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· A STUDY OF LEARNING PREFERENCES AMONG EDUCABLE MENTALLY IMPAIRED, EMOTIONALLY IMPAIRED, LEARNING DISABLED, AND GENERAL EDUCATION STUDENTS IN SEVENTH, EIGHTH, AND NINTH GRADES AS MEASURED BY RESPONSES TO THE LEARNING STYLE INVENTORY. presented by

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## A STUDY OF LEARNING PREFERENCES AMONG EDUCABLE MENTALLY IMPAIRED, EMOTIONALLY IMPAIRED, LEARNING DISABLED, AND GENERAL EDUCATION STUDENTS IN SEVENTH, EIGHTH, AND NINTH GRADES AS MEASURED BY RESPONSES TO THE LEARNING STYLE INVENTORY

By

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Katherine Palmer Snider

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Department of Teacher Education

## A STUDY OF LEARNING PREFERENCES AMONG EDUCABLE MENTALLY IMPAIRED, EMOTIONALLY IMPAIRED, LEARNING DISABLED, AND GENERAL EDUCATION STUDENTS IN SEVENTH, EIGHTH, AND NINTH GRADES AS MEASURED BY RESPONSES TO THE LEARNING STYLE INVENTORY

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# ABSTRACT

Each category of special education impairment has been described by characteristics commonly found within that group. The purpose of this study was to investigate whether different categories of special education students held preferences for learning conditions in common that differed from one category to another and/or from non-handicapped students.

A review of the literature found overlap in group characteristics, established that students taught under their preferred learning conditions showed improved academic achievement, and analyzed differences of two special education groups on the Learning Style Inventory (LSI).

Four groups of students, educable mentally impaired (EMI), emotionally impaired (EI), learning disabled (LD), and general education, in grades seven to nine were given the LSI. One-factor analyses of variance on each of the 22 variables, with an alpha level of .05, were used to test six hypotheses that no differences in preferred learning conditions would be found between any of the groups. Interviews with selected special education teachers contributed information relative to student characteristics.

Five of the hypotheses were rejected, as differences were found on up to six of the variables. No differences were found between EMI and LD students. The nature of the learning conditions on which groups held different preferences appeared to have greater practical significance than the number of differences in planning an educational program.

The EMI and EI students held some significant group preferences. There were some implications here for evaluation and placement decisions. Differences in motivation and adult orientation suggested difficulty in structuring a learning environment to meet the needs of these two groups in a combined setting.

There was greater intra-group variability than inter-group variability on several preferences. Data from the teacher interviews substantiated the overlap of characteristics among the groups. Thus, learning preferences should be determined on an individual basis and not by disability category.

The absence of strong, identifiable group characteristics suggested that alternate methods of instructional grouping, such as learning preferences, need to be explored. Further research was recommended relative to instructional grouping of special education students that goes beyond label or category.

# TABLE OF CONTENTS

List of Tables	iv
CHAPTER I: THE PROBLEM	t
Background	1
Historic Review of Special Education	l
Special Education Classification	2
Trends	4
Need	6
Purpose	7
Research Questions	8
Methodology	8
Theoretical Background and Potential Significance of the Study	9
Assumptions and Limitations	10
Overview	11
CHAPTER II: REVIEW OF LITERATURE	
Introduction	13
Special Education Characteristics	13
Benefits of Matching Learning Environments to Students' Preferred Learning Conditions	20
Learning Preferences of Special Education Students	21
Summary	23

CHAPTER III: RESEARCH DESIGN		
Sample	26	
Measures	27	
Design	32	
Type of Research	32	
Testable Hypotheses	32	
Model for Analyses	33	
Summary	34	
CHAPTER IV: ANALYSES OF RESULTS	35	
Results	35	
Group Preferences	48	
Teacher Interviews	50	
Educable Mentally Impaired	50	
Emotionally Impaired	52	
Learning Disabled	53	
Summary	54	
CHAPTER V: SUMMARY AND CONCLUSIONS	57	
Summary	57	
Conclusions	58	
Implications	63	
Reflections	67	
Recommendations	70	

Appendix A	72
Appendix B	73
Appendix C	74
Appendix D	76
Appendix E	78
Bibliography	84

# LIST OF TABLES

1.	Data for Groups on LSI Variable I: Sound	38
2.	Data for Groups on LSI Variable 2: Light	38
3.	Data for Groups on LSI Variable 3: Temperature	39
4.	Data for Groups on LSI Variable 4: Formal Design	39
5.	Data for Groups on LSI Variable 5: Unmotivated/Motivated	40
6.	Data for Groups on LSI Variable 6: Persistent	40
7.	Data for Groups on LSI Variable 7: Responsible	41
8.	Data for Groups on LSI Variable 8: Structure	41
9.	Data for Groups on LSI Variable 9: Learning Alone or Peer Oriented	42
10.	Data for Groups on LSI Variable 10: Adult or Authority Oriented Learner	42
11.	Data for Groups on LSI Variable II: Several Ways	43
12.	Data for Groups on LSI Variable 12: Auditory	43
13.	Data for Groups on LSI Variable 13: Visual	44
14.	Data for Groups on LSI Variable 14: Tactile	44
15.	Data for Groups on LSI Variable 15: Kinesthetic	45
16.	Data for Groups on LSI Variable 16: Food Intake	45
17.	Data for Groups on LSI Variable 17: Evening/Morning	46
18.	Data for Groups on LSI Variable 18: Late Morning	46
19.	Data for Groups on LSI Variable 19: Afternoon	47
20.	Data for Groups on LSI Variable 20: Mobility	47

21.	Data for Groups on LSI Variable 21: Parent Motivated	48
22.	Data for Groups on LSI Variable 22: Teacher Motivated	48
23.	Mean Standard Scores on LSI Variables	49

# CHAPTER I

## THE PROBLEM

## Background

# **Historic Review of Special Education**

Public education programs for exceptional children in the United States began in the early 1800s, primarily in residential settings. By the middle of the nineteenth century, day school classes were being established. Over the next century the greatest program growth took place in the area of retardation.

A marked expansion of educational programs of exceptional children began in the 1940s. Federal legislation in the 1950s established grants for research and the training of personnel. In the decade between 1948 and 1958, special education enrollment in public day schools rose 132% (Mackie, 1961).

Programs for the handicapped were scattered through various departments of health, mental health, welfare, education, and state residential institutions. Research efforts came initially through the National Institute of Health. Educational issues received a low priority until researchers began to emerge from among the professions in education. The passage of Public Law (P.L.) 88-164 in 1963 marked the beginning of extensive federal involvement by making grants available at all levels of training for those who are employed in special education.

In the early 1970s, the prevalence figure for handicapped among school aged children was 10.035% (Dunn, 1973). An estimate of 12% was used in developing the Education for All Handicapped Children Act of 1975 (P.L. 94–142).

This act mandated services and procedures for special education. Special education became part of the education establishment, subject to stringent regulation and implementation rules involving the eligibility, classification, and placement of handicapped children.

#### Special Education Classification

The child in special education is labeled and, in many instances, segregated. The labels themselves carry certain expectations and limitations. A stigma may accompany the separation from normal school experiences. In addition, available resources can be restricted, as where an agency may serve only those with the prescribed label.

The special education categories and the bases for certification are briefly defined here. The full text of the relevant Michigan rules are appended (Act 451, 1983).

Educable mentally impaired (EMI) students show intellectual development approximately two to three standard deviations below the mean, scores in the lowest six percentiles in reading and arithmetic, lack of development primarily in the cognitive domain, and impaired adaptive behavior.

Emotionally impaired (EI) students show one or more of the following: inability to build or maintain satisfactory interpersonal relationships within the school environment, inappropriate types of behavior or feelings under normal circumstances, general pervasive mood of unhappiness or depression, tendency to develop physical symptoms or fears associated with personal or school problems.

Learning disabled (LD) students have a disorder in one or more of the basic psychological processes that is shown by a severe

discrepancy between achievement and intellectual ability in one or more of the following areas: oral expression, listening comprehension, written expression, basic reading skill, reading comprehension, mathematics calculation, mathematics reasoning.

After a child is found eligible for certification as handicapped under one of the category rules, placement in a special education class or program can be recommended. This placement secures relief for the child from the pressures seen as implicit in the regular education setting. Little attention may be given to determining how the learning setting itself has contributed to the child's difficulties.

Each category of impairment is described by the characteristics commonly found within that group. In turn, children who have those characteristics tend to be identified as belonging to that group. Controversy has arisen over the appropriateness of describing individuals by the characteristics associated with a group.

Some of the commonly found characteristics are described in Chapter II. It will also be seen that many of those characteristics are used in describing more than one group.

Assessment of learning preferences is not currently an integral part of the multidisciplinary evaluation process, but some group preferences are becoming known through research studies.

Most special education materials are not specifically directed to a particular category and so may be used with a variety of impairments. General education materials can also be adapted to fit the needs of the individual child. Instruction is individualized and mastery is the goal.

Special education groups overlap in terms of disability as well as characteristics. It was estimated in 1973 that about one-half of all exceptional

learners have one educationally significant disability, one-quarter have two, and one-quarter have three or more (Dunn, 1973).

Children with milder impairments seem to have so many educational needs in common that it is difficult to argue for separate classes. Psychological, educational, and behavioral characteristics do not clearly distinguish among individuals in the different categories. The methods of instruction with handicapped children are very similar to those used by good teachers with nonhandicapped children.

## Trends

The public treatment of handicapped children has come from a state of individual isolation, through segregated groupings with varying degrees of isolation, to integration into the mainstream of education with the provision of supplementary aids and materials. An individualized education program (IEP) (Act 451, 1983) for each handicapped child emphasizes needed services rather than the disability.

One outgrowth of the controversy over labeling and classification is the resource room concept. Here all categories of children with mild impairments are seen tutorially for a portion of their time in school, the remainder of their time being spent in general education programs. The teaching strategies and materials are aimed at the individual's needs and are not differentiated on the basis of impairment. Resource rooms also serve as a transition for children between self-contained special education classrooms and general education placement.

The mainstreaming movement is another reaction to the segregation and isolation which often occur in special education. This integration requires describing the handicapped individual's needs in educational terms. Attention is

given to skills already mastered and goals to be achieved rather than to a description of defects or a global description of characteristics associated with a particular label.

Concurrent with the changes taking place in public school programs, there is a trend to revise teacher education and certification along noncategorical lines. The principles of learning and behavior management are receiving greater emphasis. Thus teachers will be trained on a competency-based model rather than as teachers specifically of the EMI, EI, or LD.

Social stigma and segregation are negative consequences associated with labeling and grouping. One benefit, however, is that as children with handicaps are more accurately evaluated and sometimes stretched or squeezed to fit existing categories, new programs are developed to accommodate the distinguishable characteristics. Appropriate programs may be developed because the labeling issue has drawn attention to the need. One example is the classification of learning disability which evolved as a result of a 1963 compromise to the array of labels used to describe the child with a particular type of learning problem (Hallahan & Kauffman, 1978). Programs for the disadvantaged and bilingual were developed because those children did not fit special education classifications.

The states of Minnesota, Massachusetts, and Tennessee moved away from traditional labeling practices in the early 1970s (<u>Legal Issues</u>, 1977). In 1974 California re-classified the mildly retarded, emotionally disturbed, and learning disabled as "learning handicapped" (Hewett, 1977).

Pennsylvania began comprehensive teacher certification in 1977 which permits a teacher to instruct mentally retarded, brain injured, emotionally disturbed, physically handicapped, and learning disabled. By 1979 II states had

comprehensive certification and 12 more were planning to move in that direction (Belch, 1979).

#### Need

The distinctions between special education categories have become blurred. At the same time there is greater emphasis on integrating the handicapped with the nonhandicapped. If the needs of the child are to be adequately met, then each child must be evaluated not only according to the criteria as set forth in the law, but also according to a profile of individual assets and liabilities.

For example, Hewett (1964) suggests a hierarchy of learning competencies to describe the increasing levels of interaction and functioning of the child with the learning environment. The focus would be on the competencies needed for learning and the child's strengths or weaknesses relative to those competencies.

Adelman (1971) advocates matching the child's characteristics with those of the classroom program. He believes that discrepancies between the child and classroom program lead to poor performance.

Textbooks in special education speak of the need to "... observe the methods through which the child learns best ... " (Wallace & Kauffman, 1978) and "... for environments that provide greater individualized approaches" (Cullinan & Epstein, 1979).

The child should not be viewed in isolation but as functioning within a given setting and under certain conditions. In addition to curricular questions about what the child needs to learn and his/her readiness to learn with success arise questions about learning conditions.

Suggestions for appropriate learning conditions have been present but not often addressed outside of institutions or with some of the more severe handicaps. From early studies of some brain injured children came the advice to remove or reduce visually and auditorily distracting stimuli. Such a suggestion, however, may be applicable to any highly distractible child regardless of label or certification.

The general education teacher of a mainstreamed handicapped child is faced with developing a program for that child based on his/her IEP. Recognition is given to learning conditions when the instructional settings utilized in a specific classroom are considered in mainstreaming decisions.

#### Purpose

The purpose of this study is to investigate whether different categories of special education students hold preferences for learning conditions in common that differ from one category to another and/or from non-handicapped students.

Some of the conditions making up the learning environment are sound, light, temperature, design, intake, time of day, structure, and grouping. The learner may show various levels of motivation, persistence, and responsibility.

If teachers can tailor the classroom environment to the learning conditions preferred by the students, some of the tensions and frustrations leading to behavior problems may be reduced. Teacher time can then be more productively spent on instruction.

While there have been many studies related to the broad topic of cognitive or learning style, very few have dealt with the preferences for learning conditions of special education students. No studies were found, or referred to, that compared the learning preferences of the four groups (EI, LD, EMI, and general education students).

## **Research Questions**

Do educable mentally impaired students hold learning preferences in common that differ from the preferences held by emotionally impaired, learning disabled, or general education students?

Do emotionally impaired students hold learning preferences in common that differ from the preferences held by educable mentally impaired, learning disabled, or general education students?

Do learning disabled students hold learning preferences in common that differ from the preferences held by educable mentally impaired, emotionally impaired, or general education students?

## Methodology

The instrument selected to assess student learning preferences was the Learning Style Inventory (LSI) (Dunn, Dunn, & Price, 1978). The LSI looks at how individuals concentrate on, absorb, and retain new or different information or skills. A combination of environmental, emotional, sociological, and physical elements are evaluated. These 22 elements encompass conditions preferred for learning.

Subjects were students in seventh, eighth, and ninth grade classes in one small city public school. Participation was voluntary and with written parental permission. Limitations based on certification, program placement, amount and duration of time in the program assured representation of the three special education categories.

The LSI was administered by the classroom teachers in the classes involved. Scores on each of the 22 elements of the LSI were compared among each of the four groups, EMI, EI, LD, and general education, by analyses of variance. Further information relevant to group characteristics, instructional methods, and use of the LSI were solicited from selected special education teachers.

## Theoretical Background and Potential Significance of This Study

Data gathered over the years have shown that groups of EMI, EI, and LD students possess certain characteristics. These characteristics have been used to define and to differentiate the groups. Even though one or several characteristics may be shown to apply with statistical significance to a particular group of handicapped children, those features may not be sufficient for identifying an individual as belonging to that group. The search continues for characteristics that will more accurately discriminate between handicapped and non-handicapped students.

While the labels and categories may appear to be discrete and the assessment by a multidisciplinary team to be straight-forward and objective, in actual practice the divisions are not so clear. For example, a child may function two standard deviations below the mean on an individual test of intelligence (EMI), possess so few basic reading skills as to be significantly below his/her learning expectancy level (LD), and display serious acting-out behaviors (EI). The child is handicapped but the label applied can well set the parameters of the child's education program in spite of the mandated individualized education plan.

If differences in preferences for learning conditions between groups of children in EMI, EI, LD, and general education are found, then categorical special education delivery services may be supported. Both categorical and noncategorical services have been recommended based on studies which have involved only pairs of groups. A primary goal of appropriate instructional grouping is improved academic achievement. Dunn and Dunn (1978) believe that environmental factors in the classroom are relevant to student achievement. The literature contains many studies that indicate the efficacy on achievement of matching a student's preferred learning conditions with actual learning and testing conditions.

The learning environment of the classroom is more subject to teacher control than is the psychological make-up of the child. The arrangement of the room can provide varying degrees of sound, light, and formality. The teacher can establish the opportunities for the student to work alone, with peers, with adults, and to move about within the classroom. The teacher also organizes the instruction so that a student may work at his/her peak time and with the preferred or needed degree of structure. The use of specific teaching techniques can then be directed to the more emotional factors of motivation, persistence, and responsibility.

If a study of preferred learning conditions among the handicapped finds significant group preferences, then there are implications for instructional grouping and for the structuring of the learning environment. If few group preferences are identified, then consideration must be given to viewing these preferences as a matter of individual choice. Implications for instruction are again evident but derived from the individual rather than from the group as a whole.

## Assumptions and Limitations

Two sets of assumptions formed the framework for this study. The first set dealt with special education itself. Handicapped children in the public schools can learn. They may need supplementary aids, time, or materials because of their handicap. No one instructional technique will meet all needs,

even within a specific category of handicap. Discrimination in the form of categories or labels that does not lead to appropriate instructional help is undesirable.

The second group concerned education in general. The major function within schools is learning. The more that is known about an individual's functioning, the better educators will be able to develop a learning program for that individual. Curriculum legitimately involves questions of learning conditions in addition to knowledge of educational materials and teaching techniques. Teachers tend to utilize those ideas and theories that they perceive to be within their time, capability, and limits of power, and believe will yield positive results.

Learning conditions in this study were limited to the elements contained in the Learning Style Inventory. No assumptions were made as to how the subjects might respond to assessment of other dimensions of learning style.

Special education groups studied included only educable mentally impaired, emotionally impaired, and learning disabled. No other handicapped groups were included. Age level was restricted to students enrolled in grades seven, eight, and nine. Younger ages were not included in this population sample because of possible limitations in understanding items by some of the mentally impaired children. This restriction also prevented the giver of the scales from indirectly influencing the results with his/her explanations and interpretations.

#### Overview

Studies indicate that children who are taught under their preferred conditions perform better than children taught in non-preferred conditions. The measured gains are statistically significant. Some of these studies will be reviewed in Chapter II. In addition, literature regarding characteristics of children in special education categories will be reviewed. Specific studies of special education students and preferred learning conditions will be examined.

In Chapter III, the research population and means of selection will be described. The hypotheses will be stated in testable form and the model for analyses of the data will be presented.

The data will be analyzed and the results interpreted in Chapter IV. Chapter V will present a summary of the findings and conclusions.

# CHAPTER II

## **REVIEW OF LITERATURE**

## Introduction

The focus of this study is on the learning preferences of certain special education students. One aspect involves the characteristics of educable mentally impaired (EMI), emotionally impaired (EI), and learning disabled (LD) groups. A second aspect is the assertion that students learn more effectively in an environment that matches the individual's learning preferences. The literature to be discussed in this chapter will include studies relative to these topics. Research studies using the Learning Style Inventory (LSI) (Dunn, Dunn, & Price, 1978) in determining preferences for learning conditions by special education students will be examined.

# **Special Education Characteristics**

In order to compare the special education groups on preferences for learning conditions, it is helpful to understand some of the general characteristics associated with each group. It is also useful to note how distinguishing characteristics may be measured.

Hallahan and Kauffman (1978), in an introductory text for special education describe several handicaps, including EMI, EI, and LD. They include definitions, prevalence figures, causes, measurement or identification techniques, psychological and behavioral characteristics, educational considerations, and suggestions for managing the child in school. References are to their own research as well as that of other recognized experts in the field. Their

descriptions are congruent with other texts in special education. Although a secondary source, it provides an appropriate descriptive background upon which to evaluate research about the handicapped.

The educable mentally impaired have a reduced ability to learn. They are easily distracted and have a short attention span. Problems are noted in short term, but not long term, memory. They conclude that, "Retardates tend to go through the same stages of learning as do normals, but at a slower rate" (Hallahan & Kauffman, 1978, p. 87). This theoretical view is one of developmental delay rather than deficit. Speech and language difficulties are found more frequently than in the general population. Academically, the EMI students are underachievers, not only compared to age mates, but also relative to expectations based upon ability. They tend to be outer-directed with motivational problems and poor self concepts.

Suggestions to the teacher include sequenced learning tasks, drill and repetition, verbal mediation techniques, consistent reinforcement, increased motivation, continuous assessment, and immediate feedback.

Emotionally impaired children, as a group, are functioning in the dull normal range of intelligence. They are underachievers relative to both their peer group and expectations based on measured ability. Social skills are impaired. Disturbed behavior may be of an aggressive and acting-out nature or immature and withdrawn. It is noted under both types that the interaction between the child's behavior and the behavior of others in his/her environment is critical.

In the school setting there must be realistic expectations for a reasonable standard of conduct, and these must be clearly communicated to the child. Good behavior management also dictates that there will be appropriate and consistent consequences for behavior. The teacher should have an understanding of negative factors in the child's environment and be able to empathize with the child.

Learning disabled children demonstrate an uneven pattern of development with definite strengths and weaknesses. Achievement is below that of their peers and below expectancy based on ability. There are several characteristics that are found more often among learning disabled children than among nonhandicapped children, but are not present in all cases. These include perceptual problems in visual, auditory, and motor functions. Inattention and distractibility are often cited but some may be explained by a child's slowness to respond to stimuli and, at the other extreme, by hyperactivity. Receptive and expressive language problems interfere with learning and are two sub-types of learning disability. In general, deficits are demonstrated in memory, concept development, and problem solving. Impulsive and non-reflective strategies for solving problems, emotional lability, and low self esteem are characteristics likely to describe the LD group.

At school, work must be commensurate with current abilities or level of functioning. For the highly distractible or hyperactive student, special arrangements in the design of the classroom to reduce extraneous stimuli may be needed. Instructions must be monitored to be sure they are understood. The teacher should also be aware that signs of emotional disturbance may often be seen.

Problems in attention span, academic skills, behavioral responses, hyperactivity, emotionality, and self concept are more frequent among special education students than among general education students. Recommended materials are of high interest, low reading level, illustrative, and often manipulable. It is also noted that differentiation between groups focuses primarily on three general characteristics: IQ, personality and social adjustment, and underachievement. Hallahan and Kauffman (1978) state, "The research evidence that exists strongly suggests that children within the three categories are more alike than they are different with regard to these characteristics" (p. 46).

Blagg (1982) looked at adaptive behavior, social adjustment, and academic achievement of 120 children aged seven to nine in four groups: educable mentally retarded, learning disabled, behaviorally disordered, and regular. (These groups are named EMI, LD, EI, and general education in the current study.) Pairwise combinations of the four groups on each construct showed differences significant at the .001 level on each of the three constructs with respect to the four groups. He found, however, that none of the instruments used to measure these constructs were able to differentiate among all of the categories. The EMI and general education groups differed from the other two on achievement and the EI group differed in social adjustment.

Bernard (1978) attempted to develop a formula using factors of intelligence, discrepancy between expectancy and achievement, attention, plus others which would provide maximum discrimination between children classified as LD and those labeled EMI, EI, otherwise impaired, and non-impaired (general education). His study involved 1129 children, grades one through twelve, in 45 Michigan school districts. While his formula identified only 37.8% of the LD population, it also identified from five to fifteen percent from the other categories as being LD. The full scale IQ provided the most power to discriminate.

Krotec (1982) compared behavior, personality, and academic variables for 30 LD, El, and general education students in grades seven through twelve. She found no significant differences among the three groups on seven of eight personality factors. LD and El students were significantly lower than general education students on achievement. LD and El students did not differ significantly in classroom behavior, and only the El group differed significantly from the general education group on the behavior variable.

Differences found by Krotec (1982) were in comparison to the general education population and so are to be expected because of certification requirements. That is, lower achievement for the special education groups and poorer classroom behavior for the El students relative to the general population are expected.

Sapp, Chissom, and Horton (1984) studied the placement data for 90 EMI, LD, and EI students. Multiple comparisons indicated significant mean differences on the intelligence test and math achievement scores in favor of the LD and EI groups versus the EMI group. The LD and EI groups differed on some of the cognitive subscales but did not differ in achievement. No differences were found between the three groups on a teacher rating scale of behavior. These factors provided the highest correct classification for the EMI group (86.7% correct). However, intelligence test scores including subtest analyses were found to discriminate between the special education groups better than with the addition of other variables.

Gajar (1980) attempted to determine whether the characteristics attributable to children identified as EMI, EI, and LD distinguish among the groups. She selected seven cognitive, affective, and demographic characteristics for predictive value in discriminating among 198 already identified students in special education classes. Five of the seven characteristics contributed to the variance, significant at the .001 level, and correctly classified 81.8% of the total. EMI students were lower on cognitive measures, LDs had lower achievement than Els, and the El group had higher scores on measures of conduct disorders and

personality problems. Measures of socio-economic status and immaturityinadequacy did not show differences.

She concluded that many of these differences could be expected because of how the disabilities are defined as well as the original bases for placing these students in special education programs. Although these characteristics discriminated statistically between the groups, the differences were not educationally relevant as they did not talk about how the students learned best.

In similar research, Owen (1976) found that 3 of 23 variables could identify and separate 73% of the 100 LD and El children in his study. Two of these variables were subtests from a test of intelligence. Since multiple regression analysis accounted for only 25% of the variance, much remained unknown about the total difference between LD and El students.

Becker (1978) randomly selected 20 EM1, 20 LD (resource room type), and 20 severe, full time special class students with learning, behavior, or emotional problems, aged nine through thirteen, to study learning characteristics. He used a battery of five tests focusing on conceptual abilities and learning style. The largest differences were found between the LD and EMI groups. No significant differences were found in impulsivity-reflection. On the learning style factors, the EMI group was shown to be more outer-directed and field dependent.

Outer-directedness is an EMI characteristic cited by Hallahan and Kauffman (1978). Impulsive-reflective involves problem solving strategies and the fact that no significant differences were found between EMI, EI, or LD students seems especially pertinent if non-categorical grouping is being considered.

Clinical observations of LD children indicated they were distractible and inattentive in the classroom and performed less well than general education students on measures of attention. Miller (1983) studied 49 boys in grades three, five, and six. Comparisons of attending behavior in the classroom were made by observation under varying conditions of group size, teacher involvement, and subject matter topics. Comparisons were also made under controlled laboratory conditions.

She found LDs were on task to the same degree as general education students in academic and arts topics. LDs were more on task in the resource room than in the general education classroom. Attention was higher, .001 level, during teacher directed instruction than during independent seatwork for both groups. Results of the laboratory studies indicated no differences between the groups in speed or accuracy of responses under conditions of distraction or no distraction.

Her data failed to support the clinical observations of LD distractibility and suggested that academic differences between the two groups might not be attributable to attentional deficits in LD children.

Statistical differences can be found among the three special education groups on many factors. However, in attempting to find the means of discrimination, the researchers are discovering that the instruments used to measure the variables are inadequate. While they may predict classification after the fact, with some accuracy, a large percentage may be either unidentified or mis-categorized.

It is possible that the instruments are being used to measure differences that are not present on a consistent basis, or the differences are not great enough to be measured accurately. Perhaps there are differences that are not typical educational dimensions and thus educational measures are inappropriate.

Three of the studies (Sapp, Chissom, and Horton, 1984; Bernard, 1978; and Owen, 1976) found intelligence test scores to provide the most discrimination between groups. If one accepts the theory of developmental delay rather than

the idea of defect, then the IQ differences of the mildly retarded (EMI) may be insufficient reason for segregated instruction.

Failure to find differences between groups may help direct the attention of educators away from stereotypes associated with labels and categories.

## Benefits of Matching Learning Environments to Students' Preferred Learning Conditions

If students are to be grouped according to preferences for learning conditions, then the benefits must outweigh the perceived benefits of grouping by impairment category.

Krimsky (1982) used the LSI to determine fourth grade student preferences for light. He found that reading speed and accuracy were increased where students' preferences for either bright or dim light were matched with a complementary illuminated environment. In this study it was found that the amount of light was not a critical factor.

The accoustical preferences of sixth graders for noise or quiet, and their mean reading comprehension and attitude scores were studied by Pizzo (1981). Scores were significantly higher, .01 level, for those tested in an environment congruent with their preferences than for those tested in an incongruent environment. She also concluded that preferences were individual, not sex related, and that individuals required different noise levels to perform at their optimum levels.

Lynch (1981) found in his study of eleventh and twelfth grade students identified as truants that truancy was reduced when time preferences were considered in scheduling. He suggested that such idiosyncratic characteristics of students should be a focal point in individualizing educational programs. Carbo (1980) looked at modality preferences of kindergarteners and the word stimulus methods used in reading. On measures of immediate recall as well as delayed recall, she found significant interactive effects. Auditory preference learners tended to recall more words following the visual-auditory method than following either the visual or the visual-tactual methods. Visual preference learners tended to recall more words following the visual method than following either the visual-auditory or the visual-tactual methods.

Shea (1983) focused only on the design element in hypothesizing that students tested in environments congruent with their preferences would achieve significantly higher reading comprehension scores than peers tested in nonpreferred environments. His sample of 32 ninth graders drawn from a population of 410 included only those who showed very strong preferences (above 70 and below 30 t-scores on the LSI).

He found interaction significant beyond the .001 level between design preferences and actual environmental design. Mean scores on the Metropolitan Achievement Test, Reading Comprehension Subtest, were significantly higher for those tested in their preferred setting.

## Learning Preferences of Special Education Students

The studies using the Learning Style Inventory have looked mostly at general education students. Few have looked at the preferences of special education students on the LSI.

Price (1982) looked at the relationship between learning preferences for LD and non-LD students on the LSI. The LD sample of 41 males and females made up the total population of LD students in grades four, five, and six from a rural elementary school district. Forty-one non-LD students were randomly selected from the same schools. The SPSS discriminant analysis was used to identify six variables which significantly discriminated between the groups.

Compared to the non-LD students, the LD students preferred to learn more with peers, a warmer environment, less through kinesthetic means, less teacher motivated, less responsible, and less persistent.

Together these six variables classified 78% of the subjects correctly. However, as with the studies looking at group characteristics, there remains too large a percentage of students who are not correctly identified.

Wild (1979) studied 40 learning disabled and 40 non-learning disabled male students in grades seven and eight to determine whether there were differences in learning preferences on the LSI. All the students actively participating in the LD program were included. The non-LD group was chosen by simple random sampling. Results were analyzed by an SPSS step-wise discriminant technique. Differences significant at the .0001 to .05 levels were found on four variables: persistent, adult motivated, prefers learning with adults, and prefers learning in several sociological ways. The LD group was less persistent, less adult motivated, preferred to learn with adults, and preferred not to learn in several sociological ways.

Differences between LD and non-LD students were found in both studies. However, the reader is not assured of the representativeness of the LD sample outside of the respective school districts. It might also be asked whether any other handicapped students were included in the non-LD samples.

It is not apparent from the reports of the results whether either group holds a significantly strong preference outside the middle range of scores. Therefore, it is not known whether any of these variables were significant in the learning processes of either group. Dean (1982) looked at 429 students from grades four through twelve in four school districts. Her research questions asked whether learning styles of EMR (EMI) and LD students differ, if gender or race discriminate learning style, or if age is related to learning style. The LSI test form used involved 24 variables and a true-false answer format. She found statistically significant differences at the .05 level between EMI and LD students on nine variables, but on seven the scores fell within the intermediate range signifying it was not a strong positive or negative preference. Compared to the LD students, EMI students preferred brighter light, more formal design, to learn with peers, kinesthetic and visual experiences, morning, and to be teacher-motivated. LD students as a group preferred not to learn with adults and preferred not to learn in late morning. These scores were outside the intermediate range.

Some statistical differences in scores relative to gender, race, and age were found, but most fell within the middle range and so were not considered important factors in the individual's learning preferences.

Dean (1982) concluded that EMI and LD students did not differ greatly in their learning preferences as only two variables discriminated between ranges of importance to learning. These variables, learning with adults and late morning, were not considered crucial in planning a student's learning environment. She also stated that gender, race, and age were not important factors in determining the effective learning environment.

#### Summary

Descriptions of characteristics relative to IQ, personality and social adjustment, and underachievement were outlined by Hallahan and Kauffman (1978).

Differences in IQ were found, and EMI students ranked the lowest. The law regarding eligibility set IQ limits for this group which it did not set for EI and LD students. Even though students had other learning or behavior problems, the IQ level was predominant in categorizing a child as EMI rather than EI or LD. Sapp, Chissom, and Horton (1984) found LDs to have higher IQs than EI students, while Gajar (1980) found no significant differences between EI and LD students on cognitive measures.

The second characteristic of differentiation mentioned was personality and social adjustment. El students were found to have greater problems compared to LD and EMI students in the studies of Blagg (1982) and Gajar. Krotec (1982) found no differences in classroom behavior or on seven of eight personality factors.

On the third characteristic, achievement was lower for the EMI groups of Sapp, Chissom, and Horton (1984) and Blagg, and the achievement of LDs was lower than Els in the Gajar study. No differences in achievement between LD and El students were found by Sapp, Chissom, and Horton, Blagg, or Krotec.

Short attention span and distractibility were characteristics often associated with learning disabled children. Through controlled classroom observations and laboratory conditions, Miller (1983) found that LD students could attend and resist distractions as well as general education students.

There was overlap between the groups on many of the characteristics and measures of these characteristics discriminated among EMI, EI, LD, and general education groups with varying degrees of reliability.

Using the Learning Style Inventory, Krimsky (1982), Pizzo (1981), and Carbo (1980) found that students taught and tested under their preferred learning conditions showed improved academic achievement. The matching of condition and preference, not the condition in itself, was the critical factor. Lynch (1981) found the same benefits of matching preferences with conditions in reducing truancy.

On studies looking specifically at the preferences of special education students on the LSI, some differences were found. Price (1982) and Wild (1979) found differences on six and four variables, respectively, between LD and non-LD students. Both found LDs less persistent and less adult motivated. However, one showed that LD students preferred to learn with peers, while the other stated that LD students preferred to learn with adults.

Dean's (1982) comparison of LD and EMI students found statistical differences on nine variables. Only two indicated a strong group preference which she did not consider crucial to the learning environment. She concluded that the groups did not differ greatly.
### CHAPTER III

### **RESEARCH DESIGN**

### Sample

The subjects in this study were drawn from a midwestern city public school system with a student enrollment of approximately 9500. Some special education students from other schools in the county were enrolled in the city on a contract basis. While the county is rural with an agricultural base, the city is dominated by a major industry with above average educational and socio-economic levels.

The subjects were enrolled in the district's three intermediate schools in grades seven, eight, or nine and with an age range of 12 to 16.

Special education students were limited to those certified by the guidelines of P.L. 94-142 and P. A. 451 as educable mentally impaired, emotionally impaired, or learning disabled, and placed in a program for that impairment. For example, a student certified as trainable mentally impaired (TMI) could not be included even though the student might be placed in an educable mentally impaired (EMI) program. A student certified as EMI but placed in an emotionally impaired (EI) program could not be included.

A further restriction imposed on the group of learning disabled (LD) students was that each student included be assigned to the LD classroom for at least three of the six available class hours. This increased the delineation between handicapped and general education students. LD students have been so certified for at least two years. Only two students in the El category have been certified for fewer than two years.

26

The total number of special education students enrolled in LD, EMI, and EI programs in grades seven, eight, and nine when this study was initiated was 116. The restrictions given reduced the available number to 64.

The general education students were randomly selected as a class from among the sections of social studies classes required of all seventh, eighth, and ninth grade students. The group selected was a third hour, ninth grade social studies class in building Z. Any students shown to have been referred for evaluation by the school psychologist or to have been certified or placed in a special education program were not to be included. The available number of students in this group was 23. The general education group served a control function in looking at the special education groups and so the different means of group selection was not viewed as a limiting factor.

Written permission was required from the parent or guardian of each student participating in this study. The special education teachers and general education teacher of the students were informed of the project, invited to participate, and asked to administer the instrument.

#### Measures

The Learning Style Inventory, copyrighted in 1975, revised in 1978, by Rita Dunn, Kenneth Dunn, and Gary Price (1978) was selected as the measure of preferences for learning conditions. This instrument identifies 22 elements or conditions that affect the way people learn. The environmental elements are sound, light, temperature, and design. Emotional elements include motivation, persistence, responsibility, and structure. Sociological elements identify the group (self, peer, adult, or a variety) with whom the student believes s/he learns best. The physical elements are perceptual preferences (auditory, visual, tactile, kinesthetic), food intake, time of day, and mobility. The authors have found that most people have between six and fourteen elements that affect them strongly (Dunn, 1983).

The 22 elements of the LSI and descriptions of how high or low preferences can be accommodated in the classroom are listed below (Price, Dunn, & Dunn, 1982).

- 1. <u>Sound</u>: students with low scores (t-score of 40 or below) prefer silent areas to work and study; students with high scores (tscores of 60 or above) prefer some noise such as soft music or conversation in their work area.
- 2. <u>Light:</u> provide indirect or subdued light for low scores and placement near windows or table lamps for high preferences.
- 3. <u>Temperature</u>: low scores indicate a preference for cooler areas; high scores suggest warmer study climate, supplemental heating, or additional clothing.
- 4. <u>Formal design</u>: students with low scores prefer informal and casual furniture and arrangements. Students with high scores prefer a formal climate such as rows of desks or straight chairs and plain rooms.
- 5. <u>Unmotivated/motivated</u>: provide short-term and uncomplicated assignments with several options and frequent teacher discussions to students scoring low. For motivated students, suggest self-designed objectives and self-pacing.
- 6. <u>Persistent</u>: low scores suggest the need for short-term or limited assignments, use of reinforcers and praise. High scoring students can handle long-term assignments with less supervision and with help available if needed.
- 7. <u>Responsible:</u> give limited assignments with few options but frequent checking for those low in this area. For high scorers increase length and scope of assignments, challenging the student at or slightly beyond his/her level of functioning.
- 8. <u>Structure</u>: low scores indicate the need for well-defined objectives and regular review of work but with options for procedures, means, time, and environment. For students with high scores, specify all aspects of the assignment and permit no options; leave nothing for interpretation.
- 9. <u>Alone or peer oriented</u>: pair the low scoring student with peer or authority oriented students that complement the student's sociological characteristics. For high scoring students, use selfdesigned objectives, self-pacing, and encourage peer groupings.

- 10. <u>Adult or authority oriented</u>: identify the low scorer's characteristics and allow such groupings. Place the high scorer near teachers and meet with them often.
- 11. <u>Several ways</u>: permit students to work with preferred group or with options. High preferences need a variety of study groups (alone, peers, teachers).
- 12. <u>Auditory</u>: provide modalities preferred or multisensory approaches if the low scorer has no strong preferences. For strong auditory preferences, use items such as tapes or records and give precise oral directions.
- 13. <u>Visual</u>: provide modalities preferred or multisensory approaches if the low scorer has no strong preferences. For strong preferences, use resources that require reading or seeing by using pictures, films, diagrams, etc.
- 14. <u>Tactile</u>: provide modalities preferred or multisensory approaches if the low scorer has no strong preferences. For the high scoring student, use resources that are touchable, movable, and three dimensional. Use models, reports, and demonstrations.
- 15. <u>Kinesthetic</u>: provide any strong resources preferred or multisensory approaches if the low scorer has no strong preferences. Provide the high scoring student with visits, real experiences, and participation.
- 16. Intake: nothing special is needed for low preferences. Students with high scores can use frequent food breaks and snacks or drinks in the work area.
- 17. Evening/morning: low scorers prefer to schedule difficult work in the evening. High scorers prefer to study in the morning.
- 18. <u>Late morning</u>: permit low scorers to work in their preferred time. Students with high scores prefer to work in the late morning.
- 19. Afternoon: permit low scoring students to work in their preferred time. Students with high scores prefer to work in the afternoon.
- 20. <u>Mobility</u>: for students with low scores, provide a stationary work area and do not require moving about. Students with high scores need frequent breaks and the chance to move about and work in different places.
- 21. Parent motivated: the student with a low score should be allowed to work alone and with little parent involvement. Students with high scores may work near parents and involve parents in their studies.

22. <u>Teacher motivated</u>: the student with a low score should be allowed to work alone and with intrinsic motivation. The student with a high score may wish to work with or near the teacher.

According to the manual (Dunn, Dunn, & Price, 1981), 56% of the reliabilities equalled or exceeded .60 for the revision. On a four week test/retest of the LSI (1975), all reliabilities were statistically significant at the .01 level or better with the exception of the area of adult motivated.

An eight month test/retest on the 1978 version showed 80% of the variables were significant at a probability level of .05 or greater with 56% significant at the .01 level. The variables that were not significant at the .05 level were light, adult motivated, teacher motivated, late morning and evening. These were found to fluctuate at various grade levels, particularly the middle school years.

The newest revision attempted to clarify items that may have been confusing, open to different interpretations, and not clear in their assessment of the defined areas. The low reliabilities generally appeared due to a clustering of respondents on one end of a continuum, changes of responses across grades, and too few questions in an area.

Research on the LSI reported in the manual showed that several changes do take place across grade levels. Most differences reflected a preference slope that either increased or decreased the higher the grade level. For example, students preferred to learn less through the tactile and more through the auditory senses the higher the grade. Visual preferences were highest in grades four through six, variable in grades seven and eight, then decreased in high school. The higher the grade, the less adult oriented, teacher motivated, structure, and less motivated in general were found among the preferred variables. Also, the higher the grade, the more sound, light, formal design, and intake were preferred. Students were most persistent in grade six, least in grades nine, ten, and eleven. The present study minimized the effect of these changes by restricting the range of students to grades seven, eight, and nine.

Comparisons between males and females within grades also yielded some differences, but Price (Dunn, Dunn, & Price, 1981) warned that even when statistical significance is found, there may not be a meaningful or understandable difference. The present study involved 40 males and 18 females, with an equal distribution in the general education group. The ratio of females to males in each of the three special education groups was similar.

In the present study students were given the LSI in familiar surroundings by a teacher whom they knew and with whom they had studied. Each teacher was instructed to follow the test directions. Items were read aloud to those students who had difficulty decoding and comprehending written material. All students in the group who had parental permission were given the Inventory even though it was known some would not be in the final data analysis because of the restrictions set for inclusion.

Students responded to 104 statements by marking one of the following choices: strongly agree, agree, undecided, disagree, strongly disagree. Responses were machine scored by the test developer. A consistency scale was built into the instrument. Any students who received a score below 75 on this scale were excluded from data analysis. This reduced the number in the study to 58.

In order to better understand the preferences of the special education students, it was decided to interview three special education teachers, one of EMI students, one of EI students, and one of LD students. One set of questions was presented after the LSI had been given but before the results were returned. These questions dealt with the teachers' experience and philosophy, teaching methods, school setting and climate, expectations, and LSI administration.

31

The second set of questions was presented after the LSI profiles had been returned to the teachers and students. Questions were directed to surprises in preferences indicated, congruence with their perceptions of the groups, usability of the information, and effect upon instruction. They were asked to comment on some clusters suggested, but not statistically validated at that time, in the group profiles. Suggestion sheets provided with the individual profiles described ways to tailor the learning setting to either a high or low preference for each variable. The teachers used these in making some of their comments. The complete set of questions is found in Appendix E.

The time spent interviewing each teacher was approximately two and onehalf hours. They responded freely; sometimes the spontaneous comments and their elaboration on questions provided more descriptive materials than that given to the direct questions.

#### Design

#### Type of Research

The type of research conducted was expost facto.

### **Testable Hypotheses**

In testing hypotheses relative to differences in preferences for learning conditions between the groups, it was implicit that the findings were making statements about the preferences of the separate groups. Thus the purpose of the study, investigation of whether different categories of special education students hold learning preferences in common that differ from one group to another, was being fulfilled.

No differences will be found in learning preferences measured by the LSI between educable mentally and emotionally impaired students.  $H_0$ :  $M_1 - M_2$ 

No differences will be found in learning preferences measured by the LSI between educable mentally impaired and learning disabled students.  $H_0$ :  $M_1 = M_3$ 

No differences will be found in learning preferences measured by the LSI between educable mentally impaired and general education students.  $H_0$ :  $M_1 = M_4$ 

No differences will be found in learning preferences measured by the LSI between emotionally impaired and learning disabled students.  $H_0$ :  $M_2 = M_3$ 

No differences will be found in learning preferences measured by the LSI between emotionally impaired and general education students.  $H_0$ :  $M_2 = M_4$ 

No differences will be found in learning preferences measured by the LSI between learning disabled and general education students.  $H_0$ :  $M_3 = M_4$ 

Legend: M<sub>1</sub> = educable mentally impaired group mean

 $M_2$  = emotionally impaired group mean

M<sub>3</sub> = learning disabled group mean

M<sub>4</sub> = general education group mean

### Model for Analyses

Pairwise comparisons of the four groups on each of the 22 variables were done by one factor analyses of variance using the F ratio. The SPSS subprogram "Oneway" was used. Homogeneity of variance was routinely tested by the Bartlett-Box F and the Cochrans C techniques.

In testing the hypotheses, an alpha level of .05 was used. Scheffe's multiple contrast method was used. This method was chosen because it was more conservative than the other methods in rejecting the null hypotheses. In addition, it was exact, even for unequal group sizes.

### Summary

Four groups of students, EMI, EI, LD, and general education, in grades seven through nine were given the Learning Style Inventory. The LSI is a measure of 22 preferences for learning conditions. This ex post facto study tested hypotheses that no differences would be found between any of the groups.

One-factor analyses of variance with an alpha level of .05 were used. The Bartlett-Box F test of homogeneity of variance and the Scheffe multiple contrast method were used to analyze the data.

### CHAPTER IV

### ANALYSES OF RESULTS

### Results

Statistics for each group were calculated on each of the 22 variables of the Learning Style Inventory (LSI). Analysis of variance on each variable indicated by means of the F ratio the probability of a difference in any of the group means. An alpha level of .05 was used.

The assumption of homogeneity of variance was tested by the Bartlett-Box F technique. All probabilities exceeded the .05 level except one (see Table 21). The assumption of homogeneity was, therefore, accepted.

The Scheffe multiple range test elaborated on the ANOVA in showing where the differences were by indicating which of the groups differed significantly from one another.

Two of the four groups were found to have significant preferences for learning conditions. The teachers' interview responses provided additional descriptive data on the special education groups.

The number in the groups was constant across the variables: educable mentally impaired (EMI), N = 11; emotionally impaired (EI), N = 11; learning disabled (LD), N = 19; general education (GE), N = 17.

Hypothesis: No differences will be found in learning preferences measured by the LSI between educable mentally impaired and emotionally impaired students.

The data indicated differences between EMI and El groups in preferences on the following variables: unmotivated/motivated (eagerness to learn), structure (specific rules and limited options), adult or authority oriented (better able to concentrate and more comfortable in adult dominated learning situations), visual (differentiations and associations based on visual perception), late morning (time of achieving most effectively), and parent motivated (enthusiasm related to parent involvement).

Differences were significant at less than the .05 level. Probability levels ranged from .0000 to .0341 (see Tables 5, 8, 10, 13, 18, 21). The null hypothesis was rejected.

Other differences were suggested in preferences for auditory perception and for learning in the afternoon by F probabilities less than .05 but were not verified by the Scheffe multiple range test (see Tables 12 and 19).

On each of the eight variables, the EMI students held a greater\* preference than the EI students.

Hypothesis: No differences will be found in learning preferences measured by the LSI between educable mentally impaired and learning disabled students.

The data indicated no significant differences between the EMI and LD groups. Using the .05 error level, the null hypothesis failed to be rejected.

Differences were suggested in visual preferences by the F probability but were not verified by the Scheffe multiple range test (see Table 13). EMI students expressed a greater preference than LD students for the visual mode of perception.

Hypothesis: No differences will be found in learning preferences measured by the LSI between educable mentally impaired and general education students.

The data indicated differences between the EMI and general education groups on the following variables: persistent, responsible, structure, adult or

<sup>\*</sup>Greater is a relative term and indicates direction. The significantly strong group preferences are discussed in the section on "group preferences."

authority oriented, visual, and mobility. The general education students tended to be more persistent and responsible. EMI students showed stronger preferences for structure, adult directed learning situations, the visual mode in learning, and moving about while learning.

Differences were significant at less than the .05 level. Probability levels ranged from .0000 to .0046 (see Tables 6, 7, 8, 10, 13, 20). The null hypothesis was rejected.

Hypothesis: No differences will be found in learning preferences measured by the LSI between emotionally impaired and learning disabled students.

The data indicated a difference between the EI and LD groups on the unmotivated/motivated variable. LD students were more enthusiastic about learning than EI students. The difference was significant at the .0000 level (see Table 5). The null hypothesis was rejected.

Hypothesis: No differences will be found in learning preferences measured by the LSI between emotionally impaired and general education students.

The data indicated differences between the EI and general education groups on the variables of unmotivated/motivated, responsible, and mobility. General education students were more motivated and responsible. El students preferred to move about the learning setting more than general education students. Differences were significant at less than the .05 level. Probability levels ranged from .0000 to .0046 (see Tables 5, 7, 20). The null hypothesis was rejected.

Hypothesis: No differences will be found in learning preferences measured by the LSI between learning disabled and general education students.

The data indicated differences between the LD and general education students on the variables of temperature, responsible, and visual. General education students preferred warmer temperatures and were more responsible. LD students held a greater preference for visual perception.

Differences were significant at less than the .05 level. Probability levels ranged from .0000 to .0165 (see Tables 3, 7, 13). The null hypothesis was rejected.

Table I Data for Groups on LSI Variable I: Sound

Factors	EMI	<u>E1</u>	LD	GE
Mean	13.3636	15.0000	14.3684	15.1176
Standard deviation	2.3355	3.8987	3.5779	4.4000
Standard error	.7042	1.1755	.8208	1.0672
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	.573 .6355 .239 (EMI, LD,	EI, GE)		

Table 2 Data for Groups on LSI Variable 2: Light

Factors	EMI	<u>E1</u>	LD	<u>GE</u>
Mean	11.9091	12.2727	12.4211	13.4706
Standard deviation	2.8091	1.3484	2.6939	3.3188
Standard error	.8470	.4066	.6180	.8049
F ratio F probability between groups Bartlett-box F probability Scheffe homogeneous subsets	.888 .4534 .053 (EMI, EI,	LD, GE)		

Table 3 Data for

Data for Groups on LSI Variable 3: Temperature	•	

Factors	EMI	<u>EI</u>	LD	GE	
Mean	<b>18.0</b> 909	18.2727	16.1053	19.0000	
Standard deviation	2.8091	3.1013	2.8847	2.1213	
Standard error	.8470	.9351	.6618	.5145	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	3.730 .0165 .544 (LD, EMI, EI) (EMI, EI, GE)				

# Table 4 Data for Groups on LSI Variable 4: Formal Design

Factors	EMI	EI	LD	GE	
Mean	11.7273	11.3636	11.5789	11.2353	
Standard deviation	<b>2.</b> 8667	1.7477	2.7145	2.6816	
Standard error	.8644	.5270	.6227	.6504	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	.101 .9594 .445 (GE, EI, L	.D, EMI)			

Table 5			
Data for	Groups on LSI	Variable 5:	Unmotivated/Motivated

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Factors	EMI	<u>E1</u>	LD	GE	
Mean	32.2727	<b>24.4</b> 545	29.1579	31.0000	
Standard deviation	4.1010	3.5032	3.8768	3.7417	
Standard error	1.2365	1.0563	.8894	.9075	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	9.269 .0000 .967 (EI) (LD,	GE, EMI)			

# Table 6 Data for Groups on LSI Variable 6: Persistent

Factors	EMI	<u>EI</u>	LD	<u>GE</u>	
Mean	14.2727	15.8182	15.4211	17.4118	
Standard deviation	2.1490	2.5226	2.1426	1.6225	
Standard error	.6479	.7606	.4915	.3935	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	5.550 .0021 .475 (EMI, LD, EI) (LD, EI, GE)				

Table 7 Data for Groups on LSI Variable 7: Responsible

Factors	EMI	<u>EI</u>	LD	GE
Mean	11.4545	10.0000	12.2105	14.8824
Standard deviation	3.5032	2.4495	3.1016	1.7636
Standard error	1.0563	.7385	.7116	.4277
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	7.924 .0002 .080 (EI, EMI,	LD) (GE)		

# Table 8 Data for Groups on LSI Variable 8: Structure

Factors	EMI	EI	LD	GE	
Mean	15.1818	9.9091	12.6316	11.4118	
Standard deviation	3.8162	3.4772	3.4028	2.8517	
Standard error	1.1506	1.0484	.7807	.6916	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	5.043 .0037 .773 (EI, GE, LD) (LD, EMI)				

Table 9

Data for Groups on LSI Variable 9: Learning Alone or Peer Oriented

Factors	EMI	EI	LD	<u>GE</u>
Mean	20.3636	24.3636	21.0526	19.2941
Standard deviation	5.7319	5.2206	5.5023	<b>5.2</b> 887
Standard error	1.7282	1.5741	1.2623	1.2827
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	2.015 .1228 .990 (GE, EMI,	LD, EI)		

### Table 10 Data for Groups on LSI Variable 10: Adult or Authority Oriented Learner

Factors	EMI	EI	LD	GE	
Mean	14.5455	9.4545	12.3158	9.8235	
Standard deviation	3.5032	2.9108	3.6826	2.1862	
Standard error	1.0563	.8776	.8448	.5302	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	7.104 .0004 .206 . (E1, GE, LD) (LD, EMI)				

Table II Data for Groups on LSI Variable II: Several Ways

Factors	<u>EMI</u>	<u>EI</u>	LD	GE	
Mean	12.3636	11.6364	12.1579	12.2941	
Standard deviation	4.4107	2.9077	2.1151	2.8453	
Standard error	1.3299	.8767	.4852	.6901	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	.138 .9369 .063 (EI, LD, (	GE, EMI)			

# Table 12 Data for Groups on LSI Variable 12: Auditory

Factors	EMI	<u>EI</u>	LD	GE	
Mean	16.1818	13.1818	13.8947	13.8824	
Standard deviation	2.8220	1.8878	2.9230	1.9327	
Standard error	.8509	.5692	.6706	.4687	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	3.180 .0312 .236 (EI, GE, L	-D, EMI)			

Table 13 Data for Groups on LSI Variable 13: Visual

Factors	EMI	EI	LD	GE
Mean	12.9091	10.0000	11.2105	9.5294
Standard deviation	1.4460	1.7889	1.6859	1.5459
Standard error	.4360	.5394	.3868	.3749
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	10.956 .0000 .906 (GE, EI)	(EI, LD) (L	D, EMI)	

# Table 14 Data for Groups on LSI Variable 14: Tactile

Factors	EMI	EI	LD	GE
Mean	19.1818	18.0000	18.0000	15.0000
Standard deviation	5.5465	4.1713	3.5277	4.4721
Standard error	1.6723	1.2577	.8093	1.0847
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	2.518 .0677 .433 (GE, EI, L	.D, EMI)		

Table 15 Data for Groups on LSI Variable 15: Kinesthetic

Factors	EMI	EI	LD	GE	
Mean	26.9091	23.9091	24.8947	23.1765	
Standard deviation	4.4374	3.9612	3.6499	2.6513	
Standard error	1.3379	1.1943	.8373	.6430	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	2.549 .0653 .314 (GE, EI, L	.D, EMI)			

# Table 16 Data for Groups on LSI Variable 16: Food Intake

Factors	<u>EMI</u>	EI	LD	<u>GE</u>	
Mean	16.6364	17.0000	16.8421	17.2353	
Standard deviation	4.4558	4.3359	3.6250	3.0110	
Standard error	1.3435	1.3073	.8316	.7303	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	.064 .9788 .488 (EMI, LD	, EI, GE)			

Table	17				
Data f	or	Groups	on LSI	Variable 17:	Evening/Morning

Factors	EMI	EI	LD	GE	
Mean	15.6364	15.1818	15.3684	15.1765	
Standard deviation	3.9312	3.6829	3.9751	4.2166	
Standard error	1.1853	1.1104	.9119	1.0227	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	.036 .9909 .974 (GE, EI, L	.D, EMI)			

# Table 18 Data for Groups on LSI Variable 18: Late Morning

Factors	EMI	EI	LD	GE		
Mean	11.1818	8.8182	10.5263	10.4706		
Standard deviation	2.0889	1.9400	1.8669	1.8411		
Standard error	.6298	.5849	.4283	.4465		
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	3.102 .0341 .973 (E1, GE, LD) (GE, LD, EMI)					

Table 19 Data for Groups on LSI Variable 19: Afternoon

Factors	EMI	<u>EI</u>	LD	<u>GE</u>
Mean	18.0909	14.6364	17.2105	17.5882
Standard deviation	2.1659	3.2946	3.1724	<b>2.</b> 5263
Standard error	.6530	<b>.</b> 9934	<b>.72</b> 78	.6127
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	3.334 .0260 .472 (EI, LD, 0	GE, EMI)		

# Table 20 Data for Groups on LSI Variable 20: Mobility

Factors	EMI	EI	LD	<u>GE</u>		
Mean	15.9091	16.0909	13.8947	11.9412		
Standard deviation	2.2563	3.6457	3.1954	3.7328		
Standard error	.6803	1.0992	.7331	.9053		
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	4.865 .0046 .399 (GE, LD) (LD, EMI, EI)					

Factors	EMI	EI	LD	GE	
Mean	19.0000	16.0909	17.2105	18.3529	
Standard deviation	1.3416	2.7370	2.6369	1.6179	
Standard error	.4045	.8252	.6049	<b>.</b> 3924	
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	4.073 .0111 .041 (EI, LD, C				

Table 21 Data for Groups on LSI Variable 21: Parent Motivated

Table 22 Data for Groups on LSI Variable 22: Teacher Motivated

Factors	EMI	EI	LD	GE
Mean	21.0000	18.3636	19.5789	19.2353
Standard deviation	2.5690	2.1106	3.0969	1.7511
Standard error	.7746	.6364	.7105	.4247
F ratio F probability between groups Bartlett-Box F probability Scheffe homogeneous subsets	2.181 .1009 .139 (E1, GE, L	.D, EMI)		

# **Group Preferences**

Each variable was analyzed within this study on the basis of raw score. In the scoring provided by the test developer, each variable was reported in terms of a standard t-score (mean = 50, standard deviation = 10). Standard scores of 40 or less and 60 or more indicated strong preferences. Standard scores between 40 and 60 were seen as indicating no strong preferences and, therefore, not significant to the student's learning environment.

The mean standard scores for the four groups on each of the 22 variables are shown in Table 23.

# Table 23

Mean Standard Scores on LSI Variables

varia	ble	EMI	<u>EI</u>	LD	GE
۱.	Sound	48	53	51	53
2.	Light	49	49	50	52
3.	Temperature	54	55	50	57
4.	Formal design	52	51	52	51
5.	Unmotivated/motivated	53	35	46	50
6.	Persistent	40	47	46	55
7.	Responsible	45	41	47	55
8.	Structure	57	42	50	46
9.	Alone or peer oriented	51	57	52	48
10.	Adult or authority oriented	64	48	57	49
11.	Several ways	51	49	50	51
12.	Auditory preferences	57	46	49	49
13.	Visual preferences	62	48	54	46
14.	Tactile preferences	54	52	52	44
15.	Kinesthetic preferences	54	47	49	44
16.	Intake	49	50	50	50
17.	Evening/morning	49	48	49	48
18.	Late morning	51	42	49	48
19.	Afternoon	53	44	51	52
20.	Mobility	53	53	47	45
21.	Parent motivated	55	40	46	52
22.	Teacher motivated	54	43	48	47

The EMI students as a group showed a significantly strong preference in three areas. The group mean was equivalent to a standard score of 64 on the adult or authority oriented variable. They scored 62 on the visual perception preference. Their group score of 40 on the persistent variable also indicated a strong preference but in the direction of not wanting to be persistent. Some directional preferences for the EMI group were suggested in favor of structure, auditory perception, and parent motivation; and away from being responsible.

The El students as a group indicated significantly strong negative preferences on the unmotivated/motivated and parent motivated variables. The El group also tended to prefer less responsibility and structure, to learn at some time other than late morning or afternoon, and to be poorly motivated by teachers. They did tend to prefer to learn alone or with peers and to have a higher temperature.

The LD group did not show any significant preferences outside of the middle range. They tended to prefer an adult or authority oriented learning environment.

The general education group in this study did not hold significant preferences on any variable. They did tend to prefer higher temperature, to be more persistent, not to move about, and not to use the tactile or kinesthetic modes of perception.

### **Teacher Interviews**

#### Educable Mentally Impaired

Ms. A is certified to teach general education, emotionally impaired, and all levels of mentally impaired. Her training includes graduate coursework for a Master's degree. She has over 10 years of experience in special education.

She describes the EMI student in this grade range as socially and emotionally immature with a broad range of learning deficits. Behavior problems are prevalent. The teacher may spend 15 to 20 minutes of a 50 minute class period on discipline. The students seem secure in their own group, but insecure outside it. Friendships are within the group, while outside the group they generally do not go beyond acquaintances.

In terms of some of the LSI variables, she went on to describe low attention span and poor short term memory. Many are distractible. They are not irresponsible on purpose, but are immature and disorganized. She sees EMI students as needing somebody else to set the structure and limits. She feels they recognize that they need to learn things in different ways and that multisensory approaches are more motivating. From half an hour before lunch to the end of the day is down-hill. She believes school is a positive experience and a social structure with the teachers an important part of their lives.

Her teaching methods recognize their need to be physically involved in their work, so she uses as many activities as possible. Such involvement also helps with attention. She needs to go over and over things. She uses many different modalities and techniques to get a point across, always combining visual and auditory means. She says if they don't use it, they lose it; so she teaches things they will need to use. Learning behavior is reinforced with lots of praise, making a "big deal" of good grades in front of the rest of the class, notes and phone calls home, and displaying papers.

When asked what kind of changes she would make in classroom conditions if permitted, she spoke of a quiet area with something comfortable besides desks and conducive to socialization.

The administration of the LSI took about twice as long as suggested by the manual. The EMI students had some difficulty using the separate answer sheets and understanding the five gradations of response. This was a new experience, and they were quiet and attentive. Some were reflective, but some seemed to be more concerned with keeping up. Some words or statements needed further definition.

Ms. A believes the LSI results generally describe the EMI students as she has known them in her teaching experiences. She feels the responses are valid and reflect her perceptions of how they learn. She also added that the group included in the final data analysis is a more typical EMI group than is her class as a whole.

### **Emotionally Impaired**

Ms. B is certified to teach emotionally impaired students. Her training includes graduate coursework for a Master's degree. She has over 10 years experience with special education and general education students.

She describes three types of El students. One has a poor self image, is withdrawn, and has poor peer and social relationships. Another is hyperactive, easily frustrated, has a low locus of control and a short attention span. They need a lot of structure and expectations must begin small and go to larger increments. The third group is so severe as to apparently need residential placement. The El student is seen as generally more challenging and questioning. They don't take things as they are, seem more vocal, impulsive, cannot delay gratification, and behaviors are inappropriate. There is little interaction with general education students, and ones they do interact with are often poor role models.

Descriptions relative to some of the variables on the LSI mention that El students are unmotivated and low in persistence. They are not seen as really responsible. They do not like but do need a great deal of structure. El students do not want to work with the teacher and so are not adult oriented. They seem to be able to understand concepts without direct, hands-on (kinesthetic) experience. Time of day is important; students who present few problems in the first class hour may be very difficult to manage in the same classroom situation

later in the day. She permits mobility because of the difficulty they have sitting through a class period. She attempts to develop intrinsic motivation rather than through parents or teachers, although teachers may be better able than parents to motivate students of this age.

Ms. B's teaching methods involve high expectations, lots of demonstration, and hands-on activities using just about every modality. Incentives are needed. Rewards are tangible. There are point systems, black-and-white rules, and individual contracts. About 10 minutes of a class hour may be spent on discipline with another 15 minutes on non-teaching activities which includes students' need to talk and to unload feelings.

In the administration of the LSI, few specific problems were encountered. Students questioned the redundancy and length of the questionnaire. They were not really motivated, showing a "don't care" attitude. Some were reflective; some were impulsive in approach.

She predicted that El students would prefer an informal climate, be unmotivated, not persistent or responsible, choose visual and tactile modes, choose to work with peers, and prefer morning. She was not surprised when the results were known and believes that responses are valid for the most part.

### Learning Disabled

Ms. C is certified to teach learning disabled and educable mentally impaired. She has graduate coursework beyond the Master's degree. She has over five years experience in special education and general education.

She described the LD students as fearful of trying new things, taking a long time to trust, and being easily frustrated. These factors may appear to be laziness, but she strongly believes they are not. She also lists distractibility, non-severe behavior problems, immaturity, some physical clumsiness or poor coordination, and observable discrepancies between achievement and potential. LDs present an uneven pattern in learning, far behind in some things, but perhaps excelling in others. Emotional problems may develop as a result of the academic problems. Their relationships with general education students is considered good. LD students do have difficulty reading other people non-verbally and are unable to make the necessary inferences.

Descriptions relative to LSI variables indicate LD students are adult oriented. All three of the special education teachers consider the LD group to be more diverse than either the EMI or El group.

In describing her teaching methods, the first thing Ms. C mentioned was individualization. To be firm, compassionate, and flexible are necessary. Learning behavior is reinforced with praise, prizes, and permission to engage in certain non-academic activities in the classroom. If possible, she would like to add more visual aids and to group around tables instead of desks.

Many LD students were not able to complete the LSI independently. They approached the task reflectively and with motivation, but became impulsive and concerned about failing. They tired easily and the closely spaced format of the answer sheet seemed to produce stress; they had difficulty processing so much at one time.

Ms. C predicted that LD students would prefer a relaxed atmosphere, structure, multisensory approach, full stomach, and be adult motivated. She was not surprised by the students' preferences and believes the results are valid.

#### Summary

Differences in learning preferences between EMI and EI students were found on the following variables: unmotivated/motivated, structure, adult or

54

authority oriented, visual, late morning, and parent motivated. Probabilities ranged from .0000 to .0341.

No significant differences in learning preferences were found between EMI and LD students, allowing a .05 level of error.

Differences in learning preferences between EMI and general education students were found on the following variables: persistent, responsible, structure, adult or authority oriented, visual, and mobility. Probabilities ranged from .0000 to .0046.

Differences in learning preferences between El and LD students were found on one variable, unmotivated/motivated. The probability level was .0000.

Differences in learning preferences between El and general education students were found on the following variables: unmotivated/motivated, responsible, and mobility. Probabilities ranged from .0000 to .0046.

Differences in learning preferences between LD and general education students were found on the following variables: temperature, responsible, and visual. Probabilities ranged from .0000 to .0165.

In addition to the differences between groups, some significant group preferences were found. EMI students as a group were adult or authority oriented, preferred the visual modality, and were not persistent. El students as a group were unmotivated in general, and not parent motivated in particular.

Data from the interviews with three of the special education teachers of students in this study showed several similarities in describing EMI, EI, and LD students. Those characteristics were behavior problems, short attention span, frequent distractible or hyperactive behavior, and some underlying social problems that may manifest themselves in different ways. EMI and LD students were seen as immature and adult oriented. EI and LD students were seen as impulsive and easily frustrated. Similar teaching methods for the three groups included structure, multisensory bombardment, individualized programs, and a strong reinforcement system for academics and behavior.

### CHAPTER V

### SUMMARY AND CONCLUSIONS

#### Summary

Each category of special education impairment has been described by the characteristics commonly found within that group. In turn, children who have those characteristics tended to be identified as belonging to that group. The purpose of this study was to investigate whether different categories of special education students hold preferences for learning conditions in common that differ from one category to another and/or from non-handicapped students.

A review of the literature indicated the difficulty in finding measures that reliably distinguished between groups. There was much overlap in characteristics. A second finding in the review was that students taught and tested under their preferred learning conditions showed improved academic achievement. The third portion of the review found differences between learning disabled and non-learning disabled students on as many as six Learning Style Inventory (LSI) variables and differences between learning disabled and educable mentally impaired students on two LSI variables. The latter were not seen as significant for programming.

Four groups of students, educable mentally impaired (EMI), emotionally impaired (EI), learning disabled (LD), and general education, in grades seven to nine were given the LSI. One-factor analyses of variance on each of the 22 variables, with alpha levels of .05, were used to test six hypotheses that no differences would be found between any of the groups. Interviews with selected

57

special education teachers contributed information relative to characteristics, similarities, and differences of the groups.

Differences in learning preferences were found between the EMI and EI students on six variables. There were differences between EMI and general education students on six variables. EI and general education students differed on three variables. There were differences between LD and general education students on three variables. LD and EI students differed on one variable. No differences were found between EMI and LD students.

Some significant preferences were also found for the EMI group on three variables and for the EI group on two variables. Data from the teachers confirmed the overlap in group characteristics and tended to validate the LSI results.

#### Conclusions

Several variables elicited no statistical differences between any of the groups. These were sound, light, formal design, alone or peer oriented, learning in several sociological ways, tactile, kinesthetic, food intake, evening/morning, and teacher motivated. On some of the elements, the differences or variability within the groups, as shown by the F ratio, greatly exceeded the differences between the groups. High intra-group variability was found for sound, light, formal design, learning in several sociological ways, food intake, and evening/morning. Such variability indicated that the elements were matters of individual preference rather than identifiable with a group.

Statistical differences were found in all group comparisons except between the EMI and LD groups. If approached in a strictly quantitative manner, it might appear that the greatest difference existed between the EMI and El groups or the EMI and general education groups because differences were found on six variables. Likewise, the smallest difference would be said to be between the EI and LD students since only one variable yielded a significant difference.

This study is set in the context of establishing learning environments that most closely approximate the preferences for learning conditions held by students. Therefore, the nature of the preferences, the degree to which they complement or conflict with other preferences, and the strength of a preference itself must be viewed as having greater practical import in determining differences between the groups.

Although statistical differences were found between groups, it became apparent that most would not present problems in establishing a classroom environment, either because it was not a strong preference for one or both groups or because the preference of one group did not conflict with a preference of another group.

The reported data from the LSI indicated strong individual preferences, and group mean standard scores were drawn from that material. The fact that EMI and EI students held significantly strong preferences as groups suggests that looking for the common factors within a group would be more productive than studying differences. A qualitative analysis may then look at all the ways the categories could be grouped together. From there it could be just one step to looking at each child individually, regardless of label, and grouping by preferred learning condition. Although there are some similarities within groups, and differences between groups, the presumption of individual preferences remains.

The results of the study as reported in Chapter IV relative to each of the six null hypotheses presented a quantitative response to the questions of difference. The following conclusions were drawn in response to the research questions posed in Chapter I.

59

Question: Do EMI students hold learning preferences in common that differ from the preferences held by EI, LD, or general education students?

The EMI group showed significant preferences on the LSI for adult or authority oriented learning, the visual mode of presentation, and to not be persistent. Relatively strong preferences below the level of significance were indicated for structure, the auditory mode, parent motivated, and not to be responsible. These preferences suggested that EMI students prefer a learning environment with specific goals and assignments that are limited and short term. Frequent checking, praise, and reinforcement by adults during instruction or study times are preferred. Multisensory (visual and auditory) techniques are appropriate.

Statistical analyses indicated differences between EMI and El students on six variables. Two involved strong preferences by the EMI students (adult or authority oriented and visual). Two involved strong preferences of the El students (unmotivated and not parent motivated). On two variables (structure and late morning), both groups were within the middle range (t-scores between 40 and 60) which suggested no positive or negative effect on students' learning.

The strong adult orientation and the tendency to prefer structure shown by the EMI group were in opposition to the motivation problems of the El group relative to adults and also the preference of the El group for a less structured learning environment. These were substantive differences that have implications for classroom programming.

No statistical differences were found between the EMI and LD groups. Data from the teachers' interviews referred to intellectual and academic differences between the two groups but mentioned several characteristics and teaching methods common to both. The only difference suggested by the LSI was in the preference for a visual mode of instruction, but there were no implications

60

for the learning environment as both groups were above the mean in preferences for the visual mode.

There were statistical differences between EMI and general education students on six variables. Three involved strong preferences of the EMI group (adult or authority oriented, visual, and not persistent). Both groups were within the middle range on the remaining three variables (structure, mobility, and responsible). The general education group held no strong preferences; all preferences fell within the middle range. There did not appear to be differences between the groups that have implications for programming.

Question: Do El students hold learning preferences in common that differ from the preferences held by EMI, LD, or general education students?

According to the results of this study, El students had significant problems in motivation. They were not self motivated or parent motivated, and they tended not to be teacher motivated. Additional preferences below the levels of significance were for warmer temperature, to learn alone or with peers, to have a lesser degree of structure, not to learn in late morning or afternoon, and not to be responsible.

It should also be noted here that the El students, as a group, received tscores ranging from 35 to 43 on five of the six emotional elements. None of the other groups had such consistently low preferences on these variables (unmotivated/motivated, responsible, structure, parent motivated, teacher motivated).

The teacher reported that the El students needed structure but they did not want it. She stated they performed better at the beginning of the day and they needed mobility. She also described them as unmotivated, low in persistence and responsibility, and not adult oriented learners.
The differences between the EI and EMI groups have been cited in the section pertaining to EMI students. The groups were found to be different not only in degree but also instructionally when the student-adult relationship and preferences for structure were considered.

Differences in motivation were found between EI and LD students. EI students were unmotivated while LD students were in the middle range, but in the direction of low motivation. This diminished its practical significance as a difference between the two groups.

There were statistical differences between EI and general education students on three variables. On two (responsible and mobility), both groups were in the middle range although the EI group tended to prefer less responsibility. One variable (unmotivated) involved a strong preference of the EI group.

Based on the definition of emotional impairment, these differences were not unexpected. These differences would not be sufficient for determining that El students and general education students need different and separate learning environments.

Question: Do LD students hold learning preferences in common that differ from the preferences held by EMI, EI, or general education students?

The LD students held no significant preferences as a group. They showed only a tendency to prefer learning in an adult or authority dominated setting.

There were conflicting findings on the adult or authority oriented variable between Price (1982) and Wild (1979) and between Dean (1982) and this study. These differences cannot be explained on the basis of grade level. The teacher of the LD students spoke of their being motivated by parents and by teachers once trust had been established. No conclusions relative to a preference of LD students for adult or authority oriented learning situations should be drawn at this time.

No differences were found between the LD and EMI groups.

The only significant difference between LD and El students was in motivation. This was primarily a difference of degree as the LD group was in the low middle range on this variable. Instructional methods that spoke to the low motivation of the El students would not conflict with preferences held by LD students as a group.

Differences were found between LD and general education students on three variables (visual perception, temperature, and responsible). In each case the mean group score was within the middle range with t-scores between 40 and 60. Since middle range scores indicated no negative or positive influence on learning, no differences in learning environments were indicated.

#### Implications

The most important implications from this study appear to be those relative to program placement. While the aim of this study was to look at the preferences that might be identified with each group and how the groups might differ, it has become apparent that the differences within each group may have greater implications for the grouping process.

If the special education groups do not have preferences in common that distinguish among the groups, then preferences should be viewed as individual characteristics. Individual preferences suggest that grouping by category may not be the most efficient or appropriate means of instructional grouping. The categories, or labels, tend to set expectations and, consequently, the parameters of each program.

The grouping of students by category or label implies that homogeneous groups will be the result. However, each impairment encompasses a wide range of aptitudes, levels of skills, and deficits. Grouping by category does not assure the teacher of a homogeneous group. On more than one fourth of the elements, intra-group variability exceeded inter-group variability. Another quarter did show some differences between groups but not approaching a level of significance. The degree of intra-group variability attests to the individual nature of preferences on almost half of the variables.

If achievement, or learning, improves when classroom conditions are matched to the students' preferences for learning conditions, then preferences appear to be more valid than label or category as an approach to grouping.

Classrooms tailored to preferences may see a reduction in behavior problems during periods of instruction and, thus, an increase in actual instructional time. The conclusions drawn from this study may have implications for two additional types of decisions which are made relative to special education students: diagnosis of impairment and development of an appropriate learning environment.

EMI students were found to prefer adult oriented learning, structure, and not to be persistent. Categorization as EMI is legally based not only on cognitive and academic performance, but also on adaptive behavior. Therefore, it could be diagnostically useful to examine any measures of adaptive behavior for such factors as dependence on adults, need for structure, and not being persistent. While the presence of these characteristics would not be sufficient for categorization of a student as EMI, it does provide additional data for the individual educational planning committee (IEPC) to consider.

The diagnostic evaluation of emotional impairment must rule out social maladjustment as the cause of behavior problems. Students who are socially

maladjusted or delinquent are within the general education population and often referred for a diagnostic evaluation to determine whether an emotional impairment exists as defined by state and federal guidelines. It is sometimes difficult to distinguish between emotional impairment and delinquency under the current legal definition. The information from this study suggested significant differences between EI and general education students on dimensions of motivation and responsibility. These differences could be useful to the IEPC in distinguishing between emotional impairment and social maladjustment.

In developing a learning environment for an EMI group, the teacher should recognize the strong dependence of EMI students upon adult direction and the positive effect of adults on motivation. Not only is structure considered necessary in teaching this group, it tends to be preferred by the students. Their inability and/or unwillingness to be persistent also suggests the need for a structured learning environment with strong teacher supervision. The students may also develop greater responsibility with these teaching methods.

El students may not want structure, according to both the LSI and the teacher interview, but it is considered necessary. The teacher takes this conflict between preference and need into consideration when s/he structures the options allowed the students. Teachers of El students are also well aware of the difficulties in motivating appropriate academic behavior. As students reach junior high school age, many parents find they are no longer able to motivate learning behavior. This problem may be exaggerated with El students. Teaching strategies provide many short term successful experiences in an attempt to develop intrinsic motivation.

Learning environments could be established for the students in this study, based on preferences for learning conditions, that would cut across categories. With the exception of the EMI-EI combination, the differences in preferences

found among the groups were not qualitatively great enough to warrant instructional groupings based on category or label.

The results of this study suggested that the learning preferences of EMI and LD students could be accommodated if they were placed together. The results also indicated that LD and EI students could be compatibly grouped. The learning preferences of general education students were compatible with each special education group. Instructional programming that spoke to the preferences of the special education groups should not have a negative effect upon general education students.

Analysis of the differences between the EMI and El groups showed significant diversity or polarization on factors involving motivation and adult orientation. These were qualitative differences that suggested difficulty in structuring a learning environment to meet the needs of these two groups in a combined setting.

It is granted that even where there is cognizance of learning preferences, a variety will be found in the classroom, for as two students may agree on the amount of light in a work area, they may not agree on the temperature. This is magnified by the number of strong preferences to be accommodated. Therefore, the teacher will need an individualized approach to meet these varying preferences. Several individualized teaching programs are described in curricular literature. Curriculum that emphasizes the individual is able to respond to differences in preferences held by individuals.

It appears that special education curricula, even though labelled EMI or El or LD, must share so many things in common that few instructional benefits can accrue from such a division. To say that a student is EMI or El or LD does not imply any particular curriculum or instructional style. This overlap of characteristics was especially demonstrated in the teacher interviews in the descriptions of students and of the instructional methods used by each teacher. However, to say that a student has strong preferences for structure, to work alone, or to learn in a formal setting does have very specific implications for teaching that individual.

#### Reflections

Comments here will reflect on some questions that came to mind while conducting this study and indicate more curiosity than suggestions for further study.

It is sometimes difficult in evaluating a student for possible special education services to determine the exact nature of the impairment. It may be easy to ascertain that a handicap exists but hard to label it. Why is it necessary to distinguish among the higher incidence handicaps? A parallel question asks why teachers are certified in different impairment areas. It seems that information about materials, approaches, and nature of the impairment would be appropriate but that actual teaching skills should be the same for all children.

In looking at other studies which have attempted to determine the best predictors of special education category, the IQ has emerged as the most consistent. General education has moved away from ability grouping for instruction. Obviously IQ is significant for EMI certification, but why should it be a discriminating factor in LD and EI certification?

One factor that was common to students of all three disability areas was difficulty in developing appropriate strategies for problem-solving. Is this perhaps more critical for success in the general education program than the specific skills required for decoding words, performing math calculations, or writing a comprehensible passage, and is this the deficit that brings the child to special education? One study cited in Chapter II (Miller, 1983) found that clinical observations of attention deficit could not be supported. Increased structure and teacher direction increased attending behaviors. If teachers assume more of the decision-making role (as structure on the LSI is defined), will this reduce the level of responsibility of the student and thus create another kind of problem?

The field of study called cognitive styles or learning styles is manyfaceted. Credibility for several of the theories has not yet been established. Many include psychological factors within the child that are difficult to identify and even more difficult to translate into behavioral terms for use in classroom programming. The LSI appeared to deal with factors in the classroom or home study environment that could be fairly readily adjusted by a teacher, parent, or even by the student.

It was, however, the group of emotional elements which turned out to suggest the greatest differences among the groups. These are the elements that seem to have the least to do with classroom conditions and instructional choices. The elements of motivation, persistence, responsibility, and desire for structure seem to be within the emotional make-up or character of the child rather than being a preference one might have for elements such as noise or light. Thus if one is interested in the atmosphere or the ecology of the classroom, might the focus be more appropriately placed on the environmental, sociological, and physical factors? These factors include the elements which showed the most intra-group variability and least relationship to a group identity.

If matches between preferences and conditions do lead to improved learning, the variability shown within the categories suggests that grouping by category is not going to provide the optimum match. Is achievement, therefore, hampered by the current grouping practices?

The EMI and El students in this study did, in fact, hold some significantly strong preferences as groups. This might be seen as supporting categorical grouping which tends to focus on differences between groups. However, the results also indicate that there are more differences within the groups than between the groups. If non-categorical grouping is to be considered, then attention must be directed to finding areas of similarity among the students that might become the bases for instructional grouping. Might grouping of El, EMI, and LD students by preferred learning condition be a viable alternative to grouping by label?

The teacher interviews were interesting and the most personally rewarding segment of this study as well as being educationally relevant to the topic being studied. The teachers were able to describe the strengths and weaknesses of students in their classrooms. It became evident that the groups share many characteristics. From their observations they were also able to identify some of the preferences indicated by the groups. While they may have learned of some preferences of specific individuals, it is doubtful that they gained many new insights about the groups with whom they work.

If the ethnographic approach is used in conjunction with some form of quantifiable instrumentation, it appears that the researcher has access to the richest fund of information relative to the ecology of the classroom. The ethnographic approach might suggest the specific areas to be measured; or, the measurement might be the jumping-off point for an ethnographic study.

The groups in this study are believed to be representative not only of special education in the target district, but also of the broader range of students identified under the guidelines of PA 451. The smaller numbers involved may limit the degree to which these results can be generalized, however.

#### Recommendations

It is suggested that future studies on special education concentrate on the factors relevant to instructional grouping of students that go beyond a categorical label. The use of the LSI as an instrument may be an appropriate starting point. The environmental, sociological, and physical factors include those elements of the classroom most controllable by the teacher. The emotional elements may belong in a different type of study that is looking at student characteristics.

Federal law (PL 94-142) and state law (PA 451) define the special education categories and set forth the criteria for determining eligibility. Evaluators and school district policies interpret and implement these laws with individual variation. Therefore, it is strongly suggested that researchers apply a strict interpretation and narrow definition in selecting students from the special education categories.

If learning preferences, such as those on the LSI, were to be considered as the basis of grouping, some question might arise as to which preferences would be considered of major importance. Research on the LSI has already shown increased achievement where conditions and preferences are matched. Future studies might look at whether the matches on certain elements show greater achievement gains than the matches on other elements.

Another line of study might look at whether certain factors in a child's early years can be identified with later learning preferences as a student. A corollary question would be whether learning preferences can be re-directed.

Instructional time, or time on task, is used to measure the efficiency of teaching, and from this learning may be inferred. The special education teachers interviewed as part of this study cited the great amount of time they spent on

task. Could this increased time on task be the critical factor in the improved achievement shown where preferences and conditions are matched? APPENDICES

APPENDIX A



## APPENDIX A

## R 340.1705 DETERMINATION OF EDUCABLE MENTALLY IMPAIRED

**Rule 5.** (1) The educable mentally impaired shall be determined through the manifestation of all of the following behavioral characteristics:

- (a) Development at a rate approximately 2 to 3 standard deviations below the mean as determined through intellectual assessment.
- (b) Scores approximately within the lowest 6 percentiles on a standardized test in reading and arithmetic.
- (c) Lack of development primarily in the cognitive domain.
- (d) Impairment of adaptive behavior.

(2) A determination of impairment shall be based upon a comprehensive evaluation by a multidisciplinary evaluation team which shall include a psychologist.

(3) A determination of impairment shall not be based solely on behaviors relating to environmental, cultural, or economic differences.

APPENDIX B

### APPENDIX B

#### R 340.1706 DETERMINATION OF EMOTIONALLY IMPAIRED

**Rule 6.** (1) The emotionally impaired shall be determined through manifestation of behavioral problems primarily in the affective domain, over an extended period of time, which adversely affect the person's education to the extent that the person cannot profit from regular learning experiences without special education support. The problems result in behaviors manifested by 1 or more of the following characteristics:

- (a) Inability to build or maintain satisfactory interpersonal relationships within the school environment.
- (b) Inappropriate types of behavior or feelings under normal circumstances.
- (c) General pervasive mood of unhappiness or depression.
- (d) Tendency to develop physical symptoms or fears associated with personal or school problems.

(2) The term "emotionally impaired" also includes persons who, in addition to the above characteristics, exhibit maladaptive behaviors related to schizophrenia or similar disorders. The term "emotionally impaired" does not include persons who are socially maladjusted, unless it is determined that such persons are emotionally impaired.

(3) The emotionally impaired shall not include persons whose behaviors are primarily the result of intellectual, sensory, or health factors.

(4) A determination of impairment shall be based on data provided by a multidisciplinary team, which shall include a comprehensive evaluation by both of the following:

- (a) A psychologist or psychiatrist.
- (b) A school social worker.

(5) A determination of impairment shall not be based solely on behaviors relating to environment, cultural, or economic differences.

APPENDIX C

## APPENDIX C

#### R 340.1713

## "SPECIFIC LEARNING DISABILITY" DEFINED; DETERMINATION

**Rule 13.** (1) "Specific learning disability" means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain disfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, of autism, or of environmental, cultural, or economic disadvantage.

(2) The individualized educational planning committee may determine that a child has a specific learning disability if the child does not achieve commensurate with his or her age and ability levels in 1 or more of the areas listed in this subrule, when provided with learning experiences appropriate for the child's age and ability levels, and if the multidisciplinary evaluation team finds that a child has a severe discrepancy between achievement and intellectual ability in 1 or more of the following areas:

- (a) Oral expression.
- (b) Listening comprehension.
- (c) Written expression.
- (d) Basic reading skill.
- (e) Reading comprehension
- (f) Mathematics calculation
- (g) Mathematics reasoning.

(3) The individualized educational planning committee shall not identify a child as having a specific learning disability if the severe discrepancy between ability and achievement is primarily the result of any of the following:

- (a) A visual, hearing, or motor handicap.
- (b) Mental retardation.

- (c) Emotional disturbance.
- (d) Autism.
- (e) Environmental, cultural, or economic disadvantage.

(4) A determination of impairment shall be based upon a comprehensive evaluation by a multidisciplinary evaluation team, which shall include at least both of the following:

- (a) The child's regular teacher or, if the child does not have a regular teacher, a regular classroom teacher qualified to teach a child of his or her age or, for a child of less than school age, an individual qualified by the state educational agency to teach a child of his or her age.
- (b) At least 1 person qualified to conduct individual diagnostic examinations of children such as a school psychologist, a teacher of speech and language impaired, or a teacher consultant.

APPENDIX D

# APPENDIX D

## R 340.1721d RESPONSIBILITIES OF THE INDIVIDUALIZED EDUCATIONAL PLANNING COMMITTEE

**Rule 2Id.** (1) Persons identified as being handicapped shall receive special education programs and services pursuant to the individualized educational planning committee program or pursuant to the final decision on an appeal.

(2) The individualized educational planning committee shall do all the following:

- (a) Determine the eligibility of persons suspected of being handicapped or review eligibility after the 3-year evaluation. A person is eligible, as a statutory right, for special education programs and services if the person is identified as having I or more of the impairments defined in part I of these rules, is not more than 25 years of age as of September I of the school year of enrollment, has not completed a normal course of study, and has not graduated from high school. A person reaching the age of 26 years after September I is entitled to continue in a special education program or service until the end of that school year.
- (b) Consider the need for a change in the educational status for eligible handicapped persons.
- (c) Develop, review, or revise each handicapped person's individualized education program annually.

(3) The individualized planning committee shall submit its report to the superintendent immediately upon completing the individualized educational program. The individualized educational planning committee may, after considering the least restrictive environment, recommend where the program and services may most appropriately be provided and may identify for the superintendent the assignment options that were considered and the reasons why the recommended option was chosen. The report of the committee shall not be restricted to the programs and the services available. In addition, the individualized education program shall not determine how the programs and services shall be delivered, except where such is an integral part of the placement of service itself.

#### R 340.1721e INDIVIDUALIZED EDUCATIONAL PLANNING COMMITTEE MEETING; DETERMINATION OF ELIGIBILITY FOR SPECIAL EDUCATION PROGRAMS AND SERVICES; INDIVIDUALIZED EDUCATION PROGRAM

**Rule 2le.** (1) The superintendent shall convene an individualized educational planning committee meeting.

(2) The participants shall determine if the student is eligible for special education programs or services, or both. Eligibility shall be determined by the committee after receipt and review of the multidisciplinary team report and recommendation, and after consideration of any additional information presented by the participants. If a student is determined to be handicapped, the committee shall write an individualized education program or may reconvene for this purpose. In either event, the time line specified in R 340.1721c(2) shall apply.

(3) An individualized education program shall be based on all diagnostic, medical, and other evaluative information requested by the committee or provided by the parent or handicapped person and shall include all of the following information in writing:

- (a) A statement of the person's present level of educational performance.
- (b) A statement of annual goals, including short-term instructional objectives.
- (c) The projected dates for initiation of services and the anticipated duration of the services.
- (d) Appropriate objective criteria and evaluation procedures and schedules for determining whether the instructional objectives are being achieved.
- (e) A statement of the specific special education and related services to be provided to the person, giving consideration to the accessibility of physical facilities; transportation, including the need, if any, for aids or restraints; and room and board.
- (f) The extent to which the person is able to participate in regular education programs.

(4) Any participant in the committee's deliberations who disagrees, in whole or in part, with the committee's determination may indicate the reasons therefore on the committee's individualized education program report or may submit a written statement to the attached to the report.

APPENDIX E

# APPENDIX E

## OUTLINE OF QUESTIONS FOR FIRST TEACHER INTERVIEW

- A. Experience and philosophy of teacher
  - I. Teaching
    - a. Certification
    - b. Years taught
    - c. Training level
    - d. Other experiences with this age group
  - 2. Describe the (LD) (EMI) (EI) student at the intermediate grade level.
  - 3. How does this differ from other groups? from general education?
  - 4. What do you consider to be your primary responsibility to students in your class? (Rank the following.)
    - a. Academic
    - b. Social skills and interaction
    - c. Personal growth and development
    - d. Encouragement of educational or occupational aspirations
  - 5. What percentage of responsibility for achievement (learning) would you assign to each of the following?
    - a. Parents
    - b. Teachers
    - c. Students
    - d. Other (please specify)
  - 6. Who is the most help you to in your job?

- B. Teaching methods
  - I. Describe your teaching style and methods in the (LD) (EMI) (EI) classroom.
  - 2. How does this differ from teaching in the other groups?
  - 3. In a typical instructional period, how much time do you spend on each of the following?
    - a. Discipline
    - b. Non-teaching activities
    - c. Instruction
  - 4. How do you reinforce learning behavior?
  - 5. What kind of grouping do you do?
  - 6. If allowed, what changes would you make in each of the following?
    - a. Instruction
    - b. Classroom conditions
    - c. Student scheduling or grouping
    - d. Other
  - 7. Realistically, what changes could you make?
  - 8. What kinds of things related to teaching methods would you be prohibited from doing?
  - 9. To what extent does your particular teaching style (as opposed to other styles) affect the achievement of your students?
- C. School setting and climate
  - 1. What is the reputation of the (LD) (EMI) (EI) program in this area?
  - 2. Give three words or phrases that would be used in describing special education by each of the following.
    - a. General education teachers
    - b. Special education parents
    - c. Community

- 3. Describe the relationship of each of the following.
  - a. Your students with general education students
  - b. Special education teachers with general education teachers

# D. Expectations

- 1. How do you decide if or when learning is taking place?
- 2. To what degree are you satisfied with the students' learning?
  - a. Extremely well satisfied
  - b. Fairly well satisfied
  - c. Neither satisfied nor dissatisfied
  - d. Not very satisfied
  - e. Dissatisfied
- 3. To what extent do you feel that your expectations affect achievement?
  - a. Great
  - b. Some
  - c. Very little
- 4. What expectations does the school administration in general have for special education?
- 5. What percentage of your students do each of the following?
  - a. Try to improve
  - b. Are content to get by
  - c. Don't care
- 6. What percentage do you think will do each of the following?
  - a. Graduate
  - b. Live satisfying lives in 15 years
- 7. Where do your students find their emotional support?

- 8. What predictions would you make for (LD) (EMI) (EI) students on the LSI?
- 9. Do you have any predictions for particular students?
- E. LSI administration
  - I. How long did it take you to give it?
  - 2. Were there any particular difficulties for you?
  - 3. What was the attitude and approach of the students while taking the LSI?
    - a. Motivated
    - b. Didn't care
    - c. Reflective
    - d. Impulsive
  - 4. Did they have any particular difficulties with any of the following?
    - a. Length
    - b. Vocabulary
    - c. Format
    - d. Other
  - 5. Were there any unusual comments or reactions?

### OUTLINE OF QUESTIONS FOR SECOND TEACHER INTERVIEW

A. Previous interview

Each of you cited 10% as "don't care" compared to those who try to improve or are content to get by.

- I. Are these 10% reachable?
- 2. By what means?
- 3. Does this figure apply to general education students?
- B. Surprises
  - 1. Were you surprised by any of the preferences (high or low) given by (LD) (EMI) (EI) students?
  - 2. Were you surprised by any individual preferences?
  - 3. Were surprises related to the following?
    - a. The factor
    - b. The direction of preferences
    - c. The degree of preference
  - 4. Do you feel responses were valid?
  - 5. How do you explain differences between LSI results and your expectations or perceptions?
- C. Comments
  - I. To LSI results (as reported by test developer)
  - 2. Do these describe the categories as you have known them historically or are they relevant only to this group?
- D. Uses of this information
  - I. Is this usable information for each of the following?
    - a. School
    - b. Home
    - c. Individuals

- 2. If so for school, how has this affected or will it affect your instruction or classroom?
- 3. Have you gotten any feedback from the following?
  - a. Students
  - b. Parents
- 4. What is the role or responsibility of the teacher in tailoring learning environments to preferences?
- 5. Will students' learning be affected? in what ways?

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