. Milone, Jr. "What We Know About Modality Strengths." Educational Leadership, Vol. 38, Number 5, February, 1981.
- Bartz, Albert E. Basic Statistical Concepts. Minneapolis, Mn: Burgess Publishing Company, 1981.
- Bjorkquist, David. What Vocational Education Teacher Should Know About Individualized Instruction. Ohio State University, Columbus. Center for Vocational and Technical Education, ERIC Document 057184, November, 1971.
- Cherry, Clarence E. Jr. The Measurement of Adult Learning Styles: Perceptual Modality. (unpub. Ed.D. Disseration, University of Tennessee, 1981.)
- Darkenwald and Sharon B. Merriam. Adult Education: Foundation of Practice. Harper & Row Publishers, New York, 1982.
- Department of Human Services, Youth Service in Oklahoma Brochure, Oklahoma City, OK. 1974.
- Dewey, John. Experiement and Education. Macmillian, New York. 1938.
- Dunn, Rita, Kenneth Dunn, and Gary E. Price. "Diagnosing Learning Styles: A Prescription for Avoiding Malpractice Suites." Phi Delta Kappan, 1977, p. 58.
- Dunn, Rita and Kenneth Dunn. Teaching Students Through Their Learning Styles: A Practical Approach. Reston Publishing Co., Inc., Reston, Va., 1978.
- Evans, R., B. F. Skinner. The Man & His Ideas (New York: Dulton, 1968).
- Forgus, Ronald H. Perception. McGraw-Hill Book Company, New York, 1966.
- French, Russell L. Teaching Strategies and Learning, unpublished paper, Department of Curriculum and Instruction, The University of Tennessee, 1975.
- French, Russell L. Teaching Style and Instructional Strategy. Unpublished paper, Department of Curriculum and Instruction, The University of Tennessee, 1975.

- French, Russell L. "Learning Styles Revisited." Unpublished paper, The University of Tennessee, Knoxville, 1981.
- Gagne, Robert M. The Conditions of Learning, Holt, Rinehart and Winston, Inc., New York, 1965.
- Gagne, Robert M. (editor). Learning and Individual Differences, Charles E. Merrill Books, Inc., Columbus, Ohio, 1967.
- Gagne, Robert M. "Media and the Learning Process." Paper presented to the first general session, DAVI conference, Houston, Texas, March 25, 1968.
- Gagne, Robert M. "Some New Views of Learning and Instruction." Phi Delta Kappan, Vol. 51, Number 9, May 1970, pp. 468-472.
- Gilley, Daryl V. Personal Learning Styles: Exploring the Individual's Sensory Input Processes. Ed.D. Dissertation, University of Tennessee, Knoxville, August 1975.
- Glaser, Robert. "Some Implications of Previous Works on Learning and Individual Differences." Learning and Individual Difference, Charles E. Merrill Books, Inc., Columbus, Ohio, 1967.
- Goldstein, Kenneth M. and Sheldon Blackman. Cognitive Style: Five Approaches and Relevant Research, John Wiley and Sons, New York, 1978.
- Griffin, Thomas E. "Cognitive Style: A Science to Influence the Policy of Individualizing Instruction." A Practicum at NOVA University, January, 1974.
- Griffin, Thomas E. "Differences Between Developmental Studies Communication Students and Regular College Communication Students in Their Orientation to Symbols and Their Meaning." A Practicum at NOVA University, January, 1975.
- Hill, W. F. "Contemporary Developments Within Stimulus-Response Learning Theory," In Theories of Learning & Instruction, ed. Erest Hilsard (Chicago: University of Chicago Press, 1964).
- Hill, Joseph E. "The Educational Sciences." Oakland Community College, Bloomfield Hills, Michigan, 1976.
- Ingram, Jerry. "A Study of the Correlation Between Selected Instructional Methods and Individual Learning Styles. Final Report." Wisconsin University, ED113582, June, 1974.
- Jensen, Arthur R. "Varieties of Individual Differences in Learning." In Learning and Individual Differences, ed. Robert M. Gagne (Charles E. Merrill Books, Inc., Columbus, Ohio, 1967).
- Keefe, James W. (editor). Student Learning Styles. National Association of Secondary School Principals, Reston, Va., 1979.

- Knowles, Malcolm. The Adult Learner: A Neglected Species. Gulf Publishing Company, Houston, Texas, 1978.
- Knowles, Malcolm. The Modern Practice of Adult Education. Chicago, IL: Hollett Publishing Company, 1980.
- Lindeman, Edward C. The Meaning of Adult Education. New York: New Republic, Inc., 1926.
- Lowenfeld, V. The Nature of Creative Activity: Experimental and Comparative Studies of Visual and Non-Visual Sources. Harcourt, London, 1939.
- Lowenfeld, V. "Tests for Visual and Haptic Aptitudes." American Journal of Psychology, 58, 1945, pp. 100-112.
- Martens, Kay. "Cognitive Style: An Introduction with Annotated Bibliography," ERIC Reproduction Service, Bethesda, MD., ED104498, 1975.
- McKenney, James. Human Information Processing Systems. Working Paper, Harvard Graduate School of Business Administration, Boston, 1972.
- McKenney, James L. and Peter G. W. Keen. "How Managers' Minds Work." Harvard Business Review, 53, 3, 1974, pp. 79-90.
- Neugarten, Bernice, L. and Nancy Daton, "Sociological Perspectives on the Life Cycle," In Life Span Developmental Psychology: Personality & Socialization. Academic Press, New York, 1973.
- Oen, Urban T. "Investigating the Interaction of Learning Styles and Types of Learning Experiences in Vocational-Technical Education." Fox Valley Technical Institute, Appleton, Wisconsin, August 1973.
- Penland, Patrick R. "Self-Planned Learning in America." Paper presented Adult Education Research Conference, April, 1978.
- Ragan, Tillman J., (et al.). Cognitive Styles: A Review of Literature. Air Force Systems Command, Brooks Air Force Base, Texas, May, 1979.
- Riessman, Frank. The Culturally Deprived Child. Harper, New York, 1962.
- Sailor, Anita Louise. "A Factor Analysis of the Cognitive Style Map and Other Selected Variables." DAI, 38 (1978), 2485-6B (East Texas State University).
- Scarborough, Anne Louise. "A Study of the Relationship Between Students and Teacher Cognitive Styles and Grades in Physical Education." Doctoral Dissertation, The Florida State University, August, 1976.
- Schellenberg, James A. An Introduction to Social Psychology, Random House, Inc. 1970.

- Sheriff, Dennis, "A Factor Analysis Study of Hill's Cognitive Style Inventory." DAI. 38 (1978), 4699A (Texas A & M University).
- Thorndike, E. L. The Fundamentals of Learning (New York: Teachers College, Columbia University), 1932.
- Tough, Allen. The Adult Learning Projects. 2nd Ed. Toronto, ONT, Canada. Institute for Studies in Education, 1979.
- Von Fieandt, K. and I. K. Moustgaard. The Perceptual World. Academic Press Inc., London 1977.
- Wepman, Joseph M. "Perceptual Processing Development: Its Relation to Learning Disabilities." Department of Health Education and Welfare, November, 1974.

APPENDIXES

APPENDIX A
PROCEDURES FOR MMPALT II

Coordinators

OUTLINE FOR MEASUREMENT PROCEDURES

INTRODUCTION

1. Explain the measurement (testing) procedures.

YOU ARE ABOUT TO BE MEASURED TO DETERMINE YOUR STRONGEST LEARNING STYLE OR STYLES. SOMETIME AFTER THE MEASUREMENTS ARE COMPLETED, YOU WILL RECEIVE A REPORT IDENTIFYING YOUR STRENGTHS AND WEAKNESSES AS A LEARNER. THIS INFORMATION CAN HELP YOU IN FUTURE LEARNING SITUATIONS.

THE MEASUREMENTS WILL BE CONDUCTED AT FIVE DIFFERENT LOCATIONS. THREE TESTS (PRINT, AURAL, VISUAL) WILL BE CONDUCTED HERE. AFTER FINISHING HERE, YOU WILL BE SENT TO EACH OF FOUR OTHER STATIONS WHERE (people, teachers, etc.) WILL HELP YOU TAKE THE TESTS.

BEFORE DOING ANYTHING FURTHER WE NEED TO DIVIDE YOU INTO GROUPS TO MAKE IT EASIER TO DIRECT YOU TO TEST STATIONS. (Divide subjects into groups of 4 or more as planned for in station organization).

IN EACH OF THE 7 TESTS, YOU WILL FIRST BE PRESENTED 10 PAIRS OF THINGS: WORDS, PICTURES, AROMAS, OBJECTS, ETC. THE FIRST THING PRESENTED TO YOU IN EACH PAIR IS CALLED THE STIMULUS, THE SECOND THE RESPONSE. (Show demonstration pairs and point out stimulus member and response member.) AFTER ALL 10 PAIRS HAVE BEEN PRESENTED TO YOU, THE EVALUATOR WILL THEN PRESENT YOU ONLY THE STIMULUS MEMBER OF EACH PAIR IN A DIFFERENT ORDER THAN YOU EXAMINED THEM ORIGINALLY. YOUR TASK WILL BE TO IDENTIFY FROM MEMORY THE RESPONSE MEMBER WITH WHICH EACH STIMULUS MEMBER WAS ORIGINALLY PAIRED. (demonstrate this test procedure.)

REMEMBER, THERE IS NO PASSING OR FAILING ANY OF THE TESTS. WE ARE SIMPLY TRYING TO FIND YOUR STRENGTHS AND WEAKNESSES SO YOU CAN BECOME BETTER ABLE TO BUILD ON THE STRENGTHS AND IMPROVE IN WEAK AREAS.

SPECIFIC PROCEDURES FOR EACH TEST WILL BE GIVEN TO YOU BY THE EVALUATOR AT EACH STATION.

DO YOU HAVE ANY QUESTIONS?

ADMINISTERING THE MMPALT-II

I. Evaluators

The MMPALT-II requires a minimum of five test administrators. These five administrators are deployed as indicated below:

- Evaluator #1: a) Introduces test and test procedures.
b) Administers print, aural and visual group test.
(At least two of the other evaluators assist in the group testing.)
c) Serves as coordinator for testing of individuals by evaluators 2, 3, 4, 5.

Evaluator #2: Administers the interactive test.

Evaluator #3: Administers the haptic test.

Evaluator #4: Administers the kinesthetic test.

Evaluator #5: Administers the olfactory test.

NOTE: Administration of the individual tests is smoothest when two (2) evaluators are assigned to each individual station.

II. Stations

Five stations are required for testing. They should be quiet rooms or areas free from noise and distraction. No two stations should be placed in the same room. The five stations will be used as follows:

- Station #1 a) Introduction to the testing procedures,
b) Group test administration (print, aural, visual),
c) Coordinating point for subjects.

Station #2: Interactive test

Station #3: Haptic test

Station #4: Kinesthetic test

Station #5: Olfactory test

Stations should be set up by the test administrators before test time in accordance with directions for each test to insure a smooth test procedure.

III. Organization of Subjects

- A. As many as 40 subjects can be introduced to the testing process and administered the group tests (print, aural, visual) at one time in Station #1. However, it is preferable to have smaller groups.
- B. After completing the introduction and group testing at Station #1, organize subjects into groups of four and schedule the groups to begin testing in individual test stations (2-5) at one hour intervals.

NOTE: If multiple sets of tests and evaluators are used in individual test stations, groups can be enlarged accordingly.

- C. Administration of each test requires no more than 15 minutes. At 15 minute intervals, subjects swap stations until each person in a group of four has completed the four individual tests (interactive, haptic, kinesthetic, olfactory). Subjects need to be told at each station by the evaluator where to go next. A coordinator should be available to direct lost or misdirected subjects.
- D. Each set of test materials contains explicit directions for organizing the test station and administering that particular test.

OUTLINE FOR INTRODUCING THE CONCEPT OF LEARNING STYLES

NOTE: The purpose of this introduction is to stimulate each subject's interest and enthusiasm toward learning more about their own individual uniqueness as a learner. Therefore, do not use excessive detail, and adjust presentation to the subject's apparent needs.

1. Develop the following points.

- Each person in the world is different from all others.
- One of the differences in each of us is how we learn.
- Those differences might be in how we receive, process, store, retrieve, or use new knowledge or information.
- One concept of how we receive knowledge and information includes seven learning styles

(Briefly explain each):

Print
Aural
Interactive
Visual
Haptic
Kinesthetic
Olfactory

- Each person should learn more about his/her own learning styles.
- By using our best style we can learn better.
- By knowing our weaknesses we can improve on them.

2. Allow and encourage subject questions and discussion.

3. Proceed to measurement procedures introduction.

ROLE OF THE COORDINATOR

1. Coordinate total testing process.
2. Introduce learning style concepts and test procedures.
3. Conduct print, aural and visual tests at Station #1.
4. Coordinate movement of subjects, groups and individuals from station to station.
5. Assist "lost" subjects.
6. Keep subjects moving from station to station. This may mean changing original schedule and traffic plan, if some evaluators consistently finish before others.
7. Minimize noise and distractions in testing area(s).
8. Collect response sheets from each station.
9. Coordinate preparation of reports on individual students.
10. Coordinate dissemination of test information.

STATION #1
INTRODUCTION AND GROUP TESTS
(PRINT, AURAL, VISUAL)

REQUIREMENTS:

PEOPLE: 2 trained evaluators

EQUIPMENT: 1 35 mm Kodak Carousel Slide projector
1 projection screen
1 audiotape cassette recorder

MMPLAT-II MATERIALS: Tray of slides (Print, Visual Tests)
Audio-cassette (Aural Test)
Demonstration materials: wooden block and baseball,
two vials, blindfold
Pencils
Response Sheets: Print, Aural, Visual

PROCEDURES:

- A. INTRODUCTION:
- 1) Welcome subjects
 - 2) Introduce concept of learning styles
 - 3) Explain and demonstrate measurement procedures
 - 4) Organize test groups (groups of 4)
 - 5) Respond to Questions
- B. PRINT TEST:
- 1) Be sure subjects can all see screen clearly
 - 2) Distribute response sheets (face down) and pencils
 - 3) Give directions and show sample pair
 - 4) Display stimulus/response pairs at 7 second intervals
 - 5) Instruct subjects to turn response sheets over and pick up pencils
 - 6) Announce number of response and display each stimulus slide for 10 seconds. (For example: "Number one (wait 10 seconds), Number two (wait 10 seconds) etc...")
 - 7) Collect response sheets

NOTE: Pairings and sequence of stimulus/response pairs should be as follows:
Sample: hez/sister

- | | |
|--------------|--------------|
| 1) biv/cat | 6) cyc/horse |
| 2) ceq/party | 7) koy/rain |
| 3) puq/name | 8) wuq/robin |
| 4) dup/bed | 9) lez/paper |
| 5) xib/box | 10) nyh/coat |

Sequence for stimulus only display:

- | | |
|--------|---------|
| 1) dup | 6) nyh |
| 2) cyc | 7) ceq |
| 3) koy | 8) lez |
| 4) biv | 9) puq |
| 5) xib | 10) wuq |

- C. AURAL TEST: 1) Be sure subjects can all hear audiotape well.
- 2) Distribute response sheets face down.
 - 3) Give directions for the test and demonstrate stimulus/response pair.
 - 4) Play audiotape containing stimulus/response pairs.
 - 5) Instruct subjects to turn response sheets over and prepare to respond.
 - 6) Play audiotape containing stimulus member only (2nd section of audiocassette).

NOTE: Pairings and sequence of stimulus/response pairs should be as follows:

- | | |
|---------------|---------------|
| 1) vom/apple | 6) poh/leg |
| 2) und/baby | 7) omp/bread |
| 3) tud/kitten | 8) mog/table |
| 4) sul/shoe | 9) kiv/rabbit |
| 5) roz/duck | 10) jus/bird |

Sequence for stimulus only presentation:

- | | |
|--------|---------|
| 1) poh | 6) mog |
| 2) omp | 7) und |
| 3) jus | 8) sul |
| 4) vom | 9) kiv |
| 5) tud | 10) roz |

- D. VISUAL TEST: 1) Be sure subjects can all see the screen well.
- 2) Distribute response sheets (face down).
 - 3) Give directions and show sample pair.

- 4) Display stimulus/response pairs at 7 second intervals.
- 5) Instruct subjects to turn response sheets over and prepare to respond.
- 6) Announce number of response and display each stimulus member for 10 seconds. (For example: "Number one (ten seconds), etc...")
- 7) Collect answer sheets and pencils.

NOTE: Pairing and sequence of stimulus/response pairs should be as follows:

- | | |
|---------------------|------------------------------|
| 1) square/tree | 6) star/boat |
| 2) circle/hat | 7) oval/flower |
| 3) triangle/chair | 8) asterisk/umbrella |
| 4) rectangle/boot | 9) diamond/scissors |
| 5) plus sign/window | 10) infinity sign/eyeglasses |

Sequence for stimulus only display:

- | | |
|------------------|--------------|
| 1) asterisk | 6) oval |
| 2) circle | 7) diamond |
| 3) plus sign | 8) square |
| 4) rectangle | 9) star |
| 5) infinity sign | 10) triangle |

- DISMISSAL: 1) Be sure subjects have their group assignments.
- 2) Direct subject groups to next location(s).

STATION #2
INTERACTIVE TEST

REQUIREMENTS:

- PEOPLE: 1-2 trained evaluators
- EQUIPMENT: This document and response sheets.

PROCEDURES:

1. Seat subject where he/she is at the same level and face to face with primary evaluator. If a secondary evaluator is used, he/she should sit to one side and prepare to score the responses. Scoring must be accomplished without distracting or prompting the subject.
2. Try to put the subject at ease, but do not waste too much time in pleasantries.
3. Assure subject that procedures are identical to those already encountered in the group tests and give him/her directions for the test:

EVALUATOR: IN A MOMENT YOU WILL BE BLINDFOLDED, THEN YOU WILL BE GIVEN TEN PAIRS OF WORDS. EACH PAIR CONTAINS A NONSENSE WORD AND A COMMON WORD. AFTER PRESENTING EACH PAIR, I SHALL GIVE YOU AN OPPORTUNITY TO TALK ABOUT HOW YOU INTEND TO REMEMBER THIS PAIRING. AFTER ALL TEN PAIRS OF WORDS HAVE BEEN PRESENTED AND YOU HAVE COMMENTED ON EACH, I SHALL PRESENT YOU ONLY THE STIMULUS OR NONSENSE WORDS AND ASK YOU TO SUPPLY THE COMMON WORD WHICH WAS PAIRED WITH EACH. DO YOU UNDERSTAND THE PROCEDURE?

4. Present stimulus/response pairs using the following script:

THE NONSENSE WORD IN THIS PAIR IS (STIMULUS), AND THE COMMON WORD IS (RESPONSE). PLEASE REPEAT BOTH WORDS.

(Repeat as necessary until subject can say both words.)

How will you remember this pair of words? (you may need to prompt the subject to be sure that he/she will verbalize these words)

(Allow ten (10) seconds for subject to respond to question.)
(Do not comment on subject's reply.)

NOTE: Pairings and sequence of stimulus/response pairs should be as follows:

- | | |
|------------------|--------------|
| 1) zed/wind | 6) pex/floor |
| 2) fai/tooth | 7) chi/egg |
| 3) ces/ball | 8) jec/dog |
| 4) hez/Christmas | 9) toz/milk |
| 5) sci/fire | 10) zon/toy |

5. Present stimulus words and ask the subject to state response words. Use the following script:

THE NONSENSE WORD IS (STIMULUS). WHAT WAS (STIMULUS) PAIRED WITH?

(Allow 10 seconds for the response.)

NOTE: Sequence for stimulus only presentation:

- | | |
|--------|---------|
| 1) hez | 6) jec |
| 2) zed | 7) toz |
| 3) sci | 8) ces |
| 4) chi | 9) pex |
| 5) fai | 10) zon |

6. Primary or secondary evaluator completes scoring without reporting results to subject.
7. Be sure subject's correct name or number is on the score sheet.
8. Instruct subject to move to his/her next station or return to the coordinator for reassignment.

STATION #3
HAPTIC TEST

REQUIREMENTS:

PEOPLE: 1-2 trained evaluators

EQUIPMENT: Small desk or table
Box of 20 stimulus/response items
Blindfold
Response sheets

PROCEDURES:

1. Arrange items on table and cover before subject enters.
2. Seat subject across table from primary evaluator. If a secondary evaluator is used, he/she should sit to one side and prepare to score the responses. Scoring must be accomplished without distracting or prompting the subject.
3. Try to put the subject at ease, but do not waste too much time on pleasantries.
4. Assure subject that procedures are the same as for all of the other tests and give him/her directions as follows:

EVALUATOR: IN A MOMENT YOU WILL BE BLINDFOLDED. THEN I SHALL PRESENT YOU WITH TEN PAIRS OF ITEMS. EACH PAIR CONTAINS A NONSENSE ITEM AND A COMMON ITEM. NONE OF THE ITEMS WILL HURT YOU NOR FEEL TERRIBLE TO YOU. I SHALL ALWAYS PLACE THE NONSENSE ITEM OF EACH PAIR IN YOUR LEFT HAND, AND THE COMMON ITEM IN YOUR RIGHT HAND. FEEL THE TWO ITEMS IN EACH PAIR CAREFULLY SO THAT YOU WILL BE ABLE TO REMEMBER WHAT THINGS ARE ASSOCIATED WITH EACH OTHER. I WILL MAKE SURE THAT YOU CAN IDENTIFY THE COMMON ITEM. AFTER ALL TEN PAIRS HAVE BEEN PRESENTED, I SHALL PRESENT YOU ONLY THE STIMULUS OR NONSENSE ITEMS AND ASK YOU TO IDENTIFY THE COMMON ITEM WHICH WAS PAIRED WITH EACH. DO YOU UNDERSTAND THE PROCEDURE?

5. Blindfold subject and uncover items on the table.
6. Place stimulus member of each pair in subject's left hand; then place corresponding response item in subject's right hand. Allow the subject 7 seconds to handle both objects, then take them from him/her and repeat the procedure with the next pair of items. Be sure subject can identify the common item. He/she will have to name it later.
7. After presenting all ten stimulus/response pairs, instruct the subject that the test is about to begin.
8. Place each stimulus member in the subjects left hand and ask him/her to identify the paired response item:

PLEASE NAME OR DESCRIBE THE OBJECT WITH WHICH THIS ITEM WAS PAIRED?

(Allow ten (10) seconds for the subject to reply. Do not comment on the subject's reply.)

9. Score is kept without reporting results to the subject.

NOTE: Pairings and sequence of stimulus/response pairs should be as follows:

- | | |
|------------------------------|------------------------------|
| 1) carpet/lightbulb | 6) bushing/key ring |
| 2) rock/pencil | 7) metal tube/scissors |
| 3) table leg/tennis ball | 8) odd shaped wood/yo yo |
| 4) hose coupling/paint brush | 9) plastic golf ball/padlock |
| 5) wood rectangle/table fork | 10) door knob/drinking glass |

Sequence for stimulus only presentation:

- | | |
|--------------------|-------------------|
| 1) carpet | 6) wood rectangle |
| 2) golf ball | 7) rock |
| 3) odd shaped wood | 8) door knob |
| 4) bushing | 9) metal tube |
| 5) table leg | 10) hose coupling |

10. Be sure that subject's correct name or number is on response sheet.
11. Instruct subject to move to his/her next station or to return to coordinator for reassignment.

STATION #4

KINESTHETIC TEST

REQUIREMENTS:

- PEOPLE: 1-2 Trained evaluators
- EQUIPMENT: This document
blindfold
response sheet

PROCEDURES:

1. Seat subject for a few minutes while explaining test. If a secondary evaluator is used, he/she should sit to one side and prepare to score the responses. Scoring must be accomplished without distracting or prompting the subject.
2. Try to put the subject at ease, but do not waste too much time on pleasantries.
3. Assure subject that procedures are the same as for all other tests and give him/her directions as follows:

EVALUATOR: THIS TEST INVOLVES BODY MOVEMENT: THERE WILL BE LIMITED SPOKEN DIRECTIONS DURING THIS PROCEDURE. FROM THIS (IDENTIFY) STARTING POINT, I'LL GUIDE AND DIRECT YOU THROUGH TEN PAIRS OF BODY MOVEMENTS. YOU WILL BE BLINDFOLDED: THEREFORE I'LL STAY CLOSE BY YOU TO KEEP YOU STEADY AND PREVENT ANY ACCIDENTS. AFTER WE HAVE COMPLETED THE TEN PAIRS OF MOVEMENTS, I'LL GUIDE AND DIRECT YOU THROUGH THE FIRST MOVEMENT OF EACH PAIR. YOU ARE TO RESPOND BY PERFORMING OR DESCRIBING THE MOVEMENT WITH WHICH THE FIRST MOVEMENT WAS PAIRED. DO YOU UNDERSTAND THE PROCEDURE?

4. Blindfold the subject;
5. Move subject through the 10 stimulus/response pairs. As necessary, use the following spoken directions:

THE FIRST MOVEMENT IS (STIMULUS). IT IS PAIRED WITH (RESPONSE)

Start each movement by gently placing your hands on the subject's shoulders. The various movements will require gentle movement of the subject's arms and legs. This must be accomplished without alarming the subject in any way. As necessary, you may use additional verbal directions, but those directions must not detract from the actual movements.

6. Move the subject through the various stimulus movements and allow 10 seconds for the subject to respond by performing or describing the paired movements. It may be necessary to say:

THIS MOVEMENT IS (STIMULUS). WHAT WAS IT PAIRED WITH?

7. Score responses without reporting results to the subject.
8. Be sure that the subject's correct name or number is on the response sheet.
9. Instruct subject to move to his/her next station or to return to coordinator for reassignment.

NOTE: Pairings and sequence pairs should be as follows:

<u>STIMULUS</u>	<u>RESPONSE</u>
1) Move diagonally across room and back	1) Stoop
2) Stand on one leg	2) Raise both hands into air
3) Rotate left arm	3) Bend forward at waist
4) Hands on hips	4) Alternate raising both legs
5) Wrap left arm over head	5) Walk in circle
6) Clasp hands above head then lower to sides	6) Take two steps forward and return
7) Twist body in circle	7) Clasp hands in front of body
8) With right arm, draw a circle in the air	8) Stand with legs spread far apart
9) Cross arms over head	9) Clasp hands behind neck
10) Get on hands and knees	10) Stand at attention (rigid body position)

Sequence for stimulus only presentation:

- 1) Stand on one leg
- 2) Get on hands and knees
- 3) With right arm, draw circle in air
- 4) Cross arms over head
- 5) Hands on hips
- 6) Move diagonally across room and return
- 7) Clasp hands above head then lower to sides
- 8) Left arm above head
- 9) Twist body in circle
- 10) Rotate left arm

STATION #5

OLFACTORY TEST

REQUIREMENTS:

- PEOPLE: 1-2 trained evaluators
- EQUIPMENT: Small desk or table
Aroma vials or bottles (20)
Blindfold
Response sheets

PROCEDURES:

1. Arrange aroma bottles on table and cover.
2. Seat subject across table from primary evaluator. If a secondary evaluator is used, he/she should sit to one side and prepare to score the responses. Scoring must be accomplished without distracting or prompting the subject.
3. Try to put the subject at ease, but do not waste too much time on pleasantries.
4. Assure subject that procedures are the same as for all other tests and give him/her directions as follows:

EVALUATOR: FOR THIS TEST YOU WILL BE BLINDFOLDED AND GIVEN BOTTLES CONTAINING DIFFERENT AROMAS. FIRST, YOU WILL BE PRESENTED WITH PAIRS OF AROMAS. THE FIRST BOTTLE OF EACH PAIR CONTAINS AN ABSTRACT AROMA WHICH WILL NOT BE IDENTIFIED. THE SECOND BOTTLE CONTAINS A COMMON AROMA, AND I WILL IDENTIFY IT FOR YOU. YOUR TASK IS TO REMEMBER WHICH PAIRS OF AROMAS GO TOGETHER. AFTER EXAMINING ALL TEN PAIRS, YOU WILL BE GIVEN THE BOTTLE CONTAINING THE FIRST AROMA IN EACH PAIR. YOU ARE TO IDENTIFY THE NAME OF THE AROMA WITH WHICH IT WAS PAIRED. DO YOU UNDERSTAND THE PROCEDURE?

5. Blindfold the subject.
6. Present the stimulus/response pairs as follows:

THIS IS THE FIRST AROMA OF THIS PAIR. (Give bottle to subject; help him/her lift it to nose.) THIS IS THE SECOND AROMA OF THIS PAIR (Same procedure).

Allow the subject 7 seconds to examine each pair of aromas.

7. Present subject with stimulus member bottle of each pair and allow him/her 10 seconds to identify the appropriate response aroma. It may be necessary to say:

THIS ONE OF THE ABSTRACT AROMAS; WHAT WAS IT PAIRED WITH?

8. Score responses without reporting results to the subject.
9. Be sure subject's correct name or number is on the response sheet.
10. Instruct subject to move to his/her next station or to return to coordinator for reassignment.

NOTE: Pairings and sequence of stimulus/response pairs should be as follows:

- | | |
|-----------------|----------------------|
| 1) Cherry | 11) Peppermint |
| 2) Vanilla | 12) Strawberry |
| 3) Almond | 13) Orange |
| 4) Raspberry | 14) Butter |
| 5) Pineapple | 15) Chocolate |
| 6) Brandy | 16) Coconut |
| 7) Rum | 17) Anise (licorice) |
| 8) Banana | 18) Cloves |
| 9) Maple | 19) Lemon |
| 10) Wintergreen | 20) Cinnamon |

Sequence for stimulus only presentation:

- | | |
|-------------------|-----------------------|
| 1) Vanilla (#2) | 6) Almond (#3) |
| 2) Raspberry (#4) | 7) Pineapple (#5) |
| 3) Maple (#9) | 8) Rum (#7) |
| 4) Banana (#8) | 9) Brandy (#6) |
| 5) Cherry (#1) | 10) Wintergreen (#10) |

APPENDIX B

PERCEPTUAL MODALITY PREFERENCE SURVEY

1 2 3 4 5
ALWAYS USUALLY SELDOM NEVER DO NOT MARK

1. I can learn better by reading than by listening.
2. I can learn better by listening than by talking with others.
3. I can learn better by talking with others than by looking at things like movies and slides.
4. I can learn better by looking at things like movies and slides than by touching or holding objects.
5. I can learn better by touching or holding objects than by physically participating in activities such as sports or games.
6. I can learn better by physically participating in activities such as sports and games than by smelling things.
7. I can learn better by smelling things than by reading.
8. I can learn better by reading than by talking with others.
9. I can learn better by talking with others than by touching or holding objects.
10. I can learn better by touching or holding objects than by smelling things.
11. I can learn better by smelling things than by listening.
12. I can learn better by listening than by looking at things like movies and slides.
13. I can learn better by looking at things like movies and slides than by physically participating in activities such as sports and games.
14. I can learn better by physically participating in activities such as sports and games than by reading.
15. I can learn better by reading than by looking at things like movies and slides.
16. I can learn better by looking at things like movies and slides than by smelling things.
17. I can learn better by smelling things than by talking with others.
18. I can learn better by talking with others than by physically participating in activities such as sports and games.
19. I can learn better by physically participating in activities such as sports and games than by listening.

- | 1 | 2 | 3 | 4 | 5 |
|--------|---------|--------|-------|-------------|
| ALWAYS | USUALLY | SELDOM | NEVER | DO NOT MARK |
20. I can learn better by listening than by touching or holding objects.
 21. I can learn better by touching or holding objects than by reading.
 22. I can learn better by reading than by smelling things.
 23. I can learn better by smelling things than by physically participating in activities such as sports and games.
 24. I can learn better by physically participating in activities such as sports and games than by touching or holding objects.
 25. I can learn better by touching or holding objects than by looking at things like movies and slides.
 26. I can learn better by looking at things like movies and slides than by talking with others.
 27. I can learn better by talking with others than by listening.
 28. I can learn better by listening than by reading.
 29. I can learn better by reading than by physically participating in activities such as sports and games.
 30. I can learn better by physically participating in activities such as sports and games than by looking at things like movies and slides.
 31. I can learn better by looking at things like movies and slides than by listening.
 32. I can learn better by listening than by smelling things.
 33. I can learn better by smelling things than by touching or holding objects.
 34. I can learn better by touching or holding objects than by talking with others.
 35. I can learn better by talking with others than by reading.
 36. I can learn better by reading than by touching or holding objects.
 37. I can learn better by touching or holding objects than by listening.
 38. I can learn better by listening than by physically participating in activities such as sports and games.
 39. I can learn better by physically participating in activities such as sports and games than by talking with others.

5

1 2 3 4 5
ALWAYS USUALLY SELDOM NEVER DO NOT MARK

40. I can learn better by talking with others than by smelling things.
41. I can learn better by smelling things than by looking at things like movies and slides.
42. I can learn better by looking at things like movies and slides than by reading.

APPENDIX C

PERMISSION TO USE MMPALT II AND PMPS



Robert L. McElrath
COMMISSIONER

TENNESSEE
STATE DEPARTMENT OF EDUCATION
100 CORDELL HULL BUILDING
NASHVILLE 37219

November 23, 1983

Dr. Wayne James
Occupational and Adult Education
406 Classroom Building
Oklahoma State University
Stillwater, Oklahoma 74074

Dear Wayne:

I am writing to confirm that you have permission of the authors of The MMPACT-II Learning Style Test, to administer the tests, and use the results in a series of doctoral dissertations to be conducted at Oklahoma State University. We are pleased that you are furthering our research. We shall look forward to obtaining the results of your research.

Cordially,

A handwritten signature in cursive script that reads "Russ French".

Russell L. French

For the Authors: Russell L. French and Edwin Cherry

RLF:clh

APPENDIX D

INTRODUCTION TO THE LEARNING STYLES

MEASUREMENT EXERCISES

INTRODUCTION

LEARNING STYLE MEASUREMENT EXERCISES

During your staff development meeting on Wednesday, you will be completing several learning exercises to determine your strongest learning styles or styles. After the exercises are completed, you will be advised as to your strengths and weaknesses as a learner. It is hoped this knowledge will be helpful to you in future learning situations.

Because we are all different, we have differences in the manner in which we learn. This can be noted through the manner in which we receive, process, retrieve, or use new knowledge or information.

One concept of how we receive knowledge and information includes seven learning styles. These are print, aural, interactive, visual, haptic, kinesthetic, and olfactory. In an effort to help each of you better know your strongest style seven exercises will test those learning styles. In each of the seven exercises, you will be presented 10 pairs of things using different learning styles. Coordinators will help you determine your strength in that learning style.

Remember there is no passing or failing of these exercises. We are simply trying to find your strengths and weaknesses so you can become better able to build on the strengths and improve the weak areas.

APPENDIX E

DEMOGRAPHIC FORM

LEARNING STYLE STUDY - SUBJECTS' RECORD FORM

Name Subject Number

POSITION: Administrator ___; Counselor(CYS) ___; Counselor(Shelter) ___;
Counselor (Both CYS/Shelter) ___; Support Person ___

How long have you been in Social Services _____

AGE _____ SEX _____ SINGLE _____ MARRIED _____

WHERE WERE YOU BORN _____: RURAL ___; URBAN ___; SUBURAN ___

WHERE WERE YOU RAISED _____: RURAL ___; URBAN ___; SUBURAN ___

DO YOU HAVE ANY OF THE FOLLOWING PHYSICAL HANDICAPS:

VISUAL _____ HEARING _____ PHYSICAL _____

EDUCATION COMPLETED:

- | | |
|------------------------------|----------------------------------|
| _____ 1. Some High School | Where did you get degrees? _____ |
| _____ 2. High School Diploma | _____ |
| _____ 3. Some College | Are You Right Handed _____ |
| _____ 4. Bachelor's Degree | Are You Left Handed _____ |
| _____ 5. Master's Degree | Do You Smoke? _____ |
| _____ 6. Doctor's Degree | |

Are you currently enrolled in any adult learning program. If so, what
_____, Where _____

TOTAL FAMILY INCOME
(Specify number of contributors)

NUMBER OF CHILDREN

- | | |
|--------------------------|--------------------------|
| 1. _____ below \$20,000. | 1. _____ None |
| 2. _____ below \$25,000. | 2. _____ Under 6 yrs old |
| 3. _____ below \$30,000. | 3. _____ 6 - 12 yrs old |
| 4. _____ below \$40,000. | 4. _____ 12 = 17 yrs old |
| 5. _____ below \$50,000. | 5. _____ 18 - 22 yrs old |
| 6. _____ above \$50,000. | 6. _____ Over 22 yrs old |

APPENDIX F

RESPONSE SHEETS FOR MMPALT II

RESPONSE SHEET A
PRINT
LEARNING STYLE

SUBJECT NAME/NUMBER: _____

NONSENSE WORD NUMBER:	COMMON WORD:
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____

RESPONSE SHEET B
AURAL
LEARNING STYLE

SUBJECT NAME/NUMBER: _____

NONSENSE WORD NUMBER:	COMMON WORD:
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____

RESPONSE SHEET C
VISUAL
LEARNING STYLE

SUBJECT NAME/NUMBER: _____

SYMBOL NUMBER:	PICTURE:
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____

TOTAL CORRECT: _____

RESPONSE SHEET
INTERACTIVE D
LEARNING STYLE

SUBJECT NAME/NUMBER: _____

NONSENSE WORD:	COMMON WORD:	SUBJECT CORRECT	RESPONSE INCORRECT
hez	_____		
zed	_____		
sci	_____		
chi	_____		
fai	_____		
jec	_____		
toz	_____		
ces	_____		
pex	_____		
zon	_____		

TOTAL CORRECT: _____

RESPONSE SHEET E
HAPTIC
LEARNING STYLE
SUBJECT NAME/NUMBER: _____

STIMULUS MEMBER:	RESPONSE MEMBER:	SUBJECT CORRECT	RESPONSE INCORRECT
PIECE OF CARPET	LIGHT BULB		
PLASTIC GOLF BALL	PADLOCK		
ODD SHAPED PIECE OF WOOD	YO YO		
BUSHING	KEY RING		
TABLE LEG	TENNIS BALL		
WOODEN RECTANGLE	TABLE FORK		
ROCK	PENCIL		
DOOR KNOB	DRINKING GLASS		
METAL TUBE	SCISSORS		
HOSE COUPLING	PAINT BRUSH		

TOTAL CORRECT: _____

RESPONSE SHEET F
KINESTHETIC
LEARNING STYLE
SUBJECT NAME/NUMBER: _____

STIMULUS MEMBER:	RESPONSE MEMBER:	SUBJECT CORRECT	RESPONSE INCORRECT
STAND ON ONE LEG	HANDS IN AIR		
GET ON HANDS AND KNEES	STAND AT ATTENTION		
WITH RIGHT ARM, DRAW AN 'O' IN THE AIR	STAND SPREAD EAGLE		
CROSS ARMS OVER HEAD	HANDS BEHIND HEAD		
HANDS ON HIPS	RAISE BOTH LEGS (ALT.)		
MOVE DIAGONALLY ACROSS ROOM AND RETURN	STOOP		
CLASP HANDS OVER HEAD, LOWER TO SIDE	TAKE TWO STEPS FWD AND RETURN		
LEFT ARM OVER HEAD	WALK IN A CIRCLE		
TWIST BODY IN CIRCLE	CLASP IN FRONT		
ROTATE LEFT ARM	BEND OVER FORWARD		

RESPONSE SHEET G
 OLFACTORY
 LEARNING STYLE
 SUBJECT NAME/NUMBER: _____

STIMULUS NUMBER:	RESPONSE AROMA:	SUBJECT CORRECT	RESPONSE INCORRECT
2	STRAWBERRY		
4	BUTTER		
9	LEMON		
8	OIL OF CLOVES		
1	PEPPERMINT		
3	ORANGE (OIL)		
5	CHOCOLATE		
7	LICORICE		
6	COCONUT		
10	CINNAMON		

TOTAL CORRECT: _____

RESPONSE SHEET H
 PARTICIPANT'S INITIAL REPORT
 SUBJECT NUMBER: _____

The individual survey tests have been scored, and your results on the MMPALT are as follows.

LEARNING STYLE	SCORE	RANK ORDER
PRINT	_____	_____
AURAL	_____	_____
INTERACTIVE	_____	_____
VISUAL	_____	_____
HAPTIC	_____	_____
KINESTHETIC	_____	_____
OLFACTORY	_____	_____

If these results are a true reflection of your strengths as a learner, the style ranked #1 is your best method for studying and learning. Therefore, you might consider using that style as much as possible, and, at the same time, improve your skills in the other styles. Example: If aural is #1, you can learn best by listening. If print is #7, try to improve your reading skills.

Comments:

APPENDIX G

INTRODUCTION FOR THE PMPS SURVEY

INTRODUCTION TO PMPS SURVEY

This survey is designed to help you identify your style of learning. It specifically deals with how you best receive new information or knowledge. The results of this survey will help you plan your future learning experiences.

You will be responding to forty-two statements concerning how you learn best. This is not a test; there are no right or wrong answers. When making your responses, you should consider your past learning experiences and your own intuitions about your learning style.

The response choices are: ALWAYS, USUALLY, SELDOM, and NEVER. The always response indicates that the statement is a strong representation of your learning style preference. If the statement is a good way for you to learn, but not your most preferred, you should mark "usually". If the statement indicates a way you can learn, but you would prefer other methods, mark your response as "seldom". The never response indicates that you reject that statement as a way for you to learn.

The construction of the survey requires that you respond to all statements in the order presented. Therefore, do not omit responses or skip statements.

If you are using the machine scored response sheet, mark column 1 for always, column 2 for usually, column 3 for seldom, and column 4 for never.

APPENDIX H

WORKSHEET FOR HAND-SCORING PERCEPTUAL
MODALITY SURVEY

WORKSHEET FOR HAND-SCORING
PERCEPTUAL MODALITY SURVEY

Print:		Aural:		Interactive:	
A 1	28	I 2	27	V 3	26
I 8	35	V 12	31	H 9	34
V 15	42	H 20	37	K 18	39
H 36	21	K 38	19	O 40	17
K 29	14	O 32	11	P 35	8
O 22	7	P 28	1	A 27	2

Visual:		Haptic:		Kinesthetic:	
H 4	25	K 5	24	O 6	23
K 13	30	O 10	33	P 14	29
O 16	41	P 21	36	A 19	38
P 42	15	A 37	20	I 39	18
A 31	12	I 34	9	V 30	13
I 26	3	V 25	4	H 24	5

Olfactory:		Style:		Survey Results:		MMPALT Results:	
P	Score	Print	Aural	Score:	Rank:	Score:	Rank:
P 7	22	Print					
A 11	32	Aural					
I 17	40	Interactive					
V 41	16	Visual					
H 33	10	Haptic					
K 23	6	Kinesthetic					
		Olfactory					

Primary Position: Always +4, Usually +2, Seldom -2, Never -4

Secondary Position: Always -2, Usually -1, Seldom +1, Never +2

APPENDIX I

SIGN-UP SHEET

SIGN-UP SHEET

TO: Linda Rice
2404 Sunset Drive
El Reno, Oklahoma 73036

I have read the introduction to the learning styles measurement project, and I would like to be a participant in the project.

Name: _____

Address: _____

Telephone Number: _____

Signature: _____

APPENDIX J

SUMMARY OF DEMOGRAPHIC DATA

DEMOGRAPHIC DATA

	Subject Number													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Position	5	3	2	2	2	5	5	1	2	1	1	1	1	1
Years' Experience	4	2	3	1	3	1	2	9	1	2	2	5	6	12
Age	33	34	29	41	44	59	29	37	34	38	31	39	33	39
Sex	F	F	M	F	F	F	F	M	F	M	F	M	M	M
Marital Status	M	M	S	M	M	S	M	M	M	M	M	M	M	S
Birth	R	R	R	R	R	R	R	U	U	S	S	U	R	R
Reared	U	U	R	R	R	R	R	U	U	S	S	U	R	U
Education	3	5	5	5	5	1	3	3	5	4	6	6	4	3
College	N/A	S	S	L	S	N/A	N/A	N/A	S	L	S	S	S	N/A
Hand	R	R	L	R	R	R	R	R	R	L	R	R	R	R
Continued Education	N	N	N	Y	N	N	N	N	N	N	N	N	N	Y
Income	3	5	1	6	5	1	3	6	6	6	6	6	6	3
# of Contributors	2	2	1	1	2	1	2	2	1	2	2	2	2	1
# of Children	2	2	0	2	2	8	0	1	1	2	1	3	1	0
Handicap	V	N	N	N	N	N	N	Y	N	V	N	V	N	V
Smoke	N	Y	N	Y	N	N	Y	N	N	N	Y	Y	N	Y

** El Reno Site

DEMOGRAPHIC DATA

	Subject Number													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Position	2	5	3	3	3	3	5	3	3	5	5	3	5	5
Years' Experience	10	3	4	0	2	10	2	4	7	7	7	4	2	8
Age	36	39	27	32	22	27	23	22	29	35	29	27	27	25
Sex	M	F	M	M	M	F	M	F	F	F	F	F	F	F
Marital Status	S	M	S	M	S	S	M	M	S	S	S	S	M	S
Birth	R	U	S	U	U	R	U	R	S	U	R	S	R	U
Reared	R	U	S	U	U	R	U	R	R	R	R	R	R	U
Education	5	4	4	4	3	4	4	3	4	4	4	4	4	4
College	S	L	S	S	N/A	S	S	N/A	S	S	S	S	M	S
Hand	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Continued Education	-	N	Y	N	N	N	N	N	N	N	N	Y	Y	N
Income	1	5	1	1	1	1	3	3	1	1	2	1	5	1
# of Contributors	1	2	1	1	1	1	2	2	1	1	2	1	2	1
# of Children	1	3	0	3	0	0	0	0	0	0	1	0	2	0
Handicap	N	x	x	x	N	N	N	N	N	x	x	N	N	x
Smoke	N	N	Y	Y	Y	N	N	N	N	Y	Y	N	Y	N

** Enid sites

DEMOGRAPHIC DATA

	Subject Number				
	1	2	3	4	5
Position	2	21	2	3	5
Years' Experience	10	4	13	5	2
Age	34	33	35	29	59
Sex	F	F	M	F	M
Marital Status	M	S	M	S	M
Birth	U	S	U	S	R
Reared	U	S	U	S	R
Education	5	5	5	4	5
College	L	L	L	L	L
Hand	R	R	R	R	R
Continued Education	N	Y	N	Y	Y
Income	5	3	4	2	5
# of Contributors	2	1	2	1	1
# of Children	1	0	1	0	2
Handicap	N	N	N	N	N
Smoke	Y	N	N	Y	Y

** Norman

DEMOGRAPHIC DATA

	Subject Number			
	1	2	3	4
Position	1	1	1	3
Years' Experience	2	11	11	7
Age	29	40	38	37
Sex	F	M	M	M
Marital Status	M	M	M	M
Birth	R	U	R	R
Reared	R	U	R	R
Education	4	5	5	5
College	S	S	S	S
Hand	R	L	R	R
Continued Education	N	N	N	N
Income	4	3	3	2
# of Contributors	2	1	1	1
# of Children	1	4	1	3
Handicap	N	N	N	x
Smoke	Y	N	N	N

** El Reno Cluster Site

DEMOGRAPHIC DATA

	Subject Number		
	1	2	3
Position	2	3	5
Years' Experience	1	2	1
Age	54	25	53
Sex	F	F	F
Marital Status	M	S	M
Birth	U	U	U
Reared	S	R	S
Education	4	4	3
College	L	S	N/A
Hand	R	R	R
Continued Education	N	N	N
Income	6	1	4
# of Contributors	2	1	2
# of Children	4	0	3
Handicap	N	H	N
Smoke	N	Y	Y

** Shawnee Site

Key for Demographic Data

Position:

1. Administration
2. Community Youth Service
Counselor
3. Emergency Shelter Counselor
4. CYSC/ESC-Both

Birth and Raised:

- R = Rural
U = Urban
S = Suburban

Handicaps:

- V = Visual
H = Hearing
N = No Handicaps

Education Completed:

1. Some High School
2. High School Diploma
3. Some College
4. Bachelor's Degree
5. Master's Degree
6. Doctor's Degree

Smoke:

- N = No
Y = Yes

Sex:

- M = Male
F = Female

Marital Status

- M = Married
S = Single

College:

- S = 10-20,000
M = 20-30,000
L = 30-40,000

Total Family Income:

1. Below 20
2. Below 25
3. Below 30
4. Below 40
5. Below 50
6. Below 60

Handiness:

- R = Right
L = Left

Continued Education:

- N = No
Y = Yes

APPENDIX K

SUMMARY OF INDIVIDUAL RANKS AND SCORES
FOR THE MMPALT II AND THE
PMPS SURVEY

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	MMPALT	6	4	7	3	2	6	10	1	8	2	4	5	1	7
	PMPS	-6	5	+15	2	+21	1	+13	3	+12	4	-13	6	-46	7
2	MMPALT	10	1.5	7	3	6	4	10	1.5	5	5.5	5	5.5	1	7
	PMPS	+14	2	+23	1	+12	4	+13	3	-16	5.5	-16	5.5	-27	7
3	MMPALT	1	6	1	6	3	2	3	2	2	4	3	2	1	6
	PMPS	+6	3.5	+15	2	+21	1	+6	3.5	-15	6	0	5	-26	7
4	MMPALT	10	1.5	9	3.5	9	3.5	10	1.5	7	5	5	6	2	7
	PMPS	+19	1.5	+5	3	+19	1.5	+1	4	-11	6	-1	5	-35	7
5	MMPALT	5	4	8	3	1	7	9	1.5	9	1.5	4	5	2	6
	PMPS	-3	5	-16	6	+11	2	+7	3	+1	4	+29	1	-36	7
6	MMPALT	1	4	2	3	0	6	0	6	4	1	3	2	0	6
	PMPS	+18	1	-19	7	+14	2.5	+5	4	+1	5	+14	2.5	-16	6
7	MMPALT	3	4.5	3	4.5	1	6.5	9	1	4	3	6	2	1	6.5
	PMPS	+4	2	-1	3	+6	1	-5	4	-10	6	-7	5	-26	7
8	MMPALT	4	5.5	7	2	6	3	8	1	5	4	4	5.5	0	7
	PMPS	-15	5	+4	4	+5	3	+8	2	-18	6	+33	1	-24	7

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print Score	Print Rank	Aural Score	Aural Rank	Interactive Score	Interactive Rank	Visual Score	Visual Rank	Haptic Score	Haptic Rank	Kinesthetic Score	Kinesthetic Rank	Olfactory Score	Olfactory Rank
9	MMPALT	7	1.5	5	3.5	5	3.5	7	1.5	4	5.5	4	5.5	3	7
	PMPS	+22	1	+3	4	+9	3	+15	2	-15	6	-3	5	-36	7
10	MMPALT	6	4	5	5.5	7	2.5	9	1	5	5.5	7	2.5	2	7
	PMPS	0	4	+10	2	-6	5	+9	3	-8	6	+18	1	-19	7
11	MMPALT	7	5	7	5	7	5	10	1	8	3	9	2	4	7
	PMPS	+22	1	+7	3	0	4.5	0	4.5	+8	2	-14	6	-20	7
12	MMPALT	0	7	4	1	2	3.5	3	2	2	3.5	1	5.5	1	5.5
	PMPS	+14	3	+15	1.5	+15	1.5	+13	4	-15	6	+11	5	-31	7
13	MMPALT	5	2	7	1	1	6	3	4.5	3	4.5	4	3	0	7
	PMPS	-18	7	+1	5	+6	3	-8	6	+2	4	+10	2	+16	1
14	MMPALT	3	2.5	3	2.5	5	2	1	8	5	2	5	2	0	7
	PMPS	+5	4	+13	2	+14	1	+12	3	-13	6	-10	5	-18	7

** El Reno Site

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instru- ment	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	MMPALT	5	4.5	7	3	8	2	10	1	4	6	5	4.5	1	7
	PMPS	0	4	+12	2	+21	1	-10	5.5	-17	7	+8	3	-10	5.5
2	MMPALT	6	2.5	3	6.5	6	2.5	10	1	5	4	4	5	3	6.5
	PMPS	1	5	+11	3	+13	2	+15	1	-20	6	+2	4	-24	7
3	MMPALT	10	1.5	7	3	10	1.5	6	4	2	6	3	5	0	7
	PMPS	+15	2	+7	3	+16	1	-3	4.5	-3	4.5	-14	6	-28	7
4	MMPALT	4	5	5	3	5	3	8	1	5	3	1	6.5	1	6.5
	PMPS	+12	3	+11	4	+20	2	-14	6	+8	5	-23	1	-24	7
5	MMPALT	3	4	2	5	5	2	6	1	1	6.5	4	3	1	6.5
	PMPS	+14	2	+28	1	+6	3	-6	5	-10	6	-3	4	-28	7
6	MMPALT	-1	6	4	2	3	3	6	1	2	4	1	6	1	6
	PMPS	-8	6	-5	5	+9	3	+1	4	+16	1	+15	2	-35	7
7	MMPALT	9	1	5	3	1	6.5	6	2	1	6.5	4	4	3	5
	PMPS	+7	3	-3	6.5	+6	4	-3	6.5	+10	2	+14	1	+1	5
8	MMPALT	8	2	7	3	2	5.5	10	1	2	5.5	3	4	1	7
	PMPS	-8	5	-2	4	+12	2	-12	6	+4	3	+14	1	-15	7

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
9	MMPALT	5	4	5	4	3	6	6	1.5	5	4	6	1.5	0	7
	PMPS	+18	3	+19	2	+27	1	-8	5	-13	6	-6	4	-36	7
10	MMPALT	4	4.5	6	2	5	3	10	1	1	6.5	4	4.5	1	6.5
	PMPS	+19	1	+6	3	+18	2	-6	5	-3	4	-16	7	-15	6
11	MMPALT	6	4	9	1.5	7	3	9	1.5	4	5	3	6	1	7
	PMPS	+21	1	-9	6	+1	3.5	+11	2	-2	5	+1	3.5	-32	7
12	MMPALT	9	2	6	5	6	5	10	1	8	3	6	5	1	7
	PMPS	-22	7	-8	5	+5	4	-10	6	+11	3	+30	1	+13	2
13	MMPALT	10	1.5	9	3	7	4	10	1.5	6	5	4	6	0	7
	PMPS	-7	6	-4	5	+17	1.5	7	3	0	4	+17	1.5	-34	7
14	MMPALT	6	5	7	4	8	2.5	9	1	8	2.5	3	6	1	7
	PMPS	+29	1	+4	4	+12	2	+10	3	-6	6	-4	.5	-33	7

** End Site

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	MMPALT	7	4.5	8	3	9	2	10	1	7	4.5	7	4.5	1	7
	PMPS	+7	3	+15	2	+23	1	+1	4.5	-10	6	+1	4.5	-36	7
2	MMPALT	9	4	10	2	10	2	10	2	5	5	6	6	1	7
	PMPS	+4	3.5	-3	5	+17	1	-6	6	+4	3.5	+14	2	-24	7
3	MMPALT	9	2.5	9	2.5	9	2.5	9	2.5	8	5	6	6	2	7
	PMPS	+19	2	+15	3	+25	1	+4	4	-12	6	-9	5	-33	7
4	MMPALT	10	2	7	4.5	10	2	10	2	7	4.5	4	6	1	7
	PMPS														
5	MMPALT	2	6	5	3	5	3	4	5	5	3	6	1	0	7
	PMPS	+19	2	+21	1	+9	3	-5	5	-11	6	-1	4	-35	7

* Norman Site

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	MMPALT	6	6.5	9	2.5	8	4	10	1	9	2.5	6	6.5	1	7
	PMPS	+12	1	+9	2	+6	3	-5	6	-4	5	+1	4	-32	7
2	MMPALT	4	3	3	5	6	1	5	2	3	5	3	5	0	7
	PMPS	+12	1	+1	4	-1	5	+7	2.5	-12	6	+7	2.5	-26	7
3	MMPALT	3	2	2	4.5	2	4.5	1	7	4	1	2	4.5	2	4.5
	PMPS	-2	5	+7	4	+9	2	+8	3	-13	6	+21	1	-27	7
4	MMPALT	7	4	9	1.5	9	1.5	8	3	1	7	2	6	3	5
	PMPS	0	4.5	-6	6	0	4.5	+2	3	+8	2	+18	1	-19	7

* El Reno Cluster Site
(S.W. Cluster of [OAYS])

SUMMARY OF INDIVIDUAL SCORES AND RANKS FOR MMPALT II AND THE PMPS SURVEY

Subject Number	Instrument	SCORES, RANKS BY ELEMENT													
		Print		Aural		Interactive		Visual		Haptic		Kinesthetic		Olfactory	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	MMPALT	1	6.5	4	3	3	4.5	5	2	6	1	1	6.5	3	4.5
	PMPS	-2	4	+14	2	+19	1	+1	3	-10	6	-8	5	-17	7
2	MMPALT	1	6	1	6	3	2.5	2	4	4	1	3	2.5	1	6
	PMPS	+6	4	+23	1	+18	2	-15	6	-10	5	+13	3	-28	7
3	MMPALT	1	7	4	3.5	5	2	4	3.5	6	1	3	5	2	6
	PMPS	-19	6	+5	3	+2	4	0	5	+19	2	+32	1	-35	7

** Shawnee Site

VITA 2

Linda Sue Rice

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF LEARNING MODALITY ELEMENT OF THE OKLAHOMA ASSOCIATION OF YOUTH SERVICES MEMBERS

Major Field: Occupational and Adult Education

Biographical Data:

Personal Data: Born in Baxter Springs, Kansas, August 2, 1949, the daughter of Mr. and Mrs. Robert Roy Moates, Sr. Married to Dennis L. Rice June 1, 1968. Divorced July 2, 1982. They have one son, D. L. Rice II.

Education: Attended Oklahoma State 1969, received Associates of Arts Degree in Social Services from Sacramento City College in 1974; completed Bachelor of Science in Criminal Justice from American Technological University in 1976; completed a Masters of Criminal Justice majoring in Rehabilitation and Social Services in 1977; completed requirements for the Doctor of Education at Oklahoma State University in May, 1984.

Professional Experiences: Juvenile Counselor, Youth Services Bureau of Central Texas-Temple, 1975-76. Senior Counselor Supervisor Y.S.B.C.T.-Temple 1976-77, Director of Social Services, Cottonwood Manor, Yukon, OK, 1978-79; Project Director-Criminal Justice, Neighborhood Services Organization, Oklahoma City, 1979-80; Executive Director, Youth and Family Services of Canadian County - El Reno, OK 1980 to Present.

Professional Organizations: Alternative Education Committee, Criminal Justice Advisory Committee; Oklahoma Alliance for Children; Oklahoma Association of Youth Services Board of Directors (OAYS); Phi Delta Kappa; Southwest Network of Youth Services Board of Directors, Yukon Chemical People Taskforce.