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Educationally Handicapped Children: A Comparative Study Of Academic Achievement, Creativity And Locus Of Control With Students In Learning Disability Groups And Special Day Classes, Grades Three And Four

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EDUCATIONALLY HANDICAPPED CHILDREN: A COMPARATIVE STUDY OF ACADEMIC ACHIEVEMENT, CREATIVITY AND LOCUS OF CONTROL WITH STUDENTS IN LEARNING DISABILITY GROUPS AND SPECIAL DAY CLASSES, GRADES THREE AND FOUR

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ABSTRACT

PURPOSE:

The purpose of this study was to survey learning disability students and students in special day classes and to compare them on select characteristics to each other and to children attending regular day classes.

VARIABLES:

The selected variables for this study were creativity, locus of control, and academic achievement. Each of these variables was divided into sub-parts permitting a more inclusive consideration. Creativity was measured for the factors of fluency, flexibility, originality, and elaboration. Locus of control was separated into three parts, each measuring one of the following: student responsibility for academic failure, (I-); responsibility for academic success, (I+); and a composite of these two (I Total). Academic achievement was measured by the use of diagnostic Stanford Reading and Stanford Arithmetic tests. The following skills were tested in the area of reading: reading comprehension, vocabulary, auditory discrimination, syllabication, beginning and ending sounds, blending, and sound discrimination. The diagnostic arithmetic test had thirteen subtests. Only seven of the subtests were used and these were number system and counting, operations, decimal place value, addition, subtraction, concepts total, and computation total.

POPULATION:

The population of this study consisted of forty randomly selected elementary students in special programs for the educationally handicapped. Twenty of the students were enrolled in learning disability groups while the remaining twenty students attended special day classes for educationally handicapped minors. All of the students were in either the third or fourth grade level school placement and attended the Napa Valley Unified School District.

PROCEDURES:

The forty students were divided into one of four groups according to I.Q. and educational classification. This allowed the researcher to control the I.Q. while examining the twenty-one variables. Analysis of variance was used. When comparing students in special day classes and students in learning disability groups to normative data, the t-test was utilized.

FINDINGS:

Achievement 1. Special day class students are academically more deficient than learning disability students in understanding the number system, knowing decimal place notation, doing addition. These results were significant at the .05 level of confidence.

2. As expected, students in learning disability groups and students in special day classes are below regular students in all academic areas (significant at the .01 level).

Creativity 1. Students in learning disability groups are more flexible than students from special day classes.

2. Both students from learning disability groups and students from special day classes were less elaborate but more original in their responses than regular students.

Locus of Control 1. Students in learning disability groups and students in special day classes were less able to take responsibility for their academic successes than regular students. There is some indication that both students in learning disability groups and students in special day classes do not take responsibility for their academic failures. In general, these two types of students see the world as externally controlled.

DEDICATED TO

TEACHERS OF HANDICAPPED CHILDREN

ACKNOWLEDGEMENTS

Several people have assisted me in this project. Recognition to the Napa teachers of educationally handicapped minors is extended for their cooperation. The coordinator of these programs, Mr. Richard Owen, and his office staff are to be thanked for their many hours devoted to this study. Also, David Rekdahl, past chairman of the Napa County Admission Committee, is acknowledged for his assistance.

The suggestions and guidance of my dissertation committee, namely Dr. Helmut Riemer (chairman), Dr. Preston Gleason, Dr. Cy Coleman, Dr. Andrew Key, and Dr. Jerald Nelson were appreciated.

Gratitude for the help and encouragement of Dr. "Win" Bachmann is warmly given.

Lastly, my special appreciation is bestowed to my wife whose love, endurance, encouragement, and faith made possible the completion of this study.

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CHAPTER I

INTRODUCTION

The California Public School System offers a variety of programs to meet children's individual educational needs. The newest program in the area of Special Education is for educationally handicapped minors.[1] Research relating to educationally handicapped students is plentiful. However, because of the confusion in terminology and the extensive use of different descriptive terms, the reader cannot be sure that what he reads applies to this specific category as mandated by the California Legislature. Therefore, often the reader must extrapolate available information in an attempt to gain some insight into the traits of these children.

This dissertation is an attempt to fill this information gap by doing research with children who are placed into two of the specific categories which fall under the more general category of educationally handicapped minors as defined by California law.

The need to further define the characteristics of these educationally handicapped students is clearly indicated in current literature. Therefore, this dissertation is an attempt to meet this need.

The research within this dissertation has been limited to children

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[1] Operation and Results of Special Educational Programs for Educationally Handicapped Minors, Report to the Governor and the State Legislature of California, Sacramento, California, 1967 (Sacramento, Calif.) California State Department of Education, 1967), p. 1.

who are placed into two of the three educational programs for educationally handicapped minors (EH) as defined by the California law, namely those who are enrolled in learning disability groups (LDG) and those in special day classes (SDC).[2,3]

The selection of a student for either program is determined by an admission committee. The main determinants of the child's placement are (1) the behavior of the child and (2) the learning disability of the child. If a behavior problem is the primary reason for referral to the admission committee, the child is usually placed in a special day class for educationally handicapped minors. When the learning difficulty is primary, the student is placed in a learning disability group. However, if the child has a learning problem of sufficient magnitude which prevents him from functioning in a regular class even on a limited basis, he may be placed in a special day class. The admission committee may also determine that a child is beyond the scope of either of these two programs and place him on home teaching and/or refer him to other agencies for care and treatment.[4] (See Table 1.)

David Rekdahl, chairman of Napa's Admission Committee for screening educationally handicapped students from 1967 to 1970, commented that the

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[2]The other categories such as home teaching or hospital programs will not be included.

[3]See Pages 5 and 6 for a definition of the terms "educationally handicapped minors," "learning disability groups," and "special day classes."

[4]California Education Code. Sec. 6755 (1969).

main distinction between the child placed in a special day class and a child placed in a learning disability group is the degree of emotional lability (involvement) as related to classroom behavior and the extent of the learning disability.[5]

TABLE I

STUDENT SELECTION PROCEDURES FOR PLACEMENT IN EDUCATIONALLY HANDICAPPED PROGRAMS: SPECIAL DAY CLASSES AND LEARNING DISABILITY GROUPS

		Behavior Problem	Learning Disability
Special Day Classes for EH Minors (SDC)	(1)	Serious	a) no b) mild
	(2)	a) no b) mild	Serious
Learning Disability Groups (LDG)	(3)	a) no b) mild	Mild

THE PROBLEM

The purpose of this study is to compare the learning disability group (LDG) and special day class students (SDC) on selected characteristics related to behavior and learning problems.

The research will be limited to grades three and four and will incorporate three parameters: 1. academic achievement, 2. divergent thinking (creativity), and 3. locus of control. In addition the

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[5]David Rekdahl, a private interview, Napa, California, September, 1970.

socio-economic status of each student will be presented. This is included for the purpose of further defining the population of this study, therefore, no statistical analysis will be made beyond the presentation of median and range scores.

The subjects were selected from an existing population who were certified as educationally handicapped by Napa County's Admissions Committee. Two per cent of the total school district enrollment may be certified as educationally handicapped,[6] however, permission to exceed this limitation may be granted by the Superintendent of Public Instruction.[7]

Some of the information used in assessing the EH students for placement and educational planning was incorporated in this research project. This information included: 1. diagnostic reading scores, 2. diagnostic arithmetic scores, and 3. intelligence scores as determined by individual intelligence tests.[8]

Following is a brief discussion of the three main parameters with a full explanation included in Chapter III.

1. Academic achievement. The Stanford Diagnostic Reading Test and the Stanford Diagnostic Arithmetic Test were chosen because their

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[6]Since the Napa Unified School District has 15,000 students, three hundred students may be qualified for programs for educationally handicapped minors, according to Richard Owen, Coordinator of Programs for Educationally Handicapped Minors in Napa Unified School District, in a private interview, Napa, California, January, 1971.

[7]California Educational Code, Sec. 6752 (1969).

[8]A preliminary survey of this population revealed that 74/87 or 85% of these children had been given a WISC.

scores reveal the student's educational strengths and weaknesses. This information is useful when individualizing the teaching program.

2. Divergent thinking. The Figural battery of the Torrance Tests of Creative Thinking was selected to study the student's divergent thinking. Since divergent thinking is a factor of human intelligence and a fairly new concept in the area of intelligence testing,[9] it offers a meaningful and literally untapped territory to explore. In addition, some theories of creativity (e.g., psychoanalytical theory) link creativity and neurotic conflict.[10]

3. Locus of control. Virginia Crandall and her associates developed the intellectual Achievement Responsibility Questionnaire Scale (IAR) which was used. This test measures (1) the student's perception of controlling forces, both external or internal in origin, and (2) the student's feelings concerning the direction of the "reinforcement responsibility exclusively in intellectual-academic achievement situations."[11]

PURPOSE

The purpose of this study was to determine whether EH students

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[9]J. P. Guilford, Intelligence, Creativity and Their Educational Implications, San Diego: Robert R. Knapp, pub. 1968, pp. 3-32.

[10]Maria C. C. Villas-Boas "A Study of the Motivational Role of Self-concept and Locus of Control in Creative Children" *unpublished Doctoral Dissertation, The University of California, Berkeley, 1967), p. 3.

[11]Virginia Crandall, Walter Katkovsky, and Vaughn J. Crandall, "Childrens' Beliefs in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development XXXVI (March, 1965), 93.

placed in learning disability groups differed significantly on the three main parameters from EH students in special day classes. In addition, these students were compared to the standard elementary school population by means of normative data. Socio-economic information was provided for further elaboration on this population.

DEFINITION OF TERMS

1. Educationally Handicapped Minor

Educationally handicapped are . . .

Minors who by reason of marked learning or behavior disorder or both, require the special education programs /learning disability groups; special day classes; home, hospital, or regular established non profit, tax-exempt, licensed children's institution programs/ . . . with the intention of full return to the regular school program. Such learning or behavior disorder shall be associated with a neurological handicap or emotional disturbance and shall[12] not be attributed to mental retardation.[13]

2. Special Day Classes (elementary and secondary)

Under this program educationally handicapped pupils unable to function in a regular class are assigned to a specific class. The special class shall be maintained for a minimum or more school day. In this special program fundamental school subjects shall be emphasized as prescribed by the State Board of Education.[14]

For special day classes the maximum enrollment shall be 12 pupils per class.[15]

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[12]In California's Educational Code (1969) Section 36 defines "shall" as meaning mandatory and "may" as meaning permissive.

[13]California Educational Code, Sec. 6750 (1969).

[14]Ibid., Sec. 6751a.

[15]Ibid., Sec. 6751.1.

3. Learning Disability Groups (elementary and secondary)

"In this program, the pupil remains in his regular class but is scheduled for individual or small group instruction given by a special teacher."[16] "For learning disability groups the maximum enrollment shall be 32; however, participation in any given learning disability shall be for at least 30 minutes and shall not exceed eight pupils at any one time."[17]

4. Admission Committee (its duties and members)

> Admission of minors to programs for the educationally handicapped . . . shall be made only on the basis of an individual evaluation according to standards established by the State Board of Education and upon individual recommendations of a local admission committee which shall include a teacher, a school nurse, or social worker, a school psychologist or other pupil personnel or supervisor, and a licensed physician. Such recommendation shall include a statement, that in the professional judgement of the members of the local admission committee the minor is recommended for placement in a program for educationally handicapped minors to correct a marked learning disability due to neurological handicapped or emotional disturbance and that he may be expected to eventually participate in the regular school program. Any member of the local admission committee dissenting from the final committee recommendation shall attach to the final recommendation a statement of reason for such objection.[18]

The child cannot be placed for more than one year by the admission committee unless at the end of the admission period, the committee reevaluates the child and states why the child should remain in one of these special programs for the educationally handicapped.[19]

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[16] Ibid., Sec. 6751b. Since funding is a reality of educational planning, a one-to-one teacher-pupil ratio is not, in most cases, possible.

[17] Ibid., Sec. 6751.1.

[18] Ibid., Sec. 6755.

[19] Ibid., Sec. 6755.1 and 6755.2.

5. Creativity

The following is an operational definition of creativity devised by the researcher. It was designed to be congruent with the four factors of creativity used by the Torrance tests of Creative Thinking which are fluency, flexibility, originality, and elaboration.[20]

A creative person is one who is able to take an ambiguous stimulus and organize it into meaningful structure(s) and then communicate the results. In addition, the person must have elaborated upon the stimuli, produced original response(s), and been flexible and fluent in dealing with the stimuli. (a) Elaboration is defined as the ability to develop detail. (b) A response is considered original if it is statistically infrequent (usually less than the 5% level). (c) Flexibility is the ability to organize the stimuli into several different structures or categories. (d) Fluency is the ability to give several responses within a structure or category.

6. Locus of Control

Locus of control describes the perceived direction of the controlling forces in one's life. If a person believes he controls his own actions, thoughts and direction in life he has an internal locus of control. On the other hand, if the person believes that the control of his thoughts, action or "style of life" is regulated by others or things and not by himself then he has an external locus of control.[21]

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[20]Paul Torrance, Torrance Test of Creative Thinking: Direction Manual and Scoring Guide (Princeton: Personnel Press, 1966), pp. 10-43.

[21]Julian B. Rotter, "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs: General and Applied, 80 (Whole No. 609, 1966), 1.

LIMITATIONS AND ASSUMPTIONS

For the purpose of this study the following limitations and assumptions are set forth:

1. Children attending Napa Valley Unified School District are representative of the general school population. Furthermore, the students attending this school district who are certified by the local admission committee as educationally handicapped students are typical of the general educationally handicapped populations in California.

2. Children with learning disorders and/or emotional problems are testable using group and/or individual testing procedures.

3. The local admission committee for programs for the educationally handicapped follows the State requirements with respect to evaluation and placement of students. This assumes, then, that students certified as educationally handicapped have a marked learning and/or behavior disorder, and these disorders shall be associated with a neurological handicap or emotional disturbance and not mental retardation.

HYPOTHESES

1. There will be a significant difference in academic areas between students in learning disability groups and students in special day classes for minors who are classified as educationally handicapped.

1a. There will be a significant difference in academic areas between students in learning disability groups and students in regular classes.

1b. There will be a significant difference in academic areas between students in special day classes for minors who are classified as educationally handicapped and students in regular classes.

2. There will be a significant difference in creativity between students in learning disability groups and students in special day classes for minors who are classified as educationally handicapped.

2a. There will be a significant difference in creativity between students in learning disability groups and students in regular classes.

2b. There will be a significant difference in creativity between students in special day classes for minors who are classified as educationally handicapped and students in regular classes.

3. There will be a significant difference in locus of control between students in learning disability groups and students in special day classes for minors who are classified as educationally handicapped.

3a. There will be a significant difference in locus of control between students in learning disability groups and students in regular classes.

3b. There will be a significant difference in locus of control between students in special day classes for minors who are classified as educationally handicapped and students in regular classes.

CHAPTER II

REVIEW OF THE LITERATURE

The organization of Chapter II is based upon the three major areas of the study in respect to the educationally handicapped children selected. These areas are: 1. academic achievement, 2. creativity, and 3. locus of control. Two other areas which are needed to understand the complexity of educationally handicapped children are nomenclature and behavioral characteristics. These then, constitute the five major divisions of this chapter.

NOMENCLATURE

By surveying the literature information on children with learning and/or emotional problems was gained. However, the discrepancies in terminology hampered the gathering of meaningful and pertinent information.

For example, terms such as "emotionally disturbed," "cerebral dysfunction," "brain damage," and "learning disabilities" have meant different things to different researchers. Researchers often found varying results on a population described by the same nomenclature. This discrepancy is related to research design,[1] but it is also related to the rather ambiguous use of the terminology in this field.

The report to the National Institute of Neurological Disease and

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[1]Fred N. Kerlinger, Foundations of Behavior Research (San Francisco: Holt, Rinehart and Winton, Inc., 1964), pp. 3-50.

Blindness, Minimal Brain Dysfunction Terminology and Identification, explores the multitude of terms used to describe children showing signs of neurological impairment. Thirty-eight terms referring to minimal brain dysfunction were found and were grouped into the following two categories:

1. Organic aspects (e.g., "Organic Brain Disease," "Minor Brain Damage," "Choreiform Syndrome"), and,
2. Segments of behavior or consequences due to minimal brain dysfunction (e.g., "Hyperkinetic Behavior Syndrome," "Psychoneurological Learning Disorder," "Hypokinetic Syndrome," and "Learning Disabilities").[2]

In summary the report stated, "With few exceptions, the most striking omission through the literature was the lack of attempt at a definition of the terms used or the condition discussed. Although there is more than ample supply of terminology and characteristics, there is a shortage of interpretative elucidation."[3] This confusion creates a problem in achieving a reliable survey of the literature.

Within the limitations of terminology, an attempt will be made to present a profile of the educationally handicapped child to describe the child's behavioral characteristics, and to relate this to the three main parameters of the study:

1. academic achievement,
2. creativity, and

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[2]U. S. Department of Health, Education, and Welfare, Minimal Brain Dysfunction in Children: Terminology and Identification, 1966 (Washington, D.C.: Government Printing Office, 1966), p. 9.

[3]Ibid., pp. 9-10.

3. locus of control.

This study will focus on the actual school population of students in learning disability groups and special day classes, as defined by the California Educational Code. This legal definition provides the structure for the admission of a student to special educational programs. For further elaboration, the reader is referred to Appendixes A and B which give the educational and administrative codes related to educationally handicapped minors in California.

BEHAVIORAL DESCRIPTION

The neurologically impaired child appears to have varying degrees of the following traits: (1) erratic and inappropriate behavior upon mild provocation, (2) increased motor activity disappropriate to the stimulus, (3) poor organization of behavior, (4) distractibility of more than ordinary degree under ordinary conditions, (5) persistent hyperactivity,[4,5] and (6) perseveration.[6]

This is best summarized by Strauss and Lehtinen who stated, "All of these children show evidence of general disturbance in the classroom

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[4]Godfrey D. Stevens and Jack W. Birch, "A Proposal for Clarification of the Terminology used to describe Brain-Injured Children," in Educating Children with Learning Disabilities: Selected Reading, ed. by Edward C. Frierson and Walter B. Barbe (New York: Appleton-Century-Croft, 1967), pp. 88-89.

[5]H. Carl Haywood, ed., Brain Damage in School Age Children (Washington: Council for Exceptional Children, NEA, 1968), p. 5.

[6]Alfred A. Strauss and Laura E. Lehtinen, Psychopathology and Education of the Brain-Injured Child (New York: Grune and Stratton, 1947, pp. 169-170.

situation: distractibility, hyperactivity, and disinhibition as expressed in difficulty in conforming to the usual standard of group and classroom management."[7]

However, not all research would indicate that serious behavioral problems are evident in all learning disability students who show signs of being neurologically impaired. Myklebust and Boshes[8] found that learning disability groups did not differ from their normal control groups when tested with the IPAT Children's Personality Questionnaire, an instrument which yields an anxiety score. They found the same results with a group they labeled as being a borderline learning group. Using the Vineland Social Maturity Scale, Myklebust and Boshes found a difference in social maturity for both groups. They felt that not all learning disability students have emotional problems. Perhaps the difference between the conclusions of this research project and that of others lies in the definition of "emotional problems".

In most studies, emotional or behavioral problems are defined in terms of classroom behavior; thus, a child may have a normal anxiety score but still be a severely hyperactive child.

One of the best descriptions of behavior of emotionally disturbed students was compiled by Morse, et. al., in a survey of 100 public school programs for the emotionally handicapped.[9] The author gave the following

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[7]Ibid., pp. 169-170.

[8]U. S. Department of Health, Education and Welfare, Minimal Brain Damage in Children, pp. 18, 109-110.

[9]Morse, et. al., Public School Classes for Emotionally Disturbed, pp. 42, 43, 52, 76.

list as the most frequently occurring types of behavior (in decreasing order):

easily upset
short attention span
teases
fearful
disorganized in work
angers easily
defiant of authority
restless

In a table linking behavior problems and their causes as seen by teachers, "needs assurance," "poor self image," "needs affection," "fears rejection," "insufficient control at home," "rejection by parents," "inadequate intellect," and "wants recognition" were mentioned. In the same survey teachers of emotionally handicapped students felt that initial problems with their special classes included, control-management, hostile-aggressive behavior, academic-motivation, intra-group conflict, under-achievement, hyperactivity, wide individual differences, withdrawn children, and perceptual problems. Only 11 per cent of the teachers either reported no initial problems or failed to provide data.[10]

Of the entire population, 22 per cent were internalizing neurotics[11] and 38 per cent were externalizing neurotics.[12] Three per cent of the population had symbolic problems such as dyslexia, orientation difficulty, or problems with symbolization. Another 3 per cent were identified

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[10] Ibid., p. 52.

[11] Depression, withdrawal, obsessions, phobias, psycho-physiological reactions, etc., Ibid., pp. 38-39.

[12] Acting out, counteraggression, negative oppositional attitude, etc., Ibid.

having motor involvement.[13] Less than 12 per cent were classified neurologically impaired.[14]

The emotionally disturbed student and the learning disability group student have several common behavioral traits, and some differences. The apparent similarities are hyperactivity, emotional lability, perseveration, excitability, impulsivity, hyper-motor activity, and disorganized behavior, and the differences are that the emotionally disturbed children appear to be more "acting out" or "aggressive" in nature.

The literature thus surveyed does not lead to predictions based on the IAR which is the behavioral instrument used in this study. The available information on learning disability or neurologically impaired students does not indicate whether the child looks to himself or to others for his standards of behavior. The literature dealing with emotionally disturbed students indicated that the population is comprised both of internalizing and externalizing people. The following describes the educationally handicapped population (including brain-damaged children and children with behavior problems) in addition to providing descriptive guidelines for separating the characteristics of the brain-damaged child from that of a child with behavioral problems:

> Generally, the E.H. appears to have the following characteristics: He is not a happy child, He is more often easily enraged, as evidenced by fits of anger on slight provocation. He is frequently depressed in appearance. He seldom smiles or jokes with others. In many cases, he is energetic and active to such a degree that he is not able to

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[13]Perservation, overaction to stimulation, etc., Ibid.

[14]Ibid., pp. 39-41.

control his actions. He is very restless, and unable to remain quiet very long. He is extremely sensitive. His feelings are easily hurt over real and, also, imaginary affronts. He often feels persecuted, and frequently expresses the idea that he is being singled out for punishment. He cannot avoid "misbehaving," though repeatedly warned and punished for the same infraction on numerous occasions. He is often hostile to authority and does not respond well to any kind of authority or direction. He is very indecisive and has a hard time making up his mind on relatively minor choices. He is distractible, hyperactive, has motor disinhibition, occasional dissociation, lack of differentiation between figure and background, generalized disturbance, some degree of perseveration and inadequate self-image concept. He does not respond well to any kind of authority or direction.

Certain characteristics of behavior are manifested by the brain-injured child (minimal cerebral dysfunction) which can be considered generic to this type of organic damage. In varying degrees of severity, the following behavior patterns are displayed: Lack of inhibition and control in both motor and emotional function areas; disturbances of perception (the process in which meanings are attributed to the sensed stimuli), prolonged retention of primitive patterns, delay or difficulty in the acquisition of new functions and abilities, predisposition to anxiety (due to impaired organization), confused interpretation of the environment, early postural reflex disturbance, secondary psychological defense mechanisms generally related to repeated frustrations and anxiety.

An emotionally handicapped child is one who appears to have difficulty in coping with problems of living and development in areas where the majority of his peers can manage successfully. The disturbed child fails to achieve mastery in significant areas of life. Obvious manifestations may very well be affect disorders, temper outbursts, withdrawal, inappropriate social techniques, autism, tics, stammering, restlessness, sleep disturbance, incontinuence, rigidity, and driveness. Most frequently, the adaptive failures in the school situation are (1) learning inhibitions, (2) social maladaption, (3) school aversion or phobia, (4) marked differential between ability and achievement, and (5) truancy and stubbornness."[15]

This clearly indicates that the child with brain damage and the

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[15]Eugenia Kintzels and William Axilrod, A Program Handbook of Secondary Classes for the Educationally Handicapped (La Mesa: Grossmont Union High School District, 1966-67), p. 4.

child who is emotionally handicapped may have traits in common. For example, both types of children may have learning problems, social maladaption, and a discrepancy between apparent ability and academic success. In fact, a child may be both brain damaged and emotionally disturbed. Since the educationally handicapped population as defined in Chapter I includes individuals who are neurologically impaired or have behavioral problems, it is only natural that they would have traits which are described under the terms "brain-damaged" and "emotionally disturbed."

Tables 2 and 3 provide summaries of the common research findings, relevant to the behavioral characteristics of educationally handicapped children and serve as an introduction to the next section dealing with their learning deficits.

TABLE II

LIST OF LEARNING AND BEHAVIORAL TRAITS COMMON TO LEARNING DISABILITY STUDENTS

1. Perceptual-motor impairment
   a. fine and gross motor handicap
   b. difficulty in judging time, space, and distance
2. Memory and thinking
3. Reading handicap
   a. Syllabication
4. Spelling
5. Arithmetic
6. Speech and hearing
7. Understanding directions
8. Behavioral traits
   a. hyperactivity
   b. poor organization of behavior
   c. distractibility
   d. perseveration
   e. lacking in social maturity
   f. hypoactivity

The traits listed are generalities and apply to the group as a whole. Students in learning disability groups and special day classes will vary in the kind and degree of behavioral and academic deficits.

TABLE III

LIST OF BEHAVIORAL TRAITS AND LEARNING DEFICITS COMMON TO STUDENTS IN SPECIAL DAY CLASSES FOR EDUCATIONALLY HANDICAPPED MINORS

1. Reading
2. Arithmetic
3. Speech
4. Behavioral traits
   a. Faulty self-concept
   b. Easily upset
   c. Short attention span
   d. Fearful
   e. Disorganized in work
   f. Defiant of authority
   g. Angers easily
   h. Restless

ACADEMIC ACHIEVEMENT

One of the basic premises of this study is that students in learning disability groups and students in special day classes differ in degree, not in the type of learning problems. Since the students may demonstrate neurological impairments and/or emotional problems, the literature in the areas of neurologically handicapped and emotionally disturbed will apply to both groups. This study will attempt to identify the degree of differences and similarities.

The neurologically impaired student has several academic deficits

with perceptual motor impairment being frequently mentioned in the literature. After reviewing over 100 publications, Clements indicated that one of the ten most recurring characteristics was perceptual motor impairment.[16]

Perceptual motor deficit means that the student will have difficulties in all areas that require the coordination of sight and motor responses. Strauss and Lehtinen mention that any manual activity, such as cutting and coloring, will be affected.[17]

Disorders of memory and thinking are other commonly listed characteristics.[18] The results of having a poor memory are fairly evident. One example of this is the inability to memorize the multiplication tables.

The consequences of poor perceptual and conceptual abilities is not so obvious. The two are related, and, as stated by Fouracre, "if the perceptual ability of a brain-injured child is inferior, it is likely that his conceptual ability is also inferior."[19] This means, with an inferior perceptual-conceptual ability, the child will not be able "to relate percepts and interpret them in the usual normal way."[20]

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[16]Ibid., p. 9.

[17]Strauss and Lehtinen, Brain-Injured Child (New York: Grune and Stratton, 1947), p. 127, 173.

[18]U. S. Department of Health, Education and Welfare, "Minimal Brain Dysfunction" pp. 8-13.

[19]Maurice H. Fouracre, "Learning Characteristics of Brain-Injured Children," Exceptional Children, XXIV (January, 1958), 211.

[20]Ibid., p. 211.

If a student has faulty perceptual-conceptual ability, it would be difficult to learn modern mathematics because of the emphasis on the structure (concepts) of a mathematical model. Reading comprehension would also be difficult because of the inability to conceptualize what has been perceived.

The literature dealing with emotionally disturbed students directs itself basically toward behavioral problems and less toward the academic area. The available literature indicates that a very small percentage suffer from perceptual disabilities. Morse and his associates found that only about 4 per cent of the population surveyed could be classified as having a perceptual learning problem, and only 3 per cent were found to have motor impairment.[21] Therefore, it is reasonable to assume that perceptual or motor problems of students in special programs for the educationally handicapped can be related to neurological rather than emotional problems.

Faulty concept formation is often related to self-concept and in general to the interpretation of social situations.[22] This in turn affects the students' academic work, but this problem is related more to the secondary emotional deficit rather than to the primary perceptual-conceptual impairment.

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[21]William C. Morse, Richard L. Cutler, and Albert H. Fink, Public School Classes for the Emotionally Handicapped: A Research Analysis (Washington Council for Exceptional Children, 1964), pp. 3, 28-33.

[22]Eli Bower, The Education of Emotionally Handicapped Children (California State Department of Education, 1961), pp. 14, 24.

Perceptual-conceptual deficits and motor coordination problems are global terms that do not describe specific learning problems. The research conducted with the neurologically impaired indicated that reading, arithmetic, writing, and spelling are four specific areas which are troublesome. In addition, most researchers list speech and hearing problems as characteristic of these students.[23]

Johnson and Myklebust state that the learning disability students often "have deficits in acquiring the spoken word, in learning to read, to use written language, to spell, to tell time, to judge distance, size, length, and height or to calculate . . . ."[24]

An extensive study sponsored by the U. S. Department of Health, Education, and Welfare indicated that the learning disability group differed from a normal control group at the .01 level of significance on 47 variables. Variables relative to this research are oral vocabulary, syllabication, reading comprehension, spelling, understanding directions, and arithmetic. Furthermore, 12 WISC scores were found significantly different from the normative group.

The above applies to neurologically impaired students, but how does the emotionally disturbed student perform in specific academic areas? There is a scarcity of specific data concerning emotionally disturbed

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[23]U. S. Department of Health, Education and Welfare, "Minimal Brain Dysfunction," p. 13.

[24]Doris J. Johnson and Helmer R. Myklebust, Learning Disabilities (New York, N.Y.: Grune & Stratton, 1967), pp. 13, 25.

students and their academic achievement. However, reading and arithmetic are problem areas, with the reading problem being the more severe.[25,26] Speech difficulties have also been linked to emotionally disturbed students.[27] The major learning problems found in the neurologically impaired and emotionally disturbed would seem to be reading, arithmetic and speech. The neurologically impaired student appears to have deficits in perceptual and conceptual abilities as well as perceptual-motor coordination.

CREATIVITY

As a starting point in the evaluation of children's creativity, Torrance's definition is cited:

> A process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on: identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results.[28]

One might add that the creative person brings into play his past experiences but does not let these limit him.

With respect to the traits and personality factors of creative persons, two main opposing views have been expressed. One view holds that internal conflict is necessary for the creative process while the opposing

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[25]Morse, et al., Public School Classes for Emotionally Disturbed, pp. 33-35, 43.

[26]Frank Hewett, The Emotionally Disturbed Child in the Classroom (Boston: Allyn and Bacon, Inc., 1968), pp. 310-311.

[27]Bowers, Emotionally Handicapped, p. 14.

[28]Paul Torrance, Torrance Tests of Creative Thinking: Norms-Technical Manual (Princeton: Personnel Press, 1966), p. 6.

view states that the person must be open to himself and free from personal conflict if he is to be creative.

The Freudian theory relates "higher cultural achievements" with the concept of displacement. If a desired object is made inaccessible by internal or external barriers, a new object is chosen, thus reducing tension. Creativity is a displacement process which reduces or avoids tension. Hence, those individuals who have a propensity for tension have the greatest chance of being creative. The tense person, who (according to psychoanalytical theory), is to some degree mentally ill, has the best chance of being creative.[29]

Using the Freudian concept of creativity, John Rowan Wilson and his associates presented paintings by mentally ill artists. They showed a correlation between the degree of psychosis and the creative response. As the artists' mental health deteriorated their paintings became more bizarre and showed greater signs of originality. The pictures created by Vincent Van Gogh perhaps are the best example that the authors charted.[30]

Maria Constanca Calmon Villas-Boas summarized the Freudian point of view by writing, "It would appear that a basic assumption underlying the theories which conceptualize creativity as a result of displacement of pyschic energy, is that creativity is the product of neurotic conflict.

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[29]Calvin S. Hall, and Gardner Lindzey, "Freud's Theory of Personality," in Personalities and Cultures, ed. by Robert Hunt (New York: The Natural History Press, 1967), pp. 20-22.

[30]John Rowan Wilson, and others, The Mind (New York: Time Incorporate, 1964), pp. 136-151.

Such a view stresses the role played by unconscious processes in the creative process."[31]

Others feel that the creative process can take place only when the person is free of neurotic conflict. A creative person must be open to new ideas and experiences, "the ability to toy with elements and concepts," and have an internal locus of control ("The value of his product is for the creative person, established not by the praise or criticism of others, but by himself."[32] It is this ability to toy with elements and concepts that allows the creative person to "play spontaneously with ideas, colors, shapes and relationships" and mold them into new and creative products.[33] In addition to being able to tolerate ambiguity, the creative person has a great fund of energy which often results from a high degree of psychological health; furthermore, the creative person has the ability to constrict his interest and attention.[34]

Creative children are often seen as different by their teachers, and in general are perceived as being more wild, more difficult to know, more playful, less hard-working, and less desirable as students.[35] The following is a more elaborate listing of traits of creative children:

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[31]M. C. C. Villas-Boas, "A Study of the Motivational Role of Self-Concept and Locus of Control in Creative Children" (Unpublished Ph. D. dissertation, University of California, Berkeley, 1967), p. 3.

[32]Carl R. Rogers, On Becoming a Person (Boston: Houghton Mifflin, 1961), pp. 353-354.

[33]Ibid., pp. 354-355.

[34]G. D. Demos, J. C. Gowan, and E. P. Torrance, ed., Creativity: Its Educational Implications (New York: John Wiley & Sons, 1967), pp. 4-5.

[35]E. Paul Torrance, Rewarding Creative Behavior: Experiment in Classroom Creativity (Englewood Cliffs, Prentice-Hall, 1965), p. 274.

1. They have "a reputation for producing wild or silly ideas." This is especially true for boys.
2. "Their drawings and other productions are characterized by originality.---Their ideas simply do not conform to the standardized dimensions, the behavior norms on which responses are evaluated." (This is offered, by Torrance, as an explanation why many creative children do not do better on traditional intelligence tests.)
3. "Their productions are characterized by humor, playfulness, and relative relaxation."[36]

The educationally handicapped student shows some of the above signs of creativity in that he does not conform to normal standards. However, he seems to lack the sense of humor which is characteristically commensurate with the other traits. Perhaps the field of creativity offers a possible avenue to teach the educationally handicapped, since it offers many paths leading to a solution. Such activities as divergent sorting of figural objects (objects are sorted according to different qualities such as color, size and shape) are useful in teaching educationally handicapped students because there are several correct answers. Hence, "for educationally, neurologically, and emotionally handicapped children, this kind of a classification task may also be used to improve self-concept as well as to teach better discrimination. Here the student can feel safe, for his way is a correct way."[37]

In this research, creativity will be measured using the Torrance Test of Creative Thinking. This test is based on Guildord's model of intellect. It measures four separate areas which comprise creativity.

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[36]Paul Torrance, Creativity, Dimension in Early Learning Series (San Rafael: Dimension Publishing Co., 1969), p. 15.

[37]Mary N. Meeker, The Structure of Intellect: Its Interpretations and Uses (Ohio: Charles E. Merrill Publisher, 1969), p. 88.

They are fluency, flexibility, originality, and elaboration. The definition of creativity as presented in the first chapter defines these terms, but for further clarification their definitions are given again. Fluency is the ability to give several responses. For example, if a child was asked to name several animals, he would be considered to be fluent if he gave several responses. He would be flexible if he could name several animals of different categories; for example, dogs, pigs, and so on. If he just mentioned "dogs" but not several other animals, he would be fluent but not flexible. The child is considered original if he can give responses that are unusual for his age. Using the same example, the child would have to name animals not usually known by children his age. The last trait, elaboration, would be exhibited by a child if he could give details on the animals mentioned.[38, 39]

Torrance draws a relationship between two of his test variables and personality traits using the theoretical framework of Gestalt Psychology. He feels that people who give original responses are able to control their tension and delay the impulse to bring closure to a task.[40] With respect to elaboration he states, "high elaborators are characterized by their anxiety over not being able to meet what they perceive as high expectations of them by others."[41]

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[38]Torrance, Non-Technical Manual, p. 11.

[39]J. P. Guilford, Intelligence, Creativity and Their Educational Implications (San Diego: Robert R. Knapp, 1968), pp. 98-104.

[40]Torrance, Non-Technical Manual, p. 14.

[41]Ibid., p. 15.

For a child to be creative, it appears there has to be some sort of native intelligence, but the exact relationship between intelligence and tests of creativity has not been clearly demonstrated.[42, 43] Guilford states:

> Operationally, then, intelligence has been the ability (or complex of abilities) to master reading and arithmetic and similar subjects. The subjects are not conspicuously demanding of creative talent.[44]

A general pattern seems to be a substantial positive correlation between intelligence and creativity. Furthermore,

> When the whole range of IQ is included, say for 62 to 150, there is a characteristic scatter plot. This plot shows that when the IQ is low, scores on tests of creative potential can only be low. When the IQ is high, there can be a wide range in performance on creative tasks.[45]

In summary, it appears that children in special day classes for educationally handicapped minors and students in learning disability groups may or may not be creative. If the Freudian view is used to postulate hypotheses then the children in special day classes would be more creative than children in learning disability groups since these children show a higher level of emotional lability. Both groups would show greater signs of creativity than the normal school population. On the other hand, if the Rogerian view is used to form hypotheses, the children in special day classes for educationally handicapped minors would

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[42] Ibid., pp. 82-83.

[43] J. P. Guilford, The Nature of Human Intelligence (San Francisco: McGraw Hill, 1967), pp. 167-170.

[44] Guilford, Creativity, p. 83.

[45] Ibid., p. 143.

be less creative than children in learning disability groups because they would be less open to their experiences and in general less emotionally sound. Likewise, both groups would be less creative than the regular school population. This study surveys the educationally handicapped children with an open mind to both theories and letting the results speak for themselves.

With respect to intelligence, there seems to be a need for a certain level before the creative process can take place. Furthermore, the possession of a high IQ does not guarantee creativity but rather intelligence seems to be a necessary but not a sufficient condition for it.

LOCUS OF CONTROL

> When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics we have termed this a belief in internal control.[46]

Julian B. Rotter has stated that people who have an internal locus of control are more resistant to change from the outside, and hence, resist conscious external manipulation. However, "if the internally oriented person perceives that it is to his advantage to conform, he may do so

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[46]Julian B. Rotter, "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs: General and Applied, 80 (Whole No. 609, 1966), 1.

consciously and willingly without yielding any of his control.[47] He linked internals (those individuals with an internal locus of control) with those individuals striving for academic achievement. Since people with an external locus of control look to the outside world, they are less resistant to change.[48]

Individuals who score high on either scale (external or internal), according to Rotter, are essentially unrealistic and maladjusted by most definitions. In particular, extreme scores in externality connote maladjustment. These extreme scores show a curvilinear relationship to ego control.[49] He listed the following traits of people who have an internal locus of control:

1. More alert to those aspects of the environment which provide useful information for his future behavior;
2. take steps to improve his environmental conditions;
3. place greater value on skill or achievement reinforcements and be generally more concerned with his ability, particularly his failures;
4. be resistive to subtle attempts to influence him.[50]

The concept of locus of control has been linked to different social behavior, such as feeling powerless (a dimension of alienation), learning performance, and to more or less achievement-related activities.[51, 52]

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[48]Ibid.

[49]Ibid., pp. 4, 17.

[50]Ibid., p. 25.

[51]Herbert M. Lefcourt, "Internal Versus External Control of Reinforcement: A Review," Psychological Bulletin, 65 (No. 4, 1966), 206.

[52]Melvin Seaman, On the Meaning of Alienation, Bobbs-Merrill Reprint Series in the Social Sciences (Indianapolis: Bobbs-Merrill, 1959), p. 785.

Some relationship between creativity and locus of control has been found. There seems to be a relationship between locus of control with respect to self concept and creativity if intelligence is also considered.[53] This seems to be a rather complex, interaction effect.

A positive correlation between locus of control and the ability to discriminate imbedded figures has been demonstrated. The individual who takes responsibility for his "own intellectual success and failure, especially if they accept blame for the negative consequences of their own behavior, makes fewer errors in the identifying the figures than do children who blame others for their negative reinforcement." They also report that the higher the children scored on the internal scale, the greater was their efficiency in doing a series of difficult tasks.[54] This could be one possible reason why some of the educationally handicapped students have difficulty in figure-foreground relationships and in doing a series of hard assignments.

The literature only gives hints of what can be expected on the locus of control test when considering learning disability students and students in special day classes. It could be postulated that these students will score lower on the IAR test, thus indicating less willingness to take blame or credit for their academic pursuits.

The parameter of locus of control is important to the study of EH

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[53]Villas-Boas, "Locus of Control," pp. 14, 60-61.

[54]Virginia Crandall, and others. National Institute of Mental Health Progress Report, Jan. 1, 1963-Dec. 31, 1965, pp. 111, 113.

children. This position is supported by James, who states:

> 1. The categorization of situations as being externally or internally controlled is a basic variable in human learning theory. differentially affecting a number of learning functions. Future application of learning theory especially to complex human behavior should consider the affect of this variable.
> 2. The generalized extent to which individuals categorize situations as being internally or externally controlled is a significant personality characteristic, which has predictive utility in relation to other specific behavior of individuals.[55]

Crandall, et. al., agree with James when they state,

> Many situations in the laboratory or in nature, contain cues defining the degree to which reinforcements are contingent on the subject's instrumental acts. Similarly, individuals have been found to differ in the degree to which they believe that they are usually able to influence the outcome of the situation. They may believe that their actions produce the reinforcements which follow their efforts, or they may feel that reward and punishment meted out to them are at the discretion of powerful others or are in the hands of luck or fate. In fact, the same reinforcement in the same situation may be perceived by one individual as within his own control and by another as outside his influence. These personal beliefs could be important determiners of the reinforcing effects of many experiences. If, for example, the individual is convinced that he has little control over the rewards and punishments he receives, then he has little reason to modify his behavior in an attempt to alter the probability that those events will occur. Rewards and punishments, then, will have lost most of their reinforcing value, since they will not be effective in strengthening or weakening the S's responses. . . .
>
> Recent studies suggest that reinforcement - responsibility beliefs hold promise of being predictive of individual differences in reinforcements sensititivity, in attitudes, and in social behavior.[56]

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[55]W. H. James, "Internal Versus External Control as a Basic Variable in Learning Theory" (unpublished Ph. D. dissertation, Ohio State University, 1957), p. 87.

[56]Virginia C. Crandall, Walter Katkovsky, and Vaughn J. Crandall, "Children's Beliefs in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, XXXVI (March, 1965), 91-92.

In short, locus of control has been shown to have a relationship to academic achievement and is linked to behavior, two of the important areas relating to learning disability and special day class students.

SUMMARY

The literature indicates that the terminology applied to students who have learning deficits and/or emotional problems is not well defined or clearly used.

The summary of literature indicates that both learning disability students and students with emotional problems have serious reading disorders. Furthermore, these students usually have some deficits in arithmetic and speech.

The learning disability students also have deficits in their perceptual-conceptual process, motor coordination, and hearing.

Behaviorally, learning disability group students show signs of hyperactivity or hypoactivity, poor organization of behavior, distractibility, perseveration, and social immaturity.

The students in special day classes are often classified as having faulty self-concepts and a short attention span. They are also excitable, fearful, disorganized, defiant, restless, and easily angered.

The literature also indicates that the locus of control for the learning disability students and the students in special day classes will probably be more externally directed. This suggests that these students do not take responsibility for their academic successes or failures.

In reviewing creativity, the literature denotes that there are

opposing views as related to personality. The Freudian view holds that a conflict is necessary whereas the Rogerians feel that the individual must be free of conflict to be creative. The educationally handicapped students show signs of creativity such as establishing their own standards, yet, they lack other qualities, for example, a sense of humor. The literature shows a paucity of research dealing specifically with these children and creativity.

The following chapter will present the research design of this study. Furthermore, a detailed description of the population will be given. Each test will be discussed and appropriate hypotheses formulated.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

In this chapter a description of the population used in this study will be given. Furthermore, the instruments used to measure the three main variables of academic achievement, locus of control, and creativity, will be discussed. The four instruments used in this study are the Stanford Diagnostic Reading Test; Stanford Diagnostic Arithmetic Test; Intellectual Achievement Responsibility Questionnaire (IAR Questionnaire); and the Torrance Test of Creative Thinking-Figural "A". Hypotheses will be given for each test and/or subtest.

The following numbering system will be used in labeling the hypotheses. The capital letter indicates the test: A- Torrance Test of Creativity; B- Stanford Diagnostic Reading Test; C- Stanford Diagnostic Arithmetic Test; D-Locus of Control Test. The numerical number indicates the subtest used, such as flexibility, reading comprehension, and others. The lower case letters indicate the two educational categories when they are used in normative comparisons; "a" indicates learning disability group while "b" indicates special day class. This format will be used throughout this paper.

POPULATION

The random sample was comprised of third and fourth grade students who were registered in programs for the educationally handicapped as of September 4, 1970 in the Napa Valley Unified School District.

The parents of this initially randomly selected group were sent letters requesting their written permission to include their child in this study (See Appendix C, page 148). A total of sixty letters were sent. The letter also contained a questionnaire asking for the head of the household's occupation and educational level. This information was used to determine the socio-economic-status of the child. Parents who did not respond to the first letter were sent a second letter. In this second letter the researcher stated that he would assume he had their permission to test their child if he did not hear from them either by letter or telephone (see Appendix D, page 149). If the parents refused to have their child in the study, a telephone call was made assuring the parents their wishes would be respected, even though the researcher would still like to include their child in the study. The parent's wishes were final, and, if after the telephone call they still refused, the child was not included. Only three parents refused their permission for their children to be in the study.

Of the fifty-seven educationally handicapped students polled, forty were used in the study and the remaining seventeen were designated as alternates. Six alternates were chosen to replace students who were not included in the study because they were no longer in a special educational program, had moved to another school district, or were not allowed in the study by their parents. All testing was done on this final group of forty educationally handicapped students.

The students were separated by educational classifications; that is, learning disability group or special day class students. They were also

assigned to one of the two IQ groupings.[1] The median for the entire group in addition to both educational category was determined.[2] The medians were used in determining the two IQ bands.[3]

The separation by educational categories and IQ of the forty students resulted in the placement of ten students in each of the four following cells: A) upper IQ-learning disability group student; B) lower IQ-learning disability group student; C) upper IQ-special day class student; and D) lower IQ-special day class student.

DEMOGRAPHIC INFORMATION

Socio-economic Level

Havinghurst's two factor analysis, amount of education and type of occupation, was used in determining the socio-economic status of the students in the study.[4,5] He used a rating scale of five, with Class I

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[1]Intelligence was chosen as the other independent variable because of its correlation with the three parameters of this study-achievement testing, creativity, and locus of control. The reader is referred to Chapter II which indicates the positive correlation between achievement test scores and intelligence scores. Chapter II also shows a relation between intelligence and creativity. This chapter as well as Chapter II provides information linking locus of control with standard intelligence test scores.

[2]The median for the learning disability group students, special day class students, and total population are respectively 97, 95, and 97.

[3]The dividing IQ was determined to be 97. All scores above 97 were considered in the high intelligence group while those below it were considered to belong to the low intelligence group.

[4]August B. Hollingshead, Two Factor Index of Social Position (New Haven, Connecticut: By author, 1965 Yale Station, 1957), pp. 2-11.

[5]August B. Hollingshead and Frederick C. Hedlich, Social Class and Mental Illness (New York: John Wiley and Sons, 1958), pp. 398-407.

being the upper level and Class V the lowest level.[6] The data from this survey can only be taken as an approximation to the actual socio-economic level because what was then only twenty-five of the forty questionnaires containing this information were returned. Nevertheless, the following results were found: A) learning disability - low intelligence group Class IV (90% return); B) learning disability group - high intelligence Class IV (50% return); C) special day class students - low intelligence Class IV (70% return); and D) special class students - high intelligence Class IV (40% return).

The results may indicate that educationally handicapped students tend to come from the fourth class, or from the lower socio-economic levels. A word of caution should be issued to the reader. Since this data was not compared to a control group of regular students in the Napa area, the findings may not be unique to this educationally handicapped population. Information from the Chamber of Commerce would indicate a high concentration of people registering in the fourth class due to the concentration of heavy industry, such as the Federal Government shipyard, Kaiser Steel, Napa State Hospital, and the wine industry.[7] Therefore the general socio-economic status of the people in this area may be fourth class. However, it seems peculiar that out of this randomly selected population that only one person was from another class (Class Level II).

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[6]Hollingshead, Two Factor Index, pp. 2-11.

[7]Hall and Goodhue, The General Plan for the City of Napa (adopted by the City of Napa on November 12, 1968), (Monterey, California, 1969), p. 43.

With respect to bilingualism, not more than 5% of the surveyed population spoke more than one language.

Intelligence

The median IQ of the forty students selected was 97, with a range of 77 to 115. The median IQ for the learning disability group and the special day class students was respectively 97 (range 83 to 115) and 95 (range 77 to 107). All of the intelligence scores were taken from the students' files and represent individually obtained intelligence scores. Ninety per cent of the scores were taken from WISC profiles, and the remaining 10 per cent were from the Stanford-Binet. When the IQ was reported to be in the average range, a score of 100 was assigned for the purpose of this study. This happened in three cases or for 7.5 per cent of the total population.

For the four categories designated in this study; the following data was obtained for IQ medians and range.

a. Learning disability group - low intelligence: 88.5, range from 83 to 97.

b. Learning disability group - high intelligence: 106, range from 99 to 115.

c. Special day class student - low intelligence: 86, range 77 to 91.

d. Special day class student - high intelligence: 102.5, range 98 to 107.

Sex and Age

The majority of the students in the educationally handicapped group studied were males. There were only five females, which represented 12.5 per cent of the total population. The learning disability group were 90 per cent males while the special day class student population consisted of 85 per cent males. Using the four categories of this study the following data were obtained:

a. Learning disability group - low intelligence: 80 per cent males
b. Learning disability group - high intelligence: 100 per cent males
c. Special day class students - low intelligence: 90 per cent males
d. Special day class students - high intelligence: 80 per cent males.

The mean age for the educationally handicapped population was nine years and eight months, with a range of eight years and eight months to eleven years of age. For the total learning disability group, the mean age was nine years and eight months, with a range of eight years and ten months to eleven years of age. The mean age for the entire special day class students was nine years and eight months, with a range of eight years and eight months to ten years and ten months of age. Using the four categories of this study, the following data were gathered concerning age means and age range:

a. Learning disability group - low intelligence: a mean of nine years and eight months; range from eight years ten months to ten years nine months.

b. Learning disability group - high intelligence: mean of nine years eight months; range from eight years ten months to eleven years.

c. Special day class student - low intelligence: mean of nine years six months; range from eight years eight months to ten years nine months.

d. Special day class student - high intelligence: mean of nine years ten months; range from nine years three months to ten years six months.[8]

RESEARCH DESIGN

Testing

As designated earlier in this chapter, four main categories were investigated A) learning disability group - low intelligence, B) learning disability group - high intelligence, C) special day class - low intelligence, and D) special day class - high intelligence. This makes a 2 x 2 analysis of variance possible with ten students in each cell. (See Table IV.) The F-test will be applied to each of the variables listed under the three parameters; (creativity, academic achievement, and locus of control).[9] (See Table V.)

When using the F-tests the following levels of significance will be used:

1. .01 for scientifically significant

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[8]All ages were computed as of September 1, 1970.

[9]James L. Bruning and B. L. Kintz, Computational Handbook of Statistics (Glenview, Ill.: Scott, Foreman and Co., 1968), pp. 25-30.

TABLE IV

ANALYSIS OF VARIANCE DESIGN FOR EACH OF THE TWENTY-ONE VARIABLES

	LDG	SDC
High IQ	10[a]	10[a]
Low IQ	10[a]	10[a]

a) Number of students in each cell.

TABLE V

A LISTING OF VARIABLES AND THEIR COMPONENTS USED TO SURVEY STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

I. CREATIVITY	II. ACADEMIC ACHIEVEMENT		III. LOCUS OF CONTROL
	A. Reading	B. Arithmetic	
1. Fluency	5. Reading Comprehension	12. Number System	19. I+
2. Flexibility	6. Vocabulary	13. Operations	20. I-
3. Originality	7. Auditory Discrimination	14. Decimals Place Value	21. I (total)
4. Elaboration	8. Syllabication	15. Addition	
	9. Beginning and ending sounds	16. Subtraction	
	10. Blending	17. Concepts (Total)	
	11. Sound Discrimination	18. Computation (Total)	

2. .05 for administrative decisions[10]

3. .20 worthy of replication[11]

In addition, the two educational categories of learning disability groups and special day class students will be compared to the groups used by the authors of each test to standardize their tests.[12] For creativity, a T score differing five or more points from the norm will be considered significant.[13] In the area of academic achievement a stanine score differing more than one from the norm is considered statistically significant.[14] A two-tailed t-test will be used to compare the scores of the locus of control test to (1) the scores of the total population upon which the test was standardized, and (2) the norms that were derived for males.[15] The .01 level of significance was chosen to indicate significance for all normative comparison to assure a high level of confidence (See Table VI); however, data will be given in parentheses at the .05 or .20 level of

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[10]This level of significance is considered important for all decisions involving programs for these children.

[11]If a replicated study also gives a .20 level of significance on a given factor this would indicate a significant level of .04 or better. (Ref. William Feller, An Introduction to Probability Theory and its Applications (New York: John Wiley and Sons, 1957), pp. 118-121.).

[12]See Appendixes E, F. G., pages 150,153,155 for information concerning normative data.

[13]Using the two tail t-test with the size of this population, a T score variance of five points is significant at the .01 level.

[14]A deviation of one stanine of a population of the size is significant at the .01 level.

[15]This Normative data was provided by the IAR research staff upon request of the researcher.

confidence; these levels are reported to indicate a possible relationship and to suggest future research.

TABLE VI

FORMAT FOR STANDARD SCORE REPORTING ("T" AND STANINE SCORES)

	Mean of experimental group	Mean of Norms	Difference	Significance
LDG	*	*	*	*
SDC	*	*	*	*

Collection of Data

The data was collected during the 1970-71 school year. The academic achievement scores were collected at the beginning of the school year, whereas the locus of control and creativity data was taken at mid-year. The Stanford Diagnostic Tests were given as part of the standard evaluating procedure for educationally handicapped classes in the Napa Valley Unified School District. These tests were given in groups by the special Learning Disability Group teacher or the teacher of the Special Day Class. In a few cases the test was administered to individuals who were absent at the regular testing time. All other tests were given individually to the students by the researcher. The Torrance Test of Creativity was given using the standard procedures described in the test manual.

A variance was made with respect to the Intellectual Responsibility Questionnaire. Children are usually given this test in the form of recorded statements because of the reading level of these young students.

Instead of taping the questionnaire, the researcher read the questions and all possible answers to the students, and then marked their answer sheets.

All intelligence scores were taken from the files of the students: these scores were individually obtained and none were over two years old. The socio-economic data was collected from November through March.

EVALUATIVE INSTRUMENTS

The four tests used to evaluate creativity, academic achievement, and locus of control will be discussed in this section. They are:

a. Torrance Test of Creativity, figural form - thinking creatively with pictures, booklet A
b. Stanford Diagnostic Reading Test
c. Stanford Diagnostic Arithmetic Test
d. Intellectual Achievement Responsibility Questionnaire.

The description of each test with its corresponding hypotheses will be discussed next.

A. Torrance Tests of Creative Thinking - Figural A

The figural test of creativity is part of a larger battery which also includes a verbal section. Learning disability students and students in special day classes are in these special programs partly or totally because of a marked learning disorder. The researcher felt that the learning problems would markedly affect the results of a verbal creativity test, and thus the results would be confounded. Thus, the tester would not be sure if the test measured the children's lack of verbal ability or their creativity. Hence, a nonverbal test of creativity was chosen;

therefore, creativity was limited to figural forms but can be extrapolated to represent creativity in general.

This figural test of creativity (subtitled "Thinking Creatively with Figures - Booklet A")[16] has three sections, Picture Completion Test, Incomplete Figural Activity, and Repeated Figural Activity (Lines). In the first of these tests, Picture Completion, the examinee is asked to draw a picture using a colored pear shaped piece of paper as a part of his total drawing. He is asked to draw a picture that no one else will think of (measures originality). The examinee is also asked "to add ideas that will make the picture tell as complete and as interesting a story as possible." This allows the subject to elaborate.[17]

The Incomplete Figural Activity consists of ten incomplete figures. The subject is asked to complete these figures by sketching some interesting object or picture. He is to think of an original picture and to add ideas to his first response that will make it as interesting and as complete a story as possible. This section yields scores in flexibility, originality, and elaboration.[18]

The final test, Lines, consists of thirty parallel lines. The student is told to draw unusual pictures, to make as many different pictures as possible, and to add to each picture as many ideas as he is able.

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[16]E. Paul Torrance, Torrance Tests of Creative Thinking: Direction Manual and Scoring Guide (Princeton: Personnel Press, 1966), p. 3.

[17]E. Paul Torrance, Torrance Tests of Creative Thinking: Norms-Technical Manual (Princeton: Personnel Press, 1966), p. 14-15.

[18]Torrance, Direction Manual, p. 9.

"Theoretically, the . . . parallel lines elicit the creative tendency to bring structure and completeness to whatever is incomplete . . . ."[19] This test requires the four divergent abilities of fluency, flexibility, originality, and elaboration. Thus

> This triad of activities represents three different aspects of creativity or three different tendencies. The Incomplete Figures Activity call into play the tendency toward structuring and integrating. The Incomplete figures create tension in the beholder who must control his tension long enough to make the mental leap necessary to get away from the obvious and commonplace. . . The repetition of a single stimulus in the . . . Parallel Lines Activity requires an ability to return to the same stimulus again and again and perceive it in a different way. The Picture Construction Activity sets in motion the tendency toward finding a purpose for something that has no definite purpose and to elaborate it in such a way that the purpose is achieved. . . .[20]

> The complexity of the three figural tasks is varied through the instructions. In the first task, the primary motivation is for originality or unusualness and the secondary motivation is for elaboration, "adding ideas to tell a more complete and exciting story." In the second task, flexibility or variety of type of response is added to originality and elaboration, and fluency is a minor consideration. In the third task, fluency enters to compete with originality, elaboration, and flexibility.[21]

Torrance reports correlation coefficient from a low of .66 to a high of .99 for the figural forms with respect to interscorer reliability of teachers for fluency, flexibility, originality and elaboration.[22] He claims the reliability coefficient could be raised if the tester would familiarize

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[19]Torrance, Norms-Technical Manual, p. 15.

[20]Ibid., pp. 15-16.

[21]Ibid., p. 16.

[22]Torrance gave further training to test scorers who fall below .90 correlation with experienced scorers. All Tests of Creativity given in this study were evaluated by Torrance's staff.

himself with the rationale of the test and carefully read the scoring guide.[23]

The following ranges of Test-retest reliability coefficients were reported by Torrance for elementary and secondary school students.[24]

1. Figural Fluency .50 - .80
2. Figural Flexibility .63 - .73
3. Figural Originality .60 - .85
4. Figural Elaboration .71 - .83

Torrance claims construct validity for his test and cites many studies to verify this.[25] The present study will not add to the validation of his test but will use the test to describe the population of this study.

Hypotheses: Creativity

The following hypotheses apply to the special day class students and students in learning disability groups when using the Torrance Test of Creative Thinking - Figural A.

A - 1. There will be a significant difference in Fluency between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking - Figural A.

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[23] Ibid., p. 18.

[24] Ibid., p. 19.

[25] Ibid., pp. 23-56.

A - 1a. Learning disability students as a group will score in Fluency significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 1b. Students in special day classes for the educationally handicapped will score in Fluency significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 2. There will be a significant difference in Flexibility between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking - Figural A.

A - 2a. Learning disability students as a group will score in Flexibility significantly different from the normative population measured by the Torrance Test of Creative Thinking - Figural A.

A - 2b. Students in special day classes for the educationally handicapped will score in Flexibility significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 3. There will be a significant difference in Originality between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking - Figural A.

A - 3a. Learning disability students as a group will score in Originality significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 3b. Students in special day classes for the educationally handicapped will score in Originality significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 4. There will be a significant difference in Elaboration between students in learning disability groups and students in special classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking - Figural A.

A - 4b. Learning disability students as a group will score in Elaboration significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 4b. Students in special day classes for the educationally handicapped will score in Elaboration significantly different from the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

B. Stanford Diagnostic Reading Test

The Level I diagnostic battery was designed for the normal population in grades 2.5 to 4.5. Seven sections are related to the reading process: (1) Reading Comprehension (2) Vocabulary (3) Auditory Discrimination (4) Syllabication (5) Beginning and Ending Sounds (6) Blending, and (7) Sound Discrimination. Individual raw scores may be converted into stanines. The Reading Comprehension raw score can also be converted into a grade score. For each subsection pertinent information from the Manual for Administrating and Interpreting the Stanford Diagnostic Reading Test will be

discussed.[26]

1. Reading Comprehension: This first test "is a test of paragraph comprehension. It is included to provide an evaluation of this particular skill, as well as a base line from which to judge the remaining subtests."[27]

2. Vocabulary: This is a test of oral vocabulary. The student is given a word in a sentence. He is then asked to identify one of three words which has the same meaning. Auditory vocabulary is important because students in their initial stages of reading "recognize words (in print) whose meaning they already know."[28]

3. Auditory Discrimination: This section "assesses the pupils ability to perceive and discriminate aurally by detecting similarities and differences among the phonemes of the English language." This skill is a prerequisite to learning to read, and it is imperative that it be evaluated for pupils whose general reading level is below grade 3."[29]

4. Syllabication: This test examines "the pupil's ability to divide words into syllables." The test designers felt that even though this test only measures the student's ability to indicate the initial syllable of a word, it is of value because major syllabication rules can be evaluated in this manner.[30]

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[26]Bjorn Karlsen, Richard Madden, and Eric F. Gardner, Manual for Administering and Interpreting the Stanford Diagnostic Reading Test: Level I (New York: Harcourt, Brace & World, 1966), pp. 17-20, 28-30.

[27]Ibid., p. 18.

[28]Ibid.

[29]Ibid., pp. 18-19.

[30]Ibid.

5. Beginning and Ending Sounds: "Test 5 has two parts, beginning sounds and ending sounds, both of which assess the ability to pair some of the more common spellings and phonemes of the English language. Included in this test are recognition of sounds represented by single letters, two- or three consonant letters, and diagraphs."[31]

6. Blending: "Test 6 evaluates the third phase of the word analysis process /units must be blended into proper words/ . . . . After the pupil has determined the appropriate separation of a given word and has read each unit he needs to blend the units." At this level (grades 2.5 to 4.5) the word is pronounced for the student and he then marks his booklet for what he believes is the appropriate response.[32]

7. Sound Discrimination: "Test 7 assesses the pupil's knowledge of common and variant spellings of the sounds of the English language. The test no doubt has a considerable auditory component and pupils with limited skills in auditory perception of sounds will do poorly on the test. . . . The task required of a pupil is to hold in mind an auditory image designated in one word and to find this same sound in one of three words. Inasmuch as the sound may be spelled in different ways, the test measures sound qualities rather than letter similarities. The unique value of the test lies in its ability to measure the skill of relating sounds which are produced from the printed words."[33]

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[31] Ibid., pp. 19-20.

[32] Ibid.

[33] Ibid.

The Stanford Diagnostic reading subtests have a reliability coefficient varying from .73 (Syllibication) to .95 (Reading Comprehension). The authors claim concurrent validity but also say that this factor depends on its use. The construct validity varies from .49 (Word Meaning) to .72 (Vocabulary) when compared to the Stanford Achievement Test.[34]

Hypotheses: Academic - Reading

The following is a list of hypotheses which are generated through the use of this test.

B - 1. There will be a significant difference in Reading Comprehension scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured on the Stanford Diagnostic Reading Test.

B - 1a. Learning disability students as a group will score in Reading Comprehension significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 1b. Students in special day classes for the educationally handicapped will score in Reading Comprehension significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 2. There will be a significant difference in Vocabulary scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford

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[34] Ibid., pp. 28-30.

Diagnostic Reading Test.

B - 2a. Learning disability students as a group will score in Vocabulary significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 2b. Students in special day classes for the educationally handicapped will score in Vocabulary significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 3. There will be a significant difference in Auditory Discrimination scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 3a. Learning disability students as a group will score in Auditory Discrimination significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 3b. Students in special day classes for the educationally handicapped will score in Auditory Discrimination significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 4. There will be a significant difference in Syllabication scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 4a. Learning disability students as a group will score in Syllabication significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 4b. Students in special day classes for the educationally handicapped will score in Syllabication significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 5. There will be a significant difference in Beginning and Ending Sounds scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 5a. Learning disability students as a group will score in Beginning and Ending Sounds significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 5b. Students in special day classes for the educationally handicapped will score in Beginning and Ending Sounds significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 6. There will be a significant difference in Blending scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 6a. Learning disability students as a group will score in Blending significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 6b. Students in special day classes for the educationally handicapped will score in Blending significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

B - 7. There will be a significant difference in Sound Discrimina-

tion scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 7a. Learning disability students as a group will score in Sound Discrimination significantly different from the normative population measured by the Stanford Diagnostic Reading Test.

B - 7b. Students in special day classes for the educationally handicapped will score in Sound Discrimination significantly different from the normative population as measured by the Stanford Diagnostic Reading Test.

Stanford Diagnostic Arithmetic Test

The Stanford Diagnostic Arithmetic Tests consist of three main parts - Concepts, Computations, and Number Facts. This latter section was not included in this study for two reasons, (1) the test designer did not determine norms for this section, and (2) the section on computation overlaps number facts (number fact questions are asked orally whereas the computation questions are presented in printed form). The information in this paragraph and the following ones is taken from the Manual for Administering and Interpreting the Stanford Diagnostic Reading Test - Level I.[35]

The concept section has three subtests. They are titled "The Number System and Counting," "Operations," and "Decimal Place Value." The

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[35]Leslie S. Beatty, Richard Madden, and Eric F. Gardner, Manual for Administering and Interpreting the Stanford Diagnostic Arithmetic Test: Level I (New York: Harcourt, Brace & World, 1966), pp. 18-32, 34-35.

first of these, the number and counting test, examines the student's ability to use a number line, to count by groups of two, five, or ten, to place numbers in a series. In addition other concepts of counting and the number system are measured. The test on operations concerns itself with the commutative property of multiplication and addition (e.g., 3·4 = 4·3; 3+4 = 4+3); the associative property of multiplication and addition ($3/\overline{4\cdot 5}/ = /\overline{3\cdot 4}/5$; $/\overline{3+4}/+5 = 3+/\overline{4\div 5}/$) the distributive property ($3/\overline{4+5}/ = /\overline{3\cdot 4}/ + /\overline{3\cdot 5}/$); inverse operations (e.g., if 2+3 = 5 then 5-3 = 2; if 3 x 6 = 18 then 18 ÷ 6 = 3); identity element for addition (1 + 0 = 1), identity element for multiplication (3·1 = 3); and finally, number sentences (2 + 5 = 7). The last section under concepts is used to test the student's knowledge in decimal place value. In other words, this part of the test checks on the student's ability and understanding of the base ten number system. For example, the student is asked what does the "3" stand for in the number 8314. Furthermore, the student is tested on his ability to use the ten symbols (0 to 9) in the base ten system.

The sum from the three tests under concepts total is used to determine a total concept score. This score and the individual section scores will be used in this study. The raw scores will be converted into stanine scores thus allowing a comparison of the learning disability students with students in special day classes for educationally handicapped minors and then a comparison of each of them with the general school population.

The Computation section consists of four separate tests - Addition,

Subtraction, Multiplication, and Division. The latter two tests will not be used because third graders are not expected to be proficient in these areas.

The addition subtest examines the student's ability to add two, three, and four column numbers, to carry, to position and add numbers given in a horizontal position (e.g., 12 + 14 + 44 to $\begin{array}{r} 12 \\ 14 \\ \underline{44} \end{array}$).

The subtraction test evaluates the student's ability to subtract with and without borrowing and the use of zero as a place holder.

The addition and the subtraction scores are used individually and are summed to give a total score for computation. These raw scores will be converted to stanine scores so that both the special day students and the learning disability students can be compared to the general third and fourth grade population, and to each other.

The reliability of the subtest used from the Stanford Diagnostic Arithmetic Test varies from 179 (addition) to .97 (total score of addition plus subtraction). The construct validity depends on the use of the test and will vary accordingly hence, data is not offered by the test authors. The test was correlated with the Stanford Achievement Test, using the Arithmetic subtest. The correlation coefficient varied from .38 (comparing addition to arithmetic computation on the SAT) to .84 (comparing concepts total to arithmetic concepts on the SAT).[36]

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[36]Ibid., pp. 34-35.

Hypotheses: Academic Arithmetic

The following is a list of hypotheses related to the Stanford Diagnostic Arithmetic Test:

C - 1. There will be a significant difference in Number System and Counting scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 1a. Learning disability students as a group will score in Number Systems and Counting significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 1b. Students in special day classes for the educationally handicapped will score in Number Systems and Counting significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 2. There will be a significant difference in Operation scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 2a. Learning disability students as a group will score in Operations significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 2b. Students in special day classes for the educationally handicapped will score in Operations significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 3. There will be a significant difference in Decimal Place Value scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 3a. Learning disability students as a group will score in Operations significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 3b. Students in special day classes for the educationally handicapped will score in Operations significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 4. There will be a significant difference in Addition scores between learning disability students and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 4b. Learning disability students as a group will score in Addition significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 4b. Students in special day classes for the educationally handicapped will score in Addition significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 5. There will be a significant difference in Subtraction scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 5a. Learning disability students as a group will score in Subtraction significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 5b. Students in special day classes for the educationally handicapped will score in Subtraction significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 6. There will be a significant difference in Concepts Total scores between students in learning disability group students and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 6a. Learning disability students as a group will score in Concepts Total significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 6b. Students in special day classes for the educationally handicapped will score in Concepts Total significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 7. There will be a significant difference in Computation Total scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

C - 7a. Learning disability students as a group will score in Computation Total significantly different from the normative population measured by the Stanford Diagnostic Arithmetic Test.

C - 7b. Students in special day classes for the educationally handicapped will score in Computation Total significantly different from the normative population as measured by the Stanford Diagnostic Arithmetic Test.

D. Intellectual Achievement Responsibility Scale

> The IAR Questionnaire provides two subscale scores and a total score. The I+ subscale measures the child's tendency to see himself as responsible for the positive reinforcements he receives in intellectual-academic situations; the I- subscale measures his tendency to see himself as responsible for his negative reinforcements or failures in such situations, while the total I score, the sum of the subscores, measures the child's general acceptance of responsiblity for the outcome of his achievement efforts. A high score on each of these scales represents internal responsiblity, a low score, external responsibility.[37]

Succinctly stated, the Intellectual Achievement Responsibility Scale measures the student's ability to assume responsibility for his academic successes and failures.

This test originally consisted of thirty-four items. A short form was constructed by eliminating non-discriminating items. Two such short forms were designed: one for children in the 3rd, 4th, and 5th grades and one for children in grades 6, 8, 10, and 12. Both of these forms have twenty items (ten I+ and ten I- questions). Since this study deals with children in the 3rd and 4th grades the short form for the younger children was chosen.

The short form for younger children correlates well with the long

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[37]Daniel Solomon, Kevin A. Houlihan, and Robert J. Parelius, "Intellectual Achievement Responsibility in Negro and White Children." Psychological Reports, 24 (1969), p. 480.

form --- .90 and .91 for I+ and I- items respectively. The authors of this test claim that the short form increases the construct validity by eliminating questions which lead to social desirability response tendencies (taking credit for successes and blaming others for failures.)[38]

The long form was standardized on 923 elementary and high school students. Of this total population 304 students were from the 3rd, 4th, or 5th grades. The research on this population indicated a moderate correlation with IQ and socio-economic level. For the younger group the total I and I- scores "were predicted by their IQ scores." An analysis of variance indicated that socio-economic status and the interaction of SES and IQ were significantly correlated with I+ scores of younger children. "Thus, the effects of social class and intelligence, while weak, seem to indicate that intelligence is more often the stronger of the two predictors to internality. In both cases where interaction occurred, t tests revealed that the effect of the two factors are additive, rather than forming a complex interaction."[39]

Hypotheses: Locus of Control

The use of the IAR Questionnaire allows three hypotheses to be tested. One for each scale score --- I+, I-, and I total. These hypotheses are:

D - 1. There will be a significant difference in the ability to

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[38]Virginia Crandall, et al., National Institute of Mental Health Health Progress Report, Dec., 1968, pp. 60-65 and Table 2.

[39]Virginia C. Crandall, Walter Katkovsky, and Vaughn J. Crandall, "Children Beliefs in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, 36 (March, 1965), pp. 97, 103-105.

take credit for academic successes between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the I+ Scale of the IAR Questionnaire.

D - 1a. There will be a significant difference in the ability to take credit for one's academic successes between learning disability students and the normative population as measured by the I+ Scale of the IAR Questionnaire.

D - 1b. There will be a significant difference in the ability to take credit for one's academic successes between students in special day classes for the educationally handicapped minors and the normative population as measured by the I+ Scale of the IAR Questionnaire.

D - 2. There will be a significant difference in the ability to accept responsiblity for academic failures between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the I- Scale of the IAR Questionnaire.

D - 2a. There will be a significant difference in the ability to accept responsibility for one's academic failures between learning disability students and the normative population as measured by the I- Scale of the IAR Questionnaire.

D - 2b. There will be a significant difference in the ability to accept responsibility for one's academic failures between students in special day classes for the educationally handicapped minors and the normative population as measured by the I- Scale of the IAR Questionnaire.

D - 3. There will be a significant difference in the general ability to accept responsiblity for both academic successes and failures between

students in learning disability groups and students in special day classes for the educationally handicapped as measured by the I Total Scale of the IAR Questionnaire.

D - 3a. There will be a significant difference in the general ability to accept responsibility for both academic successes and failures between students in learning disability groups and the normative population as measured by the I Total Scale of the IAR Questionnaire.

D - 3b. There will be a significant difference in the general ability to accept responsibility for both academic successes and failures between students in special day classes for the educationally handicapped minors and the normative population as measured by the I Total Scale of the IAR Questionnaire.

Summary

This chapter has presented the research design and the hypotheses that will be tested. The levels of confidence for accepting the hypotheses were established. Furthermore, a description of each evaluating instrument and their subsections was given.

Chapter IV will present the findings of this study.

CHAPTER IV

ANALYSIS OF DATA

In Chapter III a description of the evaluating instruments was given and a set of hypotheses for each subsection was formulated. The foregoing hypotheses will be stated in the null form within the contents of this chapter. The numbering of each hypotheses will follow the same system as used in the preceding chapter.

Tables will be provided listing the data under the appropriate sections. Each section will deal with one of the specific factors, and within each of these sections a short evaluation of the data will be made. At the conclusion of this chapter a summary of significant variables will be presented.

PRESENTATION OF DATA

A. Torrance Test of Creativity

A - 1. Hypothesis: Fluency. There will be no significant difference in fluency between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Torrance Test for Creative Thinking - Figural A.

A - 1a. There will be no significant difference in the Fluency scores between the learning disability students and the normative population as measured by the Torrance Test of Creative Thinking - Figural A.

A - 1b. There will be no significant difference in the Fluency

scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Torrance Test for Creative Thinking - Figural A.

Table VII indicates that the null hypothesis was accepted. In this study there is no significant difference between learning disability students and students in special day classes with respect to fluency as it applies to creativity.

TABLE VII

ANALYSIS OF VARIANCE FOR FLUENCY SCORES ON THE TORRANCE TESTS OF CREATIVE THINKING - FIGURAL A BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MF	F	P
Total	7988.00	39	204.82		
IQ	72.90	1	72.90	.343	N.S.
E.C.*	193.60	1	193.60	.910	N.S.
IQ x EC*	62.50	1	62.50	.294	N.S.
Error	7659.00	36	212.75		

*E.C. refers to educational classification of the student. This includes both learning disability students and students in special day classes for educationally handicapped minors.

The data also indicates that intelligence and the interaction of intelligence and educational classification was not statistically significant (IQ x EC interaction).

Table VIII indicates that the learning disability group (LDG)

differs from the norms at the .01 level or better. This suggests that the LDG is more fluent than the normative population. The data on the special day class students (SDC) fails to indicate a significant difference from the normative population at the .01 level. This would indicate that learning disability students (LDG), but not special day students, are more able to produce varied responses related to a task.

TABLE VIII

T-TEST USING "T" SCORES FOR FLUENCY SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean Scores	Norm Means	Difference	P
LDG	57.700	50.000	+ 7.700	.01
SDC	53.300	50.000	+ 3.300	(.20)[a]

A) Scores in paranthesis are not considered by the researcher as statistically significant for normative data.

Flexibility

The hypotheses for flexibility are:

A - 2. There will be no significant difference in Flexibility between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Thinking Creatively with Pictures Test.

A - 2a. There will be no significant difference in the Flexibility scores between the learning disability students and the normative population as measured by the Torrance Test of Creative Thinking.

A - 2b. There will be no significant difference in the Flexibility scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Torrance Test of Creative Thinking.

Table IX indicates that the two educational groups do differ at a .05 level of significance. Intelligence and its interaction with educational classification is not significant.

TABLE IX

ANALYSIS OF VARIANCE FOR FLEXIBILITY SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	4236.40	39	108.63		
IQ	4.90	1	4.90	.048	N.S.
E.C.	435.60	1	435.60	4.225	.05
IQ x EC	84.10	1	84.10	.816	N.S.
Error	3711.80	36	103.11		

TABLE X

T-TEST USING "T" SCORES FOR FLEXIBILITY SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Total Scores	Norm Mean	Difference	P
LDG	52.100	50.000	+ 2.100	(.20)
SDC	45.500	50.000	- 4.500	(.05)

The null hypotheses stating there would be no difference in the flexibility scores between either group and the normative population was accepted. Both groups failed at the .01 level of confidence. See Table X.

Originality

The three following hypotheses were tested:

A - 3. There will be no significant difference in Originality between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking.

A - 3a. There will be no significant difference in the Originality scores between the learning disability students and the normative population as measured by the Torrance Test of Creative Thinking.

A - 3b. There will be no significant difference in the Originality scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Torrance Test of Creative Thinking.

The data in Table XI indicates that the null hypothesis that there are no differences in flexibility between learning disability students and students in special day classes must be accepted. The interaction between intelligence and educational classification is not significant.

When the two educational groups were compared to the normative population a significant difference was found for both groups. That is, both groups seem to be more original in their responses, see Table XII.

TABLE XI

ANALYSIS OF VARIANCE FOR ORIGINALITY SCORES ON THE TORRANCE TESTS OF CREATIVE THINKING - FIGURAL A BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	17,090.98	39	459.23		
IQ	308.03	1	308.03	.652	N.S.
E.C.	140.63	1	140.63	.298	N.S.
IQ x EC	455.62	1	455.62	.965	N.S.
Error	17,005.70	36	972.38		

TABLE XII

T-TEST USING "T" SCORES FOR ORIGINALITY SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean Scores	Norm Means	Difference	P
LDG	73.350	50.000	+ 23.350	.01
SDC	69.600	50.000	+ 19.600	.01

Elaboration

The hypotheses for Elaboration are:

A - 4. There will be no significant difference in Elaboration between students in learning disability groups and students in special classes for educationally handicapped minors as measured by the Torrance Test of Creative Thinking.

A - 4b. There will be no significant difference in the Elaboration scores between the learning disability students and the normative population as measured by the Torrance Test of Creative Thinking.

A - 4b. There will be no significant difference in the Elaboration scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Torrance Test of Creative Thinking.

Table XIII indicates that a distinction cannot be made with respect to elaboration between the learning disability students and students in special day classes. Therefore, the null hypothesis is accepted. There is no indication that interaction between intelligence and type of educational classification had any significance.

Table XIV indicates that both the learning disability students and the students in special day classes scored significantly below the normative population thus indicating that they are limited in the ability to elaborate.

B. Stanford Diagnostic Reading Test

Reading Comprehension. The hypotheses for Reading Comprehension are:

TABLE XIII

ANALYSIS OF VARIANCE FOR ELABORATION SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	5020.78	39	128.74		
IQ	511.23	1	511.23	4.083	.20
E.C.	2.03	1	2.03	.016	N.S.
IQ x EC	0.23	1	0.23	.002	N.S.
Error	4507.30	36	125.20		

TABLE XIV

T-TEST USING "T" SCORES FOR ELABORATION SCORES ON THE TORRANCE TEST OF CREATIVE THINKING - FIGURAL A BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean Scores	Norm Means	Difference	P
LDG	41.700	50.000	- 8.300	.01
SDC	42.150	50.000	- 7.850	.01

B - 1. There will be no significant difference in Reading Comprehension scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured on the Stanford Diagnostic Reading Test.

B - 1a. There will be no significant difference in the Reading Comprehension scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Reading Test.

B - 1b. There will be no significant difference in the Reading Comprehension scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

The data in Table XV suggests that there is no significant difference between the two educational groups and the null hypothesis is accepted. Intelligence taken by itself is a significant factor but its interaction with the educational classification is not.

Both the learning disability group and the students in special day classes scored significantly below the norming group. (See Table XVI). This would tend to indicate that both of these groups have serious problems in reading comprehension.

Vocabulary

The null hypotheses for vocabulary are:

B - 2. There will be no significant difference in Vocabulary scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

TABLE XV

ANALYSIS OF VARIANCE FOR READING COMPREHENSION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	38.00	39	0.97		
IQ	4.90	1	4.90	5.478	.05
E.C.	.90	1	.90	1.006	N.S.
IQ x EC	.00	1	.00	.000	N.S.
Error	32.20	36	.89		

TABLE XVI

T-TEST USING "T" SCORES FOR READING COMPREHENSION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	1.350	5.000	- 3.650	.01
SDC	1.650	5.000	- 3.350	.01

B - 2a. There will be no significant difference in the Vocabulary scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Reading Test.

B - 2b. There will be no significant difference in the Vocabulary scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

The analysis of variance shows that there is no significant difference between the learning disability students and students placed in special day classes. (Table XVII.) The null hypothesis is therefore accepted. Both intelligence and the interaction of intelligence and the educational classification are not significant.

The students in learning disability groups as well as the students placed in special day classes differed significantly from the normative population as seen in Table XVIII. Since the scores were below the norm, it would indicate that the students in both of these educational groups are significantly behind in vocabulary development.

Auditory Discrimination

The following hypotheses were tested:

B - 3. There will be no significant difference in Auditory Discrimination scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 3a. There will be no significant difference in the Auditory Discrimination scores between the learning disability students and the

TABLE XVII

ANALYSIS OF VARIANCE FOR VOCABULARY SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	162.78	39	4.17		
IQ	4.23	1	4.23	.978	N.S.
E.C.	3.03	1	3.03	.700	N.S.
IQ x EC	.03	1	.03	.006	N.S.
Error	155.50	36	4.32		

TABLE XVIII

T-TEST USING "T" SCORES FOR VOCABULARY SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Means	Difference	P
LDG	3.200	5.000	- 1.800	.01
SDC	2.650	5.000	- 2.350	.01

normative population as measured by the Stanford Diagnostic Reading Test.

B - 3b. There will be no significant difference in the Auditory Discrimination scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

Examination of the analysis of variance, Table XIX, denotes that there is no statistical significance between students in learning disability groups and students in special day classes in auditory discrimination. Thus the null hypotheses is accepted. The only significant factor is intelligence as related to auditory discrimination. Interaction of intelligence and the educational groupings did not reach a significant level.

Both groups scored at the .01 level of confidence when compared to normative population on auditory discrimination scores as illustrated by the data in Table XX. These low scores are indicative of the student's inability to (1) discriminate between auditory sounds and (2) to relate them to their corresponding written symbols.

Syllabication

The hypotheses dealing with syllabication are:

B - 4. There will be no significant difference in Syllabication scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 4a. There will be no significant difference in the Syllabication scores between the learning disability students and the normative

TABLE XIX

ANALYSIS OF VARIANCE FOR AUDITORY DISCRIMINATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	184.78	39	4.74		
IQ	34.23	1	34.23	8.253	.01
E.C.	1.23	1	1.23	.295	N.S.
IQ x EC	.03	1	.03	.006	N.S.
Error	149.30	36	4.15		

TABLE XX

T-TEST USING "T" SCORES FOR AUDITORY DISCRIMINATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	3.250	5.000	- 1.750	.01
SDC	2.900	5.000	- 2.100	.01

population as measured by the Stanford Diagnostic Reading Test.

B - 4b. There will be no significant difference in the Syllabication scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

Table XXI indicates that not only was there no significance between the two educational groupings but that intelligence and its interaction with the educational classification were also not significant: hence, the null hypothesis was accepted.

Both groups scored below the mean stanine score which indicate a significant difference (Table XXII). Thus, these students do not have the skills for dividing words into syllables.

Beginning and Ending Sounds

The hypotheses for this section are:

B - 5. There will be no significant difference in Beginning and Ending Sounds scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 5a. There will be no significant difference in the Beginning and Ending Sounds scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Reading Test.

B - 5b. There will be no significant difference in the Beginning and Ending scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

TABLE XXI

ANALYSIS OF VARIANCE FOR SYLLABICATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	56.78	39	1.46		
IQ	1.23	1	1.23	.797	N.S.
E.C.	.03	1	.03	.016	N.S.
IQ x EC	.23	1	.23	.146	N.S.
Error	55.30	36	1.54		

TABLE XXII

T-TEST USING "T" SCORES FOR SYLLABICATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.100	5.000	-2.900	.01
SDC	2.050	5.000	-2.950	.01

Analysis of variance of the beginning and ending sound scores denotes that there is no significant difference between learning disability students and students in special day classes. However, intelligence is significant at the .20 level which would indicate further research is needed to obtain a higher confidence level. The interaction of intelligence with the educational categories showed no significant difference, (Table XXIII).

Both groups score sufficiently below the normative student scores yielding a .01 level of significance (Table XXIV). These low scores demonstrate that learning disability group students and students in special day classes are behind in their skills enabling them to recognize beginning and ending sounds.

Blending

The hypotheses relating to blending are:

B - 6. There will be no significant difference in Blending scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 6a. There will be no significant difference in the Blending scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Reading Test.

B - 6b. There will be no significant difference in the Blending scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

TABLE XXIII

ANALYSIS OF VARIANCE FOR BEGINNING AND ENDING SOUNDS SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	85.60	39	2.19		
IQ	6.40	1	6.40	2.969	.20
E.C.	1.60	1	1.60	.742	N.S.
IQ x EC	.00	1	.00	.000	N.S.
Error	77.60	36	2.16		

TABLE XXIV

T-TEST USING "T" SCORES FOR BEGINNING AND ENDING SOUNDS SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.600	5.000	- 2.400	.01
SDC	2.200	5.000	- 2.800	.01

Table XXV presents data which signifies there is no significant difference between learning disability group students and students placed in special day classes in their ability blending sounds to form words. Intelligence significantly related to blending at the .05 level. The interaction of intelligence and the educational classification is not significant.

Both educational groups scores sufficiently below the normative group to indicate a serious blending problem. Table XXVI shows this to be significant at the .01 level. This data suggest that these students are limited in their ability to blend the component part of words into whole words.

Sound Discrimination

The following are the hypotheses for sound discrimination:

B - 7. There will be no significant difference in Sound Discrimination scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

B - 7a. There will be no significant difference in the Sound Discrimination scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Reading Test.

B - 7b. There will be no significant difference in the Sound Discrimination scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Reading Test.

The data on sound discrimination (Table XXVII) purports a

TABLE XXV

ANALYSIS OF VARIANCE FOR BLENDING SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	69.38	39	1.78		
IQ	7.23	1	7.23	4.357	.05
E.C.	1.23	1	1.23	.739	N.S.
IQ x EC	1.23	1	1.23	.739	N.S.
Error	59.70	36	1.66		

TABLE XXVI

T-TEST USING "T" SCORES FOR BLENDING SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.500	5.000	- 2.450	.01
SDC	2.200	5.000	- 2.800	.01

significant difference between learning disability groups and students in special day classes at the .20 level of confidence. Thus, further research is recommended to clarify this issue. Intelligence and the interaction of intelligence with educational classification was not significant.

Both the learning disability group students and the students in special day classes scored below the norm and was significant at the .01 level of confidence. (See Table XXVIII.) The low scores obtained by these students suggest a deficient in the knowledge of the variants in the spelling of words.

C. Stanford Diagnostic Arithmetic Test

The Number System and Counting. The number system and counting test generated the following hypotheses:

C - 1. There will be no significant difference in Number System and Counting scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 1a. There will be no significant difference in the Number System and Counting scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 2a. There will be no significant difference in the Number System and Counting scores between the students in special day classes for the educationally handicapped and the normative population as measured by

TABLE XXVII

ANALYSIS OF VARIANCE FOR SOUND DISCRIMINATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	73.50	39	1.88		
IQ	.90	1	.90	.481	N.S.
E.C.	3.60	1	3.60	1.923	.20
IQ x EC	1.60	1	1.60	.855	N.S.
Error	67.40	36	1.87		

TABLE XXVIII

T-TEST USING "T" SCORES FOR SOUND DISCRIMINATION SCORES ON THE STANFORD DIAGNOSTIC READING TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.550	5.000	- 2.450	.01
SDC	1.950	5.000	- 3.050	.01

the Stanford Diagnostic Arithmetic Test.

The data in Table XXIX shows that both the educational classification and intelligence are significant factors at the .05 level of confidence. The interaction of these two factors is not significant.

Both the learning disability group students and the special day class students score below the norm. Their scores (Table XXX), indicate a .01 significant level of difference from the normative population. These special education students are not familiar with the number system and its concepts as are average students in their grade.

Operations

The following are the hypotheses for this section.

C - 2. There will be no significant difference in Operation scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 2a. There will be no sifnificant difference in the Operation scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 2b. There will be no significant difference in the Operation scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

The null hypothesis was rejected at the .20 level of confidence indicating that further research is needed in this area. Since the null

TABLE XXIX

ANALYSIS OF VARIANCE FOR NUMBER SYSTEM AND COUNTING SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	102.98	39	2.64		
IQ	11.03	1	11.03	4.980	.05
E.C.	11.03	1	11.03	4.980	.05
IQ x EC	1.23	1	1.23	.553	N.S.
Error	79.70	36	2.21		

TABLE XXX

T-TEST USING "T" SCORES FOR NUMBER SYSTEMS AND COUNTING SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	3.300	5.000	- 1.700	.01
SDC	2.250	5.000	- 2.750	.01

hypothesis was rejected (Table XXXI) it appears that the students in learning disability groups and students in special day classes do differ in their ability to perform arithmetical operations. Intelligence was significant at the .05 level of confidence. The interaction of the two variables of intelligence and educational classification was not significant.

Both educational groups scored sufficiently below the norm to be significant at the .01 level. This would indicate that these groups have a serious learning deficit in the performance of arithmetical operations (Table XXXII).

Decimal Place Value

Decimal place value hypotheses are:

C - 3. There will be no significant difference in Decimal Place Value scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 3a. There will be no significant difference in the Decimal Place Value scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 3b. There will be no significant difference in the Decimal Place Value scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

TABLE XXXI

ANALYSIS OF VARIANCE FOR OPERATIONS SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	56.78	39	1.46		
IQ	5.63	1	5.63	4.263	.05
E.C.	3.03	1	3.03	2.293	.20
IQ x EC	.63	1	.63	.477	N.S.
Error	47.50	36	1.32		

TABLE XXXII

T-TEST USING "T" SCORES FOR OPERATIONS SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.600	5.000	- 2.400	.01
SDC	2.050	5.000	- 2.950	.01

The data in the analysis of variance, Table XXXIII, signifies that there is a significant difference at the .01 level of confidence between learning disability students and students in special day classes when measuring the ability to understand decimal value place concepts. The null hypothesis was rejected. Intelligence is significant but at the .05 level. Interaction of these two variables was not significant.

Both groups fall below the norms sufficiently to indicate that they are different from regular students at the .01 level of confidence. These stanine scores shown in Table XXXIV suggest that both learning disability group students and special day class students are below their educational counterparts in the ability to use the decimal place value concept.

Addition

The following hypotheses apply to addition:

C - 4. There will be no significant difference in Addition scores between learning disability students and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 4a. There will be no significant difference in the Addition scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 4b. There will be no significant difference in the Addition scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

TABLE XXXIII

ANALYSIS OF VARIANCE FOR DECIMAL PLACE VALUE SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	94.98	39	2.44		
IQ	9.03	1	9.03	4.622	.05
E.C.	15.63	1	15.63	8.001	.01
IQ x EC	.03	1	.03	.013	N.S.
Error	70.30	36	1.95		

TABLE XXXIV

T-TEST USING "T" SCORES FOR DECIMAL PLACE VALUE SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	3.600	5.000	- 1.400	.01
SDC	2.350	5.000	- 2.650	.01

The null hypothesis was rejected at the .01 level of confidence. Hence, the two educational categories do represent different population with respect to the ability to add. The factor of intelligence as well as the interaction of intelligence with the educational categories were not significant (Table XXXV).

The students in both the learning disability group and the special day classes differed at the .01 level from the normal population of elementary school students, Table XXXVI. Therefore, it seems that both these groups have deficits in their ability to do arithmetic addition.

Subtraction

The subtraction hypotheses are:

C - 5. There will be a significant difference in Subtraction scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 5a. There will be no significant difference in the Subtraction scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 5b. There will be no significant difference in the Subtraction scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

The null hypothesis was rejected but at the .20 level of confidence. Hence, there seems to be a difference in the ability to subtract between

TABLE XXXV

ANALYSIS OF VARIANCE FOR ADDITION SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	80.40	39	2.06		
IQ	.90	1	.90	.585	N.S.
E.C.	22.50	1	22.50	14.621	.01
IQ x EC	1.60	1	1.60	1.040	N.S.
Error	55.40	36	1.54		

TABLE XXXVI

T-TEST USING "T" SCORES FOR ADDITION SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	3.050	5.000	- 1.950	.01
SDC	1.550	5.000	- 3.450	.01

students in learning disability groups and students in special day classes, (Table XXXVII). Since the level of confidence is at the .20, further research is indicated. Neither intelligence nor the interaction of intelligence and educational classification is significant. Table XXXVIII shows that both educational grouping scored below the stanine level and therefore were significant at the .01 level. Thus these students were not as capable in subtraction as the average student.

Concepts Total for Number and Numerals

The following are hypotheses for Concept total:

C - 6. There will be no significant difference in Concepts total scores between students in learning disability group students and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Arithmetic Test.

C - 6a. There will be no significant difference in the Concepts total scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 6b. There will be no significant difference in the Concepts total scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

The analysis of variance shown in Table XXXIX indicates that the educational groupings were significantly different in their concept total scores at the .01 level of confidence. Therefore the null hypothesis was rejected. Intelligence was a significant factor at the .05 level of confidence. The interaction of the above two variables was not significant.

TABLE XXXVII

ANALYSIS OF VARIANCE FOR SUBTRACTION SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	95.98	39	2.46		
IQ	4.23	1	4.23	1.726	.20
E.C.	3.03	1	3.03	1.236	N.S.
IQ x EC	.63	1	.63	.255	N.S.
Error	88.10	36	2.45		

TABLE XXXVIII

T-TEST USING "T" SCORES FOR SUBTRACTION SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.800	5.000	- 2.200	.01
SDC	2.250	5.000	- 2.750	.01

Both learning disability students and students in special day classes scored below stanine four which indicates that they were significantly different from the normal population at the .01 level. This indicates that these students were below their peer group in their ability to understand the concepts of the base ten number system,Table XL.

Computation Total

The following hypotheses apply to Computation total.

C - 7. There will be no significant difference in Computation total scores between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the Stanford Diagnostic Reading Test.

C - 7a. There will be no significant difference in the Computation total scores between the learning disability students and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

C - 7b. There will be no significant difference in the Computation total scores between the students in special day classes for the educationally handicapped and the normative population as measured by the Stanford Diagnostic Arithmetic Test.

Educational classification seems to be a pertinent factor in the area of computation total. Table XLI indicates that the null hypothesis was rejected at the .05 level of confidence. Neither intelligence nor the interaction of intelligence with the two educational categories was significant.

Examination of Table XLII suggests that both educational groups were below the norms at the .01 level of confidence. Because of their low

TABLE XXXIX

ANALYSIS OF VARIANCE FOR CONCEPTS TOTAL SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	65.10	39	1.67		
IQ	8.10	1	8.10	6.258	.05
E.C.	10.00	1	10.00	7.725	.01
IQ x EC	.40	1	.40	.309	N.S.
Error	46.40	36	1.29		

TABLE XL

T-TEST USING "T" SCORES FOR CONCEPTS TOTAL SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Mean	Difference	P
LDG	2.850	5.000	2.150	.01
SDC	1.850	5.000	3.150	.01

TABLE XLI

ANALYSIS OF VARIANCE FOR COMPUTATION TOTAL SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	90.00	39	2.31		
IQ	1.60	1	1.60	.796	N.S.
E.C.	14.40	1	14.40	7.160	.05
IQ x EC	1.60	1	1.60	.796	N.S.
Error	72.40	36	2.01		

TABLE XLII

T-TEST USING "T" SCORES FOR COMPUTATION TOTAL SCORES ON THE STANFORD DIAGNOSTIC ARITHMETIC TEST BETWEEN THE NORMATIVE GROUP AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Scores	Norm Means	Difference	P
LDG	3.100	5.000	- 1.900	.01
SDC	1.900	5.000	- 3.100	.01

score in computation total, both educational groups show a deficiency in the ability to compute addition and subtraction.

Locus of Control

1. I+: Ability to take credit for one's academic successes:

The following hypotheses apply to this section.

D - 1. There will be no significant difference in the ability to take credit for one's academic successes between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the I+ scores of the IAR Questionnaire.

D - 1a. There will be no significant difference in the ability to take credit for one's academic successes between learning disability students and the normative population as measured by the I+ scale of the IAR Questionnaire.

D - 1b. There will be no significant difference in the ability to take credit for one's academic successes between students in special day classes for the educationally handicapped and the normative population as measured by the I+ scale of the IAR Questionnaire.

The data in Table XLIII indicates that there was no significant difference between learning disability students and students in special day classes for educationally handicapped minors in their ability to take credit for academic successes. Intelligence was a significant factor at the .05 level. The interaction effect was not significant.

Table XLIV shows that the t-test scores derived from the comparison of the learning disability group students to the norm for boys on this IAR

TABLE XLIII

ANALYSIS OF VARIANCE FOR I+ SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	159.90	39	4.10		
IQ	25.60	1	25.60	6.867	.05
E.C.	.00	1	.00	.000	N.S.
IQ x EC	.10	1	.10	.027	N.S.
Error	134.20	36	3.73		

TABLE XLIV

t-TEST USING "T" SCORES FOR I+ SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	5.950	7.24	19	4.52	.01
SDC	5.950	7.24	19	4.52	.01

TABLE XLV

t-TEST USING "T" SCORES FOR I+ SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS AND GIRLS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	5.950	7.32	19	3.41	.01
SDC	5.950	7.32	19	3.41	.01

Scale indicated a significant difference at the .01 level. The same was true for the students in special day classes. When the norms for boys and girls was used, the t-test indicated that learning disability students as well as students in special day classes for educationally handicapped minors differed significantly at the .01 level of significance. The scores of the learning disability students and the students in special day classes were below the norm for regular students, indicating that these students were less able to take credit for their academic successes than regular students (See Tables XLIV and XLV).

2. I-: Ability to take the responsibility for one's academic failures:

The following three hypotheses pertain to this section:

D - 2. There will be no significant difference in the ability to accept responsibility for one's academic failures between students in learning disability groups and students in special day classes for educationally handicapped minors as measured by the I- scale of the IAR Questionnaire.

D - 2a. There will be no significant difference in the ability to accept responsibility for one's academic failures between learning disability students and the normative population as measured by the I- scale of the IAR Questionnaire.

D - 2b. There will be no significant difference in the ability to accept responsibility for one's academic failures between students in special day classes for educationally handicapped minors and the normative

population as measured by the I- scale of the IAR Questionnaire.

The analysis of variance of the I- scale shown by Table XLVI indicated that learning disability students and students in special day classes do not differ. Neither intelligence nor the interaction of intelligence with the educational classifications were of statistical significance.

The t-test using the learning disability group and the norms for young boys showed a significance of .05. The special day class students and the norms for young males, indicates a t-score significant at the .20 level. Hence, further investigation is warranted. When the learning disability students were compared to the norm for both young boys and girls a significant level was obtained (.01). Using the special day class students and the norm which included both boys and girls a .20 level of significance was purported thus indicating a need for further research. Scores for both the learning disability group and special day class students fell below the norm at significant levels thus indicating that these students do not take the responsibility for academic failure as much as do regular students. (See Tables XLVII and XLVIII.)

3. I Total: The ability to take responsibility for both academic successes and academic failures:

The following three hypotheses apply to the I total scale:

D - 3. There will be no significant difference in the general ability to accept responsibility for both academic successes and failures between students in learning disability groups and students in special day

TABLE XLVI

ANALYSIS OF VARIANCE FOR I- SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE ARITHMETIC TEST BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	113.60	39	2.91		
IQ	.10	1	.10	.033	N.S.
E.C.	.40	1	.40	.130	N.S.
IQ x EC	2.50	1	2.50	.814	N.S.
Error	110.60	36	3.07		

TABLE XLVII

t-TEST USING "T" SCORES FOR I- SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	6.300	7.46	19	2.53	.05
SDC	6.500	7.46	19	2.05	.20

TABLE XLVIII

t-TEST USING "T" SCORES FOR I- SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS AND GIRLS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	6.300	7.32	19	2.54	(.05)
SDC	6.500	7.32	19	2.04	(.20)

classes for the educationally handicapped as measured by the I total scale of the IAR Questionnaire.

D - 3a. There will be no significant difference in the general ability to accept responsibility for both academic successes and failures between students in learning disability groups and the normative population measured by the I total scale of the IAR Questionnaire.

D - 3b. There will be no difference in the general ability to accept responsibility for academic successes and failures between students in special day classes for the educationally handicapped minors and the normative population as measured by the I total scale of the IAR Questionnaire.

The analysis of variance illustrated by Table XLIX, indicates that the educational classification was not significant for taking responsibility for academic successes and failures. Intelligence reached a significance at .20 level of confidence indicating that further research is needed. Interaction of educational classification and intelligence did not reach a significant level.

The t-test table for taking responsibility for academic successes and failures indicates a level of significance at the .01 level for all four combinations: (learning disability group students-norm for young boys, learning disability group students-norm for both young boys and girls, special day class students-norm for young boys, and special day class students-norm for both young boys and girls). Since the scores fall below the norm for regular students, these students do not assume responsibility for academic successes and failures as often as most elementary

TABLE XLIX

ANALYSIS OF VARIANCE FOR I TOTAL SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

Source	SS	DF	MS	F	P
Total	359.10	39	9.21		
IQ	28.90	1	28.90	3.170	.20
E.C.	.40	1	.40	.044	N.S.
IQ x EC	1.60	1	1.60	.176	N.S.
Error	328.20	36	9.12		

TABLE L

t-TEST USING "T" SCORES FOR I TOTAL SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	12.250	14.64	19	3.85	.01
SDC	12.450	14.64	19	3.53	.01

TABLE LI

t-TEST USING "T" SCORES FOR I TOTAL SCORES ON THE INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE BETWEEN THE NORMATIVE GROUP (YOUNG BOYS AND GIRLS) AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND SPECIAL DAY CLASS STUDENTS

Source	Test Mean	Norm Mean	DF	T-Test	P
LDG	12.250	14.64	19	3.46	.01
SDC	12.450	14.64	19	3.17	.01

TABLE LII

STATISTICAL LEVEL OF CONFIDENCE FOR EACH VARIABLE BETWEEN THE STUDENTS IN LEARNING DISABILITY GROUPS AND STUDENTS IN SPECIAL DAY CLASSES

VARIABLE	LEVEL OF SIGNIFICANCE
A. Creativity	
1. Fluency	N.S.
2. Flexibility	.05[a]
3. Originality	N.S.
4. Elaboration	N.S.
B. Stanford Diagnostic Reading Test - Level 1	
5. Reading Comprehension	N.S.
6. Vocabulary	N.S.
7. Auditory Discrimination	N.S.
8. Syllabication	N.S.
9. Beginning and Ending Sounds	N.S.
10. Blending	N.S.
11. Sound Discrimination	.20[a]
C. Stanford Diagnostic Arithmetic Test - Level 1	
12. Number System and Counting	.05[a]
13. Operations	.20[a]
14. Decimal Place Value	.01[a]
15. Addition	.01[a]
16. Subtraction	N.S.
17. Concepts Total	.01[a]
a. Number System and Counting	
b. Operations	
c. Decimal place value	
18. Computation Total	.05[a]
a. Addition	
b. Subtraction	
D. IAR Questionnaire	
19. I+	N.S.
20. I-	N.S.
21. I Total	N.S.
a. I+	
b. I-	

a) Students in learning disability groups scored higher on this factor than students in special day classes.

TABLE LIII

STATISTICAL LEVEL OF CONFIDENCE FOR EACH VARIABLE BETWEEN NORMS ESTABLISHED BY REGULAR STUDENTS AND STUDENTS IN EACH EDUCATIONAL CLASSIFICATION: LEARNING DISABILITY GROUP STUDENTS AND STUDENTS IN SPECIAL DAY CLASSES

VARIABLE	LEARNING DISABILITY GROUP	SPECIAL DAY CLASS STUDENTS
A. Creativity		
1. Fluency	.01[a]	(.20[a])[b]
2. Flexibility	(.20[a])[b]	(.05)[b]
3. Originality	.01[a]	.01[a]
4. Elaboration	.01	.01
B. Stanford Diagnostic Reading Test - Level 1		
5. Reading Comprehension	.01	.01
6. Vocabulary	.01	.01
7. Auditory Discrimination	.01	.01
8. Syllabication	.01	.01
9. Beginning and Ending Sounds	.01	.01
10. Blending	.01	.01
11. Sound Discrimination	.01	.01
C. Stanford Diagnostic Arithmetic Test - Level 1		
12. Number System and Counting	.01	.01
13. Operations	.01	.01
14. Decimal Place Value	.01	.01
15. Addition	.01	.01
16. Subtraction	.01	.01
17. Concept Total	.01	.01
a. Number System and Counting		
b. Operations		
c. Decimal Place Value		
18. Computation Total	.01	.01
a. Addition		
b. Subtraction		
D. IAR Questionnaire		
19. I+	.01[c]	.01[c]
20. I-	(.05[a,c])[b]	(.20[a,c])[b]
21. I Total	.01[c]	.01[c]

a. Students in the specified educational classification scored higher than the normative population on this factor.
b. Scores in parenthesis are not considered statistically significant for normative comparisons, but they are reported to keep the reader fully informed of the research findings and are suggestive of further research.
c. This is significant at the indicated level when using either the norm for males consisting of 139 students or the norm for the entire population (139 males and 131 females).

students in their grade level.

Table LII is a summary of the levels of significance for the difference between educational classifications for each variable. Table LIII succinctly presents the levels of significance for difference among educational classifications and the normative population for each variable tested.

SUMMARY

This chapter presented the data and its statistical implications related to this study. Decimal place value, addition, and number concepts were significant at the .01 level of confidence for the two educational categories. In addition flexibility, number system and counting, and computation total were significant at the .05 level of confidence. Two factors, sound discrimination and operations, were significant at the .20 level of confidence.

For creativity, only flexibility failed to discriminate between the educational categories and students in regular classes. Fluency also failed to show a significant difference between students in special day classes and the normative population. All other factors of creativity, academic achievement, and locus of control discriminated between the two educational categories and students in regular classes at the .01 level of confidence.

Chapter V will discuss the implications of these findings and offer recommendations for future action.

CHAPTER V

SUMMARY, RECOMMENDATIONS, AND CONCLUSIONS

The purpose of this study was to survey learning disability students and students in special day classes comparing them on selected characteristics to each other and to children attending regular day classes. The selected variables for this study were creativity, locus of control, and academic achievement. Each of these variables was divided into sub-parts permitting a more detailed analysis. Creativity was measured for the factors of fluency, flexibility, originality, and elaboration. Locus of control was separated into three scales, I+, I-, and I Total. Academic achievement was measured by the use of diagnostic reading and arithmetic tests. The following skills were tested in the area of reading: reading comprehension, vocabulary, auditory discrimination, syllabication, beginning and ending sounds, blending, and sound discrimination. The diagnostic arithmetic test had thirteen subtests. Only seven of the subtests were used and these were number system and counting, operations, decimal place value, addition, subtraction, concepts total, and computation total.

The population of this study consisted of forty randomly selected elementary students in special programs for the educationally handicapped. Twenty of the students were enrolled in learning disability groups while the remaining twenty students attended a special day class for educationally handicapped minors. All of the students were in either the third or fourth grade level school placement and attended the Napa Valley Unified

School District.

The remainder of this chapter will discuss the research findings and their interpretation with recommendations for future consideration.

Creativity

The data suggests that the students in both the learning disability groups and the special day classes did not differ from each other in the creative factors of fluency, originality, and elaboration. In the area of flexibility, the students in the learning disability groups were significantly more flexible in their drawing responses than the students in the special day classes. This would suggest that the learning disability group students were more capable of viewing objects as having characteristics of many categories rather than seeing them as only fixed objects. For example, the learning disability group students would see a chair as an object to sit in, as a piece of furniture, as an object of beauty, and as having many functional forms. Students in the special day classes would be more limited in their ability to categorize differently about the qualities and functions of the chair.

Learning disability students may be less able to elaborate on their work than students in regular classes. This data also indicates that the learning disability students may be more capable of giving many varied original responses and being more flexible in their answers than regular students. However, the learning disability students are less capable of giving details in their responses.

The data thus indicated that students in learning disability groups

are more rigid in their approach to solving problems (academic or personal) than regular school children. Because they are less able to elaborate than their peer group, their academic work will appear lacking in richness and therefore bland. Since they do have greater than average ability to give many original but not varied responses, their work will appear to be different or unusual but with repetitive responses which show little variety.

According to Torrance's interpretation of the originality and elaboration scores, learning disability students are more able to control their tensions and are not as anxious over what they perceive as expectations by others as normal students are.[1]

When comparing students in special day classes with normal students, the data indicates that students in special day classes are poorer at elaboration but better in originality.

Using Torrance's criteria for interpretation of test scores, one would feel that students in special day classes are more able than regular students to control their tensions and delay gratification. In addition, the special day students are less anxious over the possibility of not meeting their perceived expectations by others.[2]

Furthermore, the results indicate that students in special day classes are less right in their responses than average students. For

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[1]E. Paul Torrance, Torrance Tests of Creative Thinking: Norms-Technical Manual (Princeton: Personnel Press, 1966), pp. 14-15.

[2]Ibid.

example, their written work; such as compositions, would lack adjectives. Their responses would be more original and thus different from what would be normally expected.

Since both students in learning disability groups and students in special day classes scored as being more original than regular students, one wonders if this is not reflected in their demeanor. Since the line separating bizarre behavior from original behavior is a fine one and often not differentiated, one wonders if these students are often considered bizarre and hence possible behavior problems when in fact the behavior has more relevancy than we assumed.

In attempting to understand the creative process, two opposing viewpoints concerning creativity have been explored in this paper. The Freudian viewpoint holds that a neurotic conflict is necessary for the creative processes to unfold. Whereas, the Rogerians feel that a creative person must be free from emotional conflicts. Both of these theories may be the result of an over simplification of creativity and the creative processes. Possibly a new theory joining the seemingly opposing views could be constructed. For example, perhaps a tension is needed in order to motivate a person to find an activity which will release this tension but of itself is tension free. This, then, allows the person to be open to experiences and, in a Rogerian sense, mentally healthy while doing this activity. If the activity is acting as an escape mechanism, the need for avoidance is increased and the person's concentration of the new activity will be greater. This ability to concentrate on an activity is often part of the creative process.

After the person experiences success another phenomenon may take place. That is, the new experience in itself becomes the motivating factor rather than being the result of an avoidance mechanism. As the person becomes more successful in his activity, his self image will increase in a more positive manner, and this may carry over into other activities of his life.

If Guilford's theory of intellect is used in connection with the above proposal, then the creative person would need some potential ability in an area he chooses in order to be successful.[3] The amount of ability will set limits on his creative endeavors. This could account for the apparent observation that people have different creative levels.

Academic Achievement

In academic achievement students in learning disability groups were significantly higher than students in special day classes in the following five areas at the .05 level or better. 1. Number system counting, 2. Decimal place value, 3. Addition, 4. Concepts total (number system and counting, operation, and decimal place value), and 5. Computational total (addition and subtraction). Sound discrimination and operation scores differentiated at the .20 level of confidence. Furthermore, the data indicates that students in learning disability groups scored higher on all tests of academic achievement even though the differences, in some cases, were slight and not statistically significant.

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[3]J. P. Guilford, Intelligence, Creativity and Their Educational Implications (San Diego: Robert R. Knapp, 1968), pp. 128-136, 143.

This is not surprising since the admission committee used the student's past academic performance in determining his proper educational placement.

The data also indicates that all scores on the subtest in academic achievement for students in learning disability groups and students in special day classes were below their peer group, (significant at the .01 level). This suggests that the admission committee is, indeed, selecting students for special classes who have serious academic deficiencies.

Both the learning disability group students and students in special day classes have difficulty in recognizing phonemes, in matching phonemes with their corresponding grapheme; in recognizing sounds of single letters, two or three consonant letters, and diagraphs; in relating phonemes to corresponding graphemes; in dividing words into syllables; and in blending syllables into words. Furthermore, these students are deficient in recognizing the meaning of words and are low in reading comprehension. The students in this study are characterized by a limited vocabulary. This is reflected in their school work by the students' inability to be successful in reading and related skills.

These educationally handicapped students do not understand the concepts of the number system and are poor in computational skills (in addition and subtraction) thus experiencing low level of success in any activity relating to arithmetic.

This information leads one to believe that, as expected, the students in these special educational classifications are in serious need of remediation in academic areas, particularly the two academic areas which

are the foundation of all academic learning - reading and arithmetic. In addition, it appears that the students in special day classes are even more in need of remediation than the students in learning disability groups. These findings concur with previous research results cited in the review of the literature.

Locus of Control

The three subtests of locus of control show no significant difference between learning disability group students and students in special day classes for educationally handicapped minors. Both groups fell below the norm established by students in regular classes. However, using the .01 level of confidence, neither the students in learning disability groups nor students from special day classes differ from regular students in taking responsibility for their academic failures.

When both success and failure are viewed together as a composite trait (I Total Scale), it appears that these educationally handicapped students do not feel responsible for their performance as readily as other students. In general, then, students in learning disability classes along with students in special day classes see the world as externally controlled. These students frequently may not be motivated to learn because they do not recognize the cause-effect relationship between their efforts and the academic product.

The researcher feels that it is important to include in the daily classroom routine procedures that enable the teacher to illustrate to the students the relationship between their actions and their academic consequences. In addition, the teacher should provide some opportunities for

the students to chart and be responsible for their academic endeavors. These activities would help the students focus on the cause and effect relationships and define reality with respect to their academic pursuits.

Perhaps the behavior modification technique of operant conditioning offers some help in clarifying the cause-effect relationship. In this system the behavior and the consequence are clearly defined and related. This helps the child to examine his actions in light of the consequences (rewards or punishments).

RECOMMENDATIONS

Research

The data of this study suggests that there are two areas which need further research to clarify the distinction between the students in learning disability groups and students in special day classes. These two areas are sound discrimination and arithmetic operations. Both of these variables have a .20 level of confidence. It is therefore recommended that in future studies concerning learning disability groups students and students in special day classes that these two areas be replicated.

The data of normative comparison suggests that additional research is needed in five situations. Both students in learning disability groups and students in special day classes differed from regular students in two of these areas at a level indicative of further research thus yielding four research possibilities. These areas are in creativity (flexibility) and in locus of control (ability to take responsibility for one's academic successes or failures). Only students in special day classes differed from

regular students in fluency at a level significant to suggest future research (.20 level of confidence).

When collecting the test data from the teachers on the Stanford Diagnostic Arithmetic Test, the researcher became aware of the two following problems, It is apparent that these two tests need a gradation between easy and hard test items. Furthermore, the items start at a level too difficult for these students. The other problem is related to group testing. Many of the students become bored or frustrated while waiting for the group to complete each section, especially when the section was too difficult for them.

Therefore, the researcher recommends that other tests of academic achievement or of diagnostic quality be tried. Perhaps, a research project could be initiated to develop an appropriate diagnostic test to be used with students in learning disability groups and/or students in special day classes for educationally handicapped minors. Because of the short attention span and low frustration level of these students, it may be necessary to conduct all testing on an individual basis.

Research should be conducted to see if there is a significant difference in the test results gained by group diagnostic achievement tests versus individual administration. If a difference is found than a new study should be conducted comparing students in learning disability groups and students in special day classes to regular students, for this could alter the results of this present study dealing in this area.

Because of the overwhelming number of students in the lower socio-economic echelon the relationship between learning disabilities,emotional

problems and socio-economic status should be further explored.

This research has identified some of the important characteristics of these two groups. Further research along this line is still needed. For example, a research project is needed to investigate the modalities of learning of these two groups.

More data is needed on the variables of creativity. Further studies are needed to define more comprehensively this concept.

The relationship between apparantly bizzare behavior and creativity should be investigated. This relationship could be studied as part of a large correlative study comparing traits of mental health and factors of creativity.

Once areas of deficiency have been discovered, as has been with this present research project, other studies investigating the effectiveness of curriculum and various remediation techniques should be initiated. Such research is strongly recommended. Furthermore, the researcher would like to see other research projects utilizing the information gained in this project as it relates to curriculum and teaching techniques. For example, researching the effectiveness of letting the students create their own mathematical system and exploring the rules and relationships involved.

Curriculum

Since students from learning disability groups have high levels of fluency and originality, it is recommended that teachers use class activities which incorporate these traits. This would build on the positive abilities of these students and help enhance their self-image.

Remediation techniques which develop the ability to elaborate are needed. Art work is helpful in this area as is story telling where each student adds details, to form a more complex product.

If possible, the teacher should capitalize on the students in special day classes and students in learning disability groups in their ability to be original. For example, teachers should not be rigid in accepting solutions to problems and should encourage different patterns of attack while working on assignments. The teacher must encourage students to be original and try to see relevancy as the students see it.

The data clearly indicates that the subjects of this research project need remediation in all areas of reading and arithmetic with the special day class student having the greater need. When evaluating curriculum programs for students in California's program for educationally handicapped, the above significant findings of this study should be considered. The school curriculum should be revised taking into account the use and effect of these factors relative to providing a more meaningful educational environment.

CONCLUDING STATEMENT

This research indicated that students in learning disability groups and students in special day classes are more alike than they are different. However, where differences were found the students in learning disability groups scored higher. Both groups seem to differ significantly in certain respects from average elementary students (3rd and 4th

grades). Except for fluency, flexibility and originality the students in learning disability groups scored lower than the normative population. Students in special day classes only score higher than the normative population in fluency and originality. This points to the need for development and evaluation of curriculum and behavioral techniques relating to educationally handicapped students.

It is hoped that this research study gives impetus to future studies in the area of the educationally handicapped students. Further delineation of the characteristics representative of these students is in order. A greater understanding of the needs and problems of educationally handicapped students is needed if they are to be helped to their place as contributing members of society.

BIBLIOGRAPHY

BIBLIOGRAPHY

Baldwin, Wiltre Kate. "The Emotionally Disturbed and the Basically Maladjusted Child," a speech delivered to New Jersey Educators of the mentally retarded children in Atlantic City on November 12, 1964.

Bateman, Barbara. Interpretation of the 1961 Illinois Test of Psycho-linguistic Abilities. Seattle: Special Child Publication, 1968.

Beatty, Leslie S.; Madden, Richard; and Gardner, Eric F. Manual for Administering and Interpreting the Stanford Diagnostic Arithmetic Test: Level I. New York: Harcourt, Brace & World, 1966.

Blackham, Garth J. The Deviant Child in the Classroom. Belmont: Wadworth Publishing Company, Inc., 1967.

Bower, Eli. The Education of Emotionally Handicapped Children. California: California State Department of Education, 1961.

Bruning, James L. and Kintz, B. L. Computational Handbook of Statistics. Glenview, Ill.: Seat, Foreman & Co., 1968.

California Administrative Code, Title 5. Education (California State Document Section, Sacramento), 1969.

California Educational Code. (California State Document Section, Sacramento, California), 1969.

Clancy, Sarah, and Smelter, Faith. "A Study of Emotionally Disturbed Children in Santa Barbara County Schools," Emotionally Disturbed and School Learning: A Book of Teachings. Edited by Donald H. Clark and Gerald S. Lecker. Chicago: Service Research Association, 1965.

Crandall, Virginia et al. National Institute of Health Progress Report, Jan. 1, 1962-Dec. 31, 1965, pp. 110-117.

_____, et al. National Institute of Health Progress Report, December, 1968, pp. 60-65, Tables 2 and 3.

_____, Katkovsky, Walter, and Crandall, Vaughn J. "Children's Beliefs in their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, XXXVI (March, 1965), 91-109.

Crandall, Vaughn J.; Katkovsky, Walter; and Preston, Anne. "Motivational and Ability Determinants of Young Children's Intellectual Achievement Behavior," Child Development, 33 (1962), 643-661.

Demos, George O., and Gowan, John C. "Introduction," Creativity: It's Educational Implications. Edited by John C.Gowan, George D. Demos, and E. Paul Torrance, New York: John Wiley & Sons, 1967.

Johnson, Doris J., and Myklebust, Kilmer C. Learning Disabilities. New York, N.Y.: Grune & Stratton, 1967.

Feller, William. An Introduction to Probability Theory and its Application. New York: John Wiley & Sons, 1957.

Frierson, Edward C. "The Gifted." Exceptional Children Research Review. Edited by G. Orville Johnson and Harriett D. Blanch. Washington: Council for Exceptional Children, 1968.

Guilford, J. P. Intelligence, Creativity, and Their Educational Implications. San Diego: Robert R. Knapp, 1968.

_____. The Nature of Human Intelligence. San Francisco: McGraw Hill, 1967.

Gallagher, James T. "Children with Developmental Imbalance: A Psychoeducational Definition." The Teacher of Brain-Injured Children: A Discussion of the Basis for Competency. Edited by William M. Cruickshank. Syracuse: Syracuse University Press, 1966.

Glasser, William. Schools Without Failure. New York: Harper and Row Publishers, 1969.

Hall and Goodhue. The General Plan for the City of Napa /adopted by the City Council of the City of Napa on November 12, 1968/ Monterey, California, 1969.

Hall, Calvin, and Lindsey, Gardner. "Freud's Psychoanalytic Theory of Personality." Personalities and Cultures. Edited by Robert Hunt. New York: The Natural History Press, 1967.

Haywood, H. Carl, ed. Brain Damage in School Age Children. Washington: Council for Exceptional Children, NEA, 1968.

Hewitt, Frank. The Emotionally Disturbed Child in the Classroom. Boston: Allen and Bacon, Inc., 1968.

Hollingshead, August B. Two Factor Analysis of Social Position. New Haven, Connecticut: By author, 1965 Yale Station, 1957.

_____, and Redlich, Frederick C. Social Class and Mental Illness. New York: John Wiley and Sons, 1958.

James, W. H., "Internal Versus External Control of Reinforcement as a Basic Variable in Learning Theory," unpublished Ph. D. dissertation, Ohio State University, 1957.

Karlsen, Bjorn; Madden, Richard; and Gardner, Eric F. Manual for Administering and Interpreting the Stanford Diagnostic Reading Test: Level I. New York: Harcourt, Brace and World, 1966.

Kerlinger, Fred N. Foundation of Behavior Research. San Francisco: Holt, Rinehart and Winton, Inc., 1964.

Kintzele, Eugenia, and Axelrod, William. A Program Handbook on Secondary Classes for Educationally Handicapped. La., Miss.: Grossmont Union High School District, 1966-67.

Lefcourt, Herbert M. "Internal Versus External Control of Reinforcement: A Review," Psychological Bulletin, 65 (No. 4, 1966), 206-220.

Fouracre, Maurice H. "Learning Characteristics of Brain-injured Children." Exceptional Children, XXIV (January, 1958), 210-212, 223.

Meeker, Mary N. The Structure of Intellect: Its Interpretation and Uses. Ohio: Charles E. Merrill, Pub., 1969.

Morse, William C.; Cutter, Richard L.; and Fink, Albert H. Public School Classes for the Emotionally Handicapped: A Research Analysis. Washington: Council for Exceptional Children, 1964.

McGhee, Paul E. and Crandall, Virginia C. "Beliefs in Internal-External Control of Reinforcements and Academic Performance." Child Development, 3a (1968), 91-102.

O'Grady, D. J., "Psycholinguistic Abilities in Primary School Age Children with Learning Disabilities." Unpublished Ph. D. dissertation, University of Cincinnati, 1968.

Operation and Results of Special Educational Programs for Educationally Handicapped Minors. Report to the Governor and State Legislature of California, Sacramento, California, 1967. Sacramento, Calif: California State Department of Education, 1967.

Rekdahl, David, a private interview, Napa, California, September, 1970.

Rogers, Carl R. On Becoming a Person. Boston: Houghton Mifflin, 1961.

Rotter, Julian B. "Generalized Expectancies for Internal Versus External Control of Reinforcement." Psychological Monographs: General and Applied, 80 (Whole No. 609, 1966), 1-28.

Rowley, Vinton N. "Analysis of the WISC Performance of Brain Damaged and Emotionally Disturbed Children." Journal of Consult. Psychol. XXV (1961), 553.

Seaman, Melvin. On the Meaning of Alienation. Bobbs-Merrill Reprint Series in the Social Sciences. Indianapolis: Bobbs Merrill, 1959.

Solomon, Daniel; Houlighan, Kevin; and Porelius, Robert. "Intellectual Achievement Responsibility in Negro and White Children." Psychological Reports, 24, (1969), 479-483.

Stevens, Godfrey, and Birch, Jack W. "A Proposal for Clarification of the Terminology used to Describe Brain-injured Children." Educating Children with Learning Disabilities: Selected Readings. Edited by Edward C. Frierson and Walter B. Bache. New York: Appleton-Century Croft, 1967.

Strauss, Alfred A., and Lehtinen, Laura E. Psychopathology and Education of the Brain-Injured Child. New York: Grune and Stratton, 1947.

Torrance, E. Paul. Creativity, Dimensions in Early Learning Series. San Rafael: Simonson Publishing Co., 1969.

_____. Rewarding Creative Behavior: Experiments in Classroom Creativity. Englewood Cliffs: Prentice-Hall, 1965.

_____. Torrance Test of Creative Thinking: Directions Manual and Scoring Guide. Princeton: Personnel Press, 1966.

_____. Torrance Tests of Creative Thinking: Norms-Technical Manual. Princeton: Personnel Press, 1966.

Turabian, Kate L. A Manual for Writers of Term Papers, Theses, and Dissertations. Chicago: The University of Chicago Press, 1967.

U. S., Department of Health, Education, and Welfare. Minimal Brain Damage in Children, 1969. Bethesda, Maryland: National Institute of Health, 1969.

U. S. Department of Health, Education, and Welfare. Minimal Brain Dysfunction in Children: Terminology and Identification, 1966. Washington, D.C.: Government Printing Office, 1966.

Villa-Boas, M. C. C. "A Study of the Motivational Role of Self-Concept and Locus of Control in Creative Children." Unpublished Ph. D. dissertation, University of California, Berkeley, 1967.

Webster, Staten W., ed. The Disadvantaged Learner. San Francisco: Chandler Publishing Co., 1966.

Wilson, John R. and the Editors of Life and the Mind. New York: Time Incorporated, 1964.

APPENDICES

APPENDIX A

ADMINISTRATIVE CODE

TITLE 5 HANDICAPPED CHILDREN: 1969 CALIFORNIA

DIVISION 3. HANDICAPPED CHILDREN

CHAPTER 1. General Provisions and Miscellaneous Provisions

CHAPTER 2. Educationally Handicapped Pupils

CHAPTER 3. Mentally Retarded Pupils

CHAPTER 4. Physically Handicapped Pupils

CHAPTER 1. GENERAL PROVISIONS AND MISCELLANEOUS PROVISIONS

Article

1. Definitions and Scope
2. Reports of Handicapped Children (Education Code Section 6941)

Article

3. Payment of Tuition to Parent (Education Code Section 6871)

DETAILED ANALYSIS

Article 1. Definitions and Scope

Section
3100. Definitions

Article 2. Reports of Handicapped Children (Education Code Section 6911)

Section
3110. Prescribed Forms

3111. Submission and Distribution of Reports

Article 3. Payment of Tuition to Parent (Education Code Section 6871)

Section
3120. Application for Approval

* Article 1. Definitions and Scope

3100. Definitions. "Handicapped children" as used in this chapter means all of the following:

(a) Educationally handicapped minors as defined in Education Code Section 6750.

*For grants of assistance to teachers, see Section 5700ff.

(b) Mentally retarded minors as defined in Education Code Sections 6901 and 6902.

(c) Severely mentally retarded minors as defined in Education Code Sections 6901 and 6903.

(d) Physically handicapped minors as defined in Education Code Sections 6801 and 6802.

(e) Multi-handicapped minors, being any combination of the foregoing.

History: 1. New chapter 1 (Secs. 3100, 3110, 3111, 3120) filed 7-22-69; effective thirtieth day thereafter (Register 69, No. 30).

Article 2. Reports of Handicapped Children (Education Code Section 6941)

3110. Prescribed Forms. School districts and county superintendents shall submit reports of handicapped children on the following forms:

(a) For those participating in a special class, school, or program--Form No. D-1, entitled "First Period Enrollment Report for Special Education Programs." The form shall be furnished by the Superintendent of Public Instruction.

(b) For those not participating in a special class, school, or program--Form No. D-2, entitled "Report of Handicapped Minor Whose Application for Enrollment in School, Special Class, or Program Was Denied, and of Handicapped Minors Not Continuing in Attendance After Admission." The Superintendent of Public Instruction shall furnish this form to the county superintendents who, in turn, shall furnish them to the school districts.

Note: Specific authority for Article 2: Section 6946, Education Code. Issuing agency: Supt. of Public Instruction.

3111. Submission and Distribution of Reports. The forms prescribed in Section 3110 shall be prepared, submitted, and distributed in accordance with instructions appearing on the respective forms.

Article 3. Payment of Tuition to Parent (Education Code Section 6871)

3120. Application for Approval. (a) Original Application. Whenever the governing board elects, under the circumstances set forth in Education Code Section 6871, to provide for the education of a given physically handicapped minor by paying the minor's parent or guardian the amounts specified in that section, the governing board shall, on forms provided by the Superintendent of Public Instruction, apply to the Superintendent of Public Instruction for his prior approval. The governing board shall forward the completed application to the County Superintendent of Schools, who shall review the application and forward it with his recommendation to the Division of Special Schools and Services, State Department of Education. Approval of the Superintendent of Public Instruction

shall be valid to the close of the school year with respect to which application is made.

(b) Approval of Transfer. If, during a school year, the governing board deems it desirable that the minor transfer to a different public or private nonsectarian school, the governing board shall submit through the County Superintendent of Schools to the Superintendent of Public Instruction a request for prior approval of the transfer, specifying the reasons for transfer, the school to which such transfer is contemplated, the amount of tuition that will be charged by the school for the remainder of the period, and such other information as the Superintendent of Public Instruction may require.

(c) Continuing Education. Application for approval of continuing the education of a given physically handicapped minor under the provisions of Chapter 8.2 of Division 6 of the Education Code shall be submitted annually. In addition to all other requirements, the second and all subsequent applications for a given minor shall be accompanied by a written statement of the minor's school achievement for the prior school year. The statement shall be on the official stationery of, and signed by the person in charge of, the school or schools attended.

Note: Specific authority cited for Article 3: Section 6871, Education Code.

CHAPTER 2. EDUCATIONALLY HANDICAPPED PUPILS

DETAILED ANALYSIS

Article 1. General Provisions

Article 2. Program Standards

Article 3. Evaluation and Placement

Article 4. The Instructional Program

Article 5. Approvals

Article 1. General Provisions

3200. Scope of Chapter. This chapter applies only to special education programs for educationally handicapped minors for which allowances may be made under Education Code Sections 18102.6 and 18102.9.

Note: Specific authority cited for Chapter 2: Sections 6751, 6755, 6756, & 6757, Education Code.

History: 1. New Chapter 2 ($$ 3200, 3201, 3220-3224, 3230-3235, 3240-3242, 3250, 3251) filed 9-23-69; effective thirtieth day thereafter (Register 69, No. 39).

3201. Definitions. For the purpose of this chapter:

(a) "Program" means any of the special education programs for educationally handicapped minors described in Education Code Section 6751 that meet the general and specific standards set forth in this chapter.

(b) "Discharge" means exemption or exclusion from school by resolution of the governing board of a school district or by the county superintendent.

(c) "Transfer" means enrolling the pupil in any of the following:

(1) A different type of program authorized by Education Code Section 6751.
(2) A regular day class.
(3) A school or class authorized by Chapter 7 (commencing with Section 6500) of Division 6 of the Education Code.
(4) Another special program authorized by law.

Article 2. Program Standards

3220. General Standards for Programs. Every educationally handicapped

minors program shall meet the following general standards:

(a) It is the most appropriate one of the programs described in Education Code Section 6751 that meets the individual needs of the pupil. It provides for the differential grouping of pupils in classes, groups, or individually for effectiveness in administration, management, and instruction.

(b) It emphasizes the amelioration of handicapping conditions to the greatest extent possible and in the shortest period of time.

(c) It makes adjustments in the cirriculum and instruction that enhance the pupil's achievement to the fullest potential and provides for continued development in areas of pupil strengths.

(d) It provides for vocational education, work experience, and work study for those pupils who would benefit therefrom.

(e) It provides the educational, psychological, and pupil personnel services necessary for assessment, evaluation, and consultation.

(f) It provides for curriculum development, in-service education, consultation, and supervision for the staff.

3221. Specific Standards for a Special Day Class. A special day class shall meet the following standards:

(a) It is composed of pupils whose range of handicaps can be appropriately managed within the class.

(b) It shall be maintained for at least the minimum school day. The class shall be taught by a full-time teacher whose responsibility is to teach pupils enrolled in the class for the schoolday as established by the governing board for regular classes for pupils who are at the highest grade level in the special class.

3222. Specific Standards for a Learning Disability Group. A learning disability group shall meet the following standards:

(a) It is composed of pupils whose range of handicaps can be appropriately managed within the group.

(b) It is limited to educationally handicapped minors who are enrolled in one or more groups for instructional periods of at least 30 minutes in accordance with the recommendations of the admission committee.

(c) It limits a part-time teacher of learning disability groups to a total enrollment that is the same proportion of 32 as the number of minutes taught in learning disability groups is to the length of the regular school day.

(d) It provides specialized instruction for pupils in each group on a daily basis or, if less than daily, on a basis to correct the handicap in the shortest period of time.

(e) It allows opportunities for daily preparation for the teacher to provide an effective program of instruction and coordination with the pupil's regular program of instruction.

3223. Specific Standards for Home and Hospital Instruction. Unless health or other factors indicate otherwise, a pupil enrolled in home and hospital instruction is enrolled for, receives, 300 minutes of individual instruction

per week. In no event, is a pupil enrolled for, or does he receive, less than 150 minutes of individual instruction per week.

3224. Specific Standards for Specialized Consultation. Specialized consultation described in Education Code Section 6751 (c) shall meet the following standards:

(a) The consultation is given by specialists from such fields as education, speech, social work, psychology, medicine and psychiatry.

(b) The consultation relates to the specialized instruction, management, and guidance of pupils in a program, and to the in-service training of teachers and staff.

(c) State allowances for specialized consultation are used only to provide specialists not regularly employed by the district or county superintendent of schools administering the program.

(d) Expenses of identification and the admission committee are not paid from state allowances for specialized consultation.

Article 3. Evaluation and Placement

3230. Eligibility of Minors for Admission to a Program. An educationally handicapped minor described in Education Code Sections 6750, 6755, and 6755.2 is eligible for admission to a program if he has marked learning or behavior disorders, or both, associated with a neurological handicap or emotional disturbance. His disorders shall not be attributable to mental retardation. The learning or behavior disorders shall be manifest, in part, by specific learning disability. Such learning disabilities may include, but are not limited to, perceptual handicaps, minimal cerebral dysfunction, dyslexia, dyscalculia, dysgraphia, school phobia, hyperkinesis or impulsivity.

3231. Standards for Individual Evaluation of Pupils. A pupil described in Section 3230 shall be identified by individual assessment and evaluation of school records or written reports that include the studies described as follows:

(a) Educational Case Study. An educational case study of the pupil that includes:

(1) The school history and educational progress of the pupil including the specific measurements of his levels of academic functioning.

(2) Specific steps taken to assist the pupil in the areas of his handicap and the results of such assistance.

(3) The reason the pupil is unable to function in a regular class.

(b) Psychological Case Study. A psychological case study of the pupil by a credentialed or licensed psychologist that includes:

(1) Early development.

(2) Identification of the specific learning or behavior disorders or both and the relationship of these disorders to his school achievement. Specific handicapping conditions must be

described in functional terms sufficient to indicate the specific characteristics of the pupil's problems and to suggest the nature of an educational approach.

(3) Recommendations regarding methods and services from which the pupil may be expected to profit in the program and the anticipated results therefrom.

(c) Medical Study. A medical study, by a physician and surgeon licensed to practice in California, of the physical, neurological, and emotional basis for the pupil's learning or behavior disorders. The evaluation shall include:

(1) A statement that in the professional judgment of the physician there is a reasonable indication of a neurological handicap or emotional disturbance.

(2) A functional description of the pupil's neurological handicaps or emotional disturbance.

(3) A statement, in the case of a serious emotional disturbance, that the pupil is capable of participation in the educationally handicapped minors program and that the pupil's behaviors would not be inimical to the welfare of other pupils.

(d) Other Studies or Reports. Studies or reports from personnel in any other areas that the admissions committee deems necessary because of the specific problems of the pupil. These areas include, but are not limited to, speech and hearing, English as a second language, socio-cultural disadvantage, social work, and welfare and attendance. Absence of such reports indicates that the committee considers that such reports would not be of significance in evaluating the pupil's handicap or in planning his educational program.

3232. The Admission Committee. The administrative head of the school district or the county superintendent of schools shall designate members of an admission committee, which shall include, but not be limited to, the persons specified in Education Code Section 6755. One consideration in appointing members to the committee shall be the greatest possible continuity of committee membership.

Evaluation and recommendations shall be made by all five members of the committee specified in Education Code Section 6755 and such other specialists as the committee may deem necessary. There shall be present at a meeting at which the recommendations are made, a school psychologist and at least three of the remaining four specified members, provided the absent member has submitted a written statement of his evaluation and recommendations prior to the time of the meeting. In the absence of the physician, a school nurse shall be present. No member of the committee shall serve in more than one capacity.

3233. Standards for Admission Committee Recommendations.

(a) The admission committee shall make an evaluation of each individual pupil referred to it by making a thorough study of the records and reports described in Section 3231 together with all other pertinent and reliable information available. A written report of the committee's study

shall be filed with the district. The report shall include all of the following:

(1) The committee's findings regarding the nature and extent of the pupil's specific handicaps and the relationship of those handicaps to his educational and learning needs and ability to function in a regular class.

(2) The committee's finding regarding the particular educational approaches, methods, or services appropriate for the amelioration or correction of the pupil's learning or behavior disorders.

(3) The committee's findings regarding the ability of the pupil to profit from participation in a program, the anticipated results therefrom, and specific recommendations regarding the placement of the pupil in the most appropriate one of such programs.

(4) The committee's majority decision with the school psychologist and physician concurring, that the pupil is recommended for placement in accordance with the requirements of Education Code Section 6755 or 6755.2. The statement required in Education Code Section 6755 shall be included with the signatures and role of each concurring member present at the meeting of the committee at which a recommendation was made. Any member dissenting from the final committee recommendation shall attach a statement of reasons for such objection to the report.

(b) The committee may withhold a recommendation for placement of a pupil in a program whenever the committee determines that it does not have sufficient information to ascertain the pupil's eligibility or to recommend placement.

3224. Placement of Educationally Handicapped Pupils. The responsibility for the assignment of a pupil in a program rests with the administrative head of the school district or the county superintendent of schools or a credentialed employee designated by him. Assignment shall be made only in compliance with Education Code Section 6755.3 and in accordance with the program recommended by the admission committee. No pupil may be placed in a program transferred, or discharged prior to the recommendation by the committee.

3225. Re-evaluation, Readmission, and Transfer. (a) An annual examination and evaluation shall be made of the school adjustment and educational progress of each pupil enrolled in a program. The administrative head of the school district or the county superintendent of schools shall specify the personnel and methods to be used in the examination and maintain a written statement of such procedures. The procedures shall provide for consistency in the specific measurements used in determining academic progress. A written report shall be made of the examination and evaluation of each pupil and a copy thereof added to the pupil's case study file. The report shall include the following:

(1) A summary of the development and progress since the last

written evaluation report.

(2) The results of specific measurements of the pupil's progress in the academic areas of instruction.

(3) A summary of the methods and techniques which have been utilized in the instructional program.

(4) A current revision of the description of the nature and extent of the pupil's handicaps and ability to function in a regular class.

(5) Specific recommendations for the pupil's continuing education.

(b) The admission committee shall review the annual evaluation report of each pupil either upon the anniversary of the pupil's initial admission or at the end of each school year. If at the end of the admission period as specified in Education Code Section 6755.1, the pupil is found to be unable to return to a regular class, the committee shall again file the report required in Section 3233(a) in compliance with Education Code Section 6755.2.

(c) A pupil failing at any time to make an appropriate school adjustment or satisfactory educational progress in accordance with the prognosis and recommendations of the admission committee shall be referred by the chief administrator of the district to the admission committee or to an appropriate public or private resource for further study. Whenever further study fails to provide a basis for a more adequate prognosis, the pupil shall be referred to the admission committee for recommendations regarding transfer or discharge.

Article 4. The Instructional Program

3240. Curriculum Content. The curriculum content of any program shall be established under the following provisions:

(a) The curriculum is designed to fit the individual developmental and learning needs of each pupil as initially determined and reported by the admission committee. Adjustments are made in the curriculum as the pupil's progress requires.

(b) The amelioration of the learning or behavioral problems determined for each pupil is emphasized by giving specialized instruction in the areas of disability.

(c) Adaptations in methodology are made in the presentation of instruction, in the sensory modalities employed, and in the performance required of each pupil, whenever such adaptations will enhance his learning potential.

(d) The curriculum otherwise shall emphasize fundamental school subjects prescribed in Division 7, Chapter 3, (commencing with Section 8501) of the Education Code. A course of study for educationally handicapped minors in high schools shall be adopted which can be adapted to the individual needs of each pupil and provides the basis for graduation requirements for the pupil.

3241. Teacher Qualification. Any teacher may be assigned to give the

instruction specified in paragraphs (a), (b), or (d) of Education Code Section 6751 who possesses a valid regular teaching credential, or standard teaching credential, and who in the judgment of the administrative head of the school district or the county superintendent of schools possesses specific preparation, experience, and personal attributes deemed desirable for a teacher of educationally handicapped minors.

3242. Program Supervision. A school district shall provide supervision for all of its programs. The supervision may be by employees of the district or furnished through contracts with other school districts or county superintendent of schools. "Supervision" as used in this section, means those activities described in Section 5800(k) that have as their basic purpose the improvement of the instructional program for educationally handicapped pupils.

Article 5. Approvals

3250. Notice of Intention to Initiate a Program and for Prior Approval. (a) The notice of intention required by Education Code Section 6754 to initiate a program and the request for the prior approval shall be submitted to the Superintendent of Public Instruction at least 60 days prior to the date the program is to begin. The notice and request for prior approval shall be on a form furnished by the Superintendent of Public Instruction.

(b) If a district or county superintendent of schools maintaining an approved program that includes some, but not all, of the types listed in Education Code Section 6751, proposes to add another of such listed types, such addition shall be deemed to be initiation of a program, and the notice of intention to initiate the additional type of program and request for prior approval thereof shall be made in accordance with these regulations.

3251. Testing or Screening for Educationally Handicapped Minors. In the event a school system elects to test or screen through the use of tests administered directly to all pupils of a grade, school, or district pursuant to Education Code Section 6758, application shall be made for prior approval of the State Board of Education for the tests or screening procedures to be used.

APPENDIX B

CALIFORNIA EDUCATIONAL CODE RELATING TO EDUCATIONALLY HANDICAPPED MINORS: 1969

Minimum Schoolday for Certain Educationally Handicapped Minors

11008. With respect to educationally handicapped pupils provided instruction pursuant to Chapter 7.1 (commencing with Section 6750), Division 6 of this code, the minimum schoolday in kindergarten is 180 minutes; in grades one, two and three in elementary schools, is 200 minutes; and in grades four, five, six, seven and eight in elementary schools, is 240 minutes.

(Added by Stats. 1963, Ch. 2165.)

CHAPTER 7.1. EDUCATIONALLY HANDICAPPED MINORS
(Chapter 7.1 added by Stats. 1963, Ch. 2165)

Definition

6750. As used in this chapter, "educationally handicapped minors" are minors who, by reason of marked learning or behavior disorders, or both, require the special education programs authorized by this chapter with the intention of full return to the regular school program. Such learning or behavior disorders shall be associated with a neurological handicap or emotional disturbance and shall not be attributable to mental retardation.

(Added by Stats. 1963, Ch. 2165; amended by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Special Educational Programs; Application of Foundation Program

6751. The governing board of any school district or a county superintendent of schools with the approval of the county board of education, maintaining schools in juvenile halls or juvenile homes, ranches, or camps as authorized by the Welfare and Institutions Code, may provide for any one or more of the special educational programs for educationally handicapped minors authorized in this section. A county superintendent of schools may enter into an agreement pursuant to Section 6753 with the governing board of a school district having less than 901 average daily attendance in the elementary schools or less than 901 in the high schools of the district to provide any one or more of such special educational programs for the district, or the county superintendent of schools may enter into an agreement pursuant to Section 6753 with the governing board of a school district having an average daily attendance of 901 or more in the elementary schools of the district or 901 or more in the high schools of the district to provide only those special educational programs for

the district which are set forth in subdivision (a), (c), or (d), or any combination thereof. Whenever a special educational program for educationally handicapped pupils set forth in subdivision (a) or (d) of this section is provided by a county superintendent of schools for a district with an average daily attendance of 901 or more in the elementary schools of the district or 901 or more in the high schools of the district, pursuant to an agreement entered into pursuant to Section 6753, the foundation program prescribed in Section 17656 for an elementary district with an average daily attendance of 901 or more shall apply to educationally handicapped pupils of the elementary schools of the district who are in such a special education program and the foundation program prescribed in Section 17665 shall apply to educationally handicapped pupils of the high schools of the district who are in such a special education program. Such programs shall be provided in accordance with standards for each approved by the State Board of Education. The special educational programs for educationally handicapped minors are:

(a) Special classes (elementary and secondary). Under this program educationally handicapped pupils unable to function in a regular class are assigned to a special class. The special class shall be maintained for a minimum schoolday. In this program fundamental school subjects shall be emphasized as prescribed by the State Board of Education.

(b) Learning disability groups (elementary and secondary). In this program, the pupil remains in his regular class but is scheduled for individual or small group instruction given by a special teacher. Whenever two to four educationally handicapped pupils are instructed at the same time by the same teacher in a learning disability group conducted by a school district or county superintendent of schools, the total attendance credited for such pupils shall equal one unit of attendance for each 60 minutes of instruction.

(c) Specialized consultation to teachers, counselors, and supervisors (elementary and secondary). Under this program specialized consultation is provided teachers, counselors and supervisors relative to the learning disabilities of individual pupils and special education services required by such pupils.

(d) Home and hospital instruction (elementary and secondary). Under this program, a pupil who is unable to function in a school setting and who does not attend school receives instruction at the appropriate grade level at home or in a hospital or in a regularly established nonprofit, tax-exempt, licensed children's institution.

(Added by Stats. 1963, Ch. 2165; amended by Stats. 1965, Ch. 1176, by Stats. 1967, Ch. 1647 and Ch. 1653, and by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Maximum Class Size

6751.1 The maximum size for the special educational programs for educationally handicapped minors defined in Section 6751 shall be as follows:

(a) For special day classes the maximum enrollment shall be 12 pupils per class.

(b) For learning disability groups the maximum enrollment shall be 32; however, participation in any given learning disability group shall be for at least 30 minutes and shall not exceed eight pupils at any one time.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Limitation on Enrollment

6752. A school district maintaining special educational programs for educationally handicapped minors shall not enroll at any given time more than 2 percent of total district enrollment in such programs except as permitted by special authorization of the Superintendent of Public Instruction. As used in this section, total district enrollment means the average number of pupils, exclusive of pupils for whom a tuition payment is charged pursuant to Chapter 10 (commencing with Section 6950) of Division 6, enrolled at the end of the first school month and the sixth school month of the school year.

(Added by Stats. 1963, Ch. 2165; amended by Stats. 1967, Ch. 225 and Ch. 1647, and by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Prior Approval for Extension of Program

6752.1. In any fiscal year, extension of an existing program by a school district or county superintendent of schools which exceeds 120 percent of the prior year's enrollment shall receive the prior approval of the Superintendent of Public Instruction before any allowance or apportionment is made therefor for the purposes of this article.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Bases for Approval

6752.2. Approval of the Superintendent of Public Instruction pursuant to Section 6752.1 shall be based on but not limited to the following:

(a) Actual demand for the program as demonstrated by the recommendations for placement by the local admission committee authorized in Section 6755.

(b) District experience in the operation of programs for educationally handicapped minors.

(c) The demonstrated ability of the district to return educationally handicapped minors who can participate effectively, to the regular school program.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Agreement With County Superintendent to Provide Special Educational Programs

6753. The governing board of a school district which has an average daily

attendance of less than 901 in the elementary schools of the district or less than the 901 in the high schools of the district may enter into agreement with the county superintendent of schools to provide special educational programs for educationally handicapped minors. The governing board of a school district may enter into agreements with the governing boards of other school districts for the education of educationally handicapped minors. The district of residence having pupils receiving special education under the provisions of this section shall pay all current expenses entailed in providing such special education which are over and above all state apportionments made to the county superintendent or school district providing the program.

(Added by Stats. 1963, Ch. 2165.)

Application and Information to Superintendent of Public Instruction

6754. Before initiating any program for educationally handicapped minors the governing board of a school district or county superintendent of schools shall apply to the Superintendent of Public Instruction for approval to do so and shall furnish such relevant information with respect to such proposed special education programs as may be required by the Superintendent of Public Instruction. Such application and such information shall be on forms provided by the Superintendent of Public Instruction.

(Added by Stats. 1963, Ch. 2165; amended by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Admission; Individual Evaluation; Local Admission Committee

6755. Admission of minors to programs for the educationally handicapped established under the provisions of this chapter shall be made only on the basis of an individual evaluation according to standards established by the State Board of Education and upon individual recommendation of a local admission committee which shall include a teacher, a school nurse or social worker, a school psychologist or other pupil personnel worker authorized to serve as a school psychologist, a principal or supervisor, and a licensed physician. Such recommendation shall include a statement, that in the professional judgment of the members of the local admission committee the minor is recommended for placement in a program for educationally handicapped minors to correct marked learning disability due to a neurological handicap or emotional disturbance and that he may be expected to eventually participate in the regular school program. Any member of the local admission committee dissenting from the final committee recommendation shall attach to the final recommendation a statement of reasons for such objection.

(Added by Stats. 1963, Ch. 2165; amended by Stats. 1967, Ch. 1647; repealed and added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Duration of Admission

6755.1. Admission of educationally handicapped minors to programs under the provisions of this chapter shall have force and effect for a maximum of one school year.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Readmission

6755.2. If, in the professional judgment of the school district admission committee, at the end of the admission period authorized in Section 6755.1, any educationally handicapped minor is unable to function in a regular class, the minor may be readmitted to a program for educationally handicapped minors, and the local admission committee shall agree upon a statement that sets forth the reasons why the minor may not be returned to a regular class and the anticipated results of further participation of the minor in a special educational program.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Participation; Consultation With Parent; Parent's Consent

6755.3. No minor shall be required to participate in a program for educationally handicapped minors unless the local admission committee or a member of the local admissions committee appointed by such committee has personally consulted with the parent or guardian of the minor regarding the learning disorders of the minor and the objectives of the program, and the parent or guardian has subsequent to such counseling and prior to participation in a special educational program, filed written consent to such participation with the governing board of the school district or with the office of the county superintendent of schools.

(Added by Stats. 1969, Ch. 784. Effective August 15, 1969.) See note following Section 885.5.)

Standards for Individual Identification and Evaluation; Advisory Committee

6756. The State Board of Education shall adopt rules and regulations which shall prescribe standards for the individual identification and evaluation of educationally handicapped minors and their admission to special education programs for educationally handicapped minors. In arriving at such standards the State Board of Education shall receive assistance from an advisory committee consisting of one member from the State Department of Education, one member from the State Department of Mental Hygiene and one member from the State Department of Public Health, such members to be appointed by the heads of the respective departments named. In addition, such advisory committee may consist of such additional members as are appointed by the State Board of Education.

(Added by Stats. 1963, Ch. 2165.)

Standards for Special Educational Programs

6757. The State Board of Education shall adopt rules and regulations which shall prescribe standards for special educational programs for educationally handicapped minors which shall include, but need not be limited to, enrollment limits, curriculum content and teacher qualifications for each type of program authorized pursuant to this chapter, and provisions for periodic examination, re-evaluation, transfer and discharge of educationally handicapped minors participating in special educational programs maintained under the provisions of this chapter.
(Added by Stats. 1963, Ch. 2165.)

Testing or Screening of Pupils

6758. The testing or screening of all pupils in a particular grade, school, or district shall not be a condition of eligibility for apportionment under the provisions of Article 11 (commencing with Section 18101) of Chapter 3 of Division 14. In the event the governing board of a school district elects to do such testing or screening, only such tests or screening procedures as are approved by the State Board of Education for this purpose shall be used. School districts intending to do such testing or screening shall give written notice to the parents or guardians of the pupils concerned at least 15 days prior to such testing or screening and shall provide copies of any written instruments to be used for such testing or screening in the office of the principal of the school the pupils attend for examination by such parents or guardians. No minor shall be required to participate in such screening or testing unless the parent or guardian files prior written consent to such participation with the governing board of such school district.
(Added by Stats. 1963. Ch. 2165; amended by Stats. 1968, Ch. 1166, and by Stats. 1969, Ch. 784. Effective August 15, 1969. See note following Section 885.5.)

Supervisory and Consultative Services

6759. The Superintendent of Public Instruction shall establish supervisory and consultative services for programs for educationally handicapped minors and shall employ personnel who shall devote their entire time to the provision of such services.
(Added by Stats. 1963, Ch. 2165.)

6760. (Added by Stats. 1963, Ch. 2165; repealed by Stats. 1967, Ch. 1209.)

Duties of Superintendent of Public Instruction

6761. The Superintendent of Public Instruction shall:
(a) Prescribe the form and manner of notification of intention to initiate a program.
(b) Prescribe the procedures for qualifying for allowances for

special day classes, and for authorized instruction in other than special day classes of educationally handicapped minors.
(Added by Stats. 1963, Ch. 2165; amended by Stats. 1967, Ch. 1209, and by Stats. 1968, Ch. 928.)

6762. (Added by Stats. 1963, Ch. 2165; repealed by Stats. 1968, Ch. 928.)

Citation of Chapter

6763. This chapter may be cited as "The Waldie Act."
(Added by Stats, 1965, Ch. 1176.)

CHAPTER 7.2. GUARANTEED LOANS TO TEACHERS OF EDUCATIONALLY HANDICAPPED MINORS
(Chapter 7.2 added by Stats. 1969, Ch. 1198)

Note: Stats. 1969, Ch. 1198, also contains the following provisions:
SEC. 3. The Superintendent of Public Instruction shall submit a report to the Legislature at its 1971 Regular Session describing the program established by Chapter 7.2 (commencing with Section 6790) of Division 6 of the Education Code for the preparation of teachers to teach educationally handicapped minors and shall include in his report his recommendation concerning the desirability of the program.

Financial Assistance to Teachers of Educationally Handicapped Minors for Specialized Preparation

6790. In order to assure having for the ensuing year certificated personnel qualified to teach educationally handicapped minors, as defined in Section 6750, enrolled in programs of special education maintained by a school district or a county superintendent of schools, the governing board of the school district or the county superintendent of schools may enter into an agreement with any employee holding a position requiring certification qualifications who teaches, or any certified person under contract to teach, educationally handicapped minors for the ensuing school year for the school district or the county superintendent of schools, whereby the school district or the county superintendent of schools may make a loan of financial assistance, in such amount not in excess of that specified in Section 6792, as they may in writing agree upon, for such employee or certificated person under contract to undertake during the summers between academic school years specialized preparation, including courses, workshops, or specialized offerings, to teach educationally handicapped minors, as approved by the Superintendent of Public Instruction.
(Added by Stats. 1969, Ch. 1198.)

Reimbursement of School District or County Superintendent of Schools for Loans Made During Preceding Summer

6791. Not later than October 31 of each year, the Superintendent of Public Instruction shall allow, out of funds appropriated to the Department of Education for the purpose, to each school district or county superintendent of schools making loans pursuant to the provisions of this chapter an amount sufficient to reimburse each such district or county superintendent of schools for the total of such loans made during the summer immediately preceding pursuant to the provisions of Section 6792.
(Added by Stats. 1969, Ch. 1198.)

Maximum Reimbursement Allowable

6792. The amount of reimbursement allowed a school district or county superintendent of schools pursuant to Section 6791 for each such loan for specialized preparation undertaken during any given summer by any given employee or certificated person under contract shall not exceed the product of the number of semester hours taken in any given summer multiplied by fifty dollars ($50). The total amount of reimbursement allowed for all such loans to any given employee or certificated person under contract undertaking such specialized preparation shall not exceed the product of 30 semester hours multiplied by fifty dollars ($50). No more than five years shall elapse between the first and final allowance in reimbursement of such loans for any given employee or certificated person under contract.
(Added by Stats. 1969, Ch. 1198.)

Repayment of Loans

6793. Loans made pursuant to this chapter shall be repaid to the Department of Education pursuant to rules and regulations adopted by the Superintendent of Public Instruction.
There shall be allowed a 20-percent credit in the repayment of a loan for each year the recipient of the loan teaches educationally handicapped minors.
(Added by Stats. 1969, Ch. 1198.)

Rules and Regulations; Superintendent of Public Instruction

6794. The Superintendent of Public Instruction shall establish rules and regulations for the administration of the provisions of this chapter and shall employ personnel necessary for the efficient administration of this chapter and Chapter 8.5 (commencing with Section 6875) of this division.
(Added by Stats. 1969, Ch. 1198.)

APPENDIX C

To: Parents of Educationally Handicapped Pupils

From: Rodney Tognetti, Teacher of Educationally Handicapped Program and Doctorate Candidate at the University of the Pacific.
1005 Jefferson Street
Napa, California 94558

A research project in the area of the Educationally Handicapped is being initiated in the Napa Valley Unified School District Elementary schools under the joint supervision of the University of the Pacific and the Office of the Educationally Handicapped for Napa Valley Unified Schools. The study will be the basis of my Dissertation for a Doctorate in Education and at the same time provide useful information for the district teachers of educationally handicapped students.

As part of this study, I will need to test each child, individually, for no more than one hour in the area of creativity and self-concept. Your specific help is needed and can be accomplished by completing the few questions at the end of the letter and mailing them in the addressed envelope provided. The information in this questionnaire is coded and your identity will not be revealed. These questions are for the Head of Household.

Below (Item III) is a parent/guardian permission form. Will you please sign this. If you have any reservations or questions, please leave a message for me at the Office of the Educationally Handicapped Program (255-8010) and I will return your call.

May I urge the quick return of the form below.

Your cooperation is most appreciated.

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(please complete and return)

I. Occupation of Head of Household: ______________________
(Example: baker, teacher, carpenter, etc.)

II. Education: (please circle one)

a. Less than seven years of school.
b. Junior high education (completed 7th, 8th or 9th grade).
c. Partial high school education (completed 10th, 11th and/or part of 12th grade).
d. High school graduate.
e. Partial college training (completed one year, but less than four).
f. College or university graduate.
g. Graduate training (completed a graduate program for an advance degree or credential).

III. I give my permission for my child to be included in this study.

____
(Signature of parent/guardian)

RT/jak

APPENDIX D

To: Parents of Educationally Handicapped Pupils

From: Rodney Tognetti, Teacher and Doctorate Candidate at the
University of the Pacific
1005 Jefferson Street
Napa, California 94558

I mailed a questionnaire on December 10, 1970, to parents of selected children in the Napa Schools asking your cooperation in a research project. I have heard from 50% of the parents and would also like to hear from you.

I realize the Christmas season has put demands on your time, but if possible, please complete the new form below and return it in the stamped envelope provided for you.

If I don't hear from you within the next two weeks, I will assume that I have your permission to include your child in this study. If possible, I would rather have your written signature. Please, if there are any questions, please leave a message at the Office of the Educationally Handicapped Program - 255-8010 - and I will return your calls.

If you recently mailed the questionnaire in the first letter, please disregard this request.

Your cooperation is most appreciated.

- -

(please complete and return)

I. Occupation of Head of Household: ______________________________
(Example: baker, teacher, carpenter, etc.)

II. Education: (Please circle one)
   a. Less than seven years of school.
   b. Junior high education (completed 7th, 8th, or 9th grade).
   c. Partial high school education (completed 10th, 11th and/or part of 12th grade).
   d. High school graduate.
   e. Partial college training (completed one year, but less than four years).
   f. College or university graduate.
   g. Graduate training (completed a graduate program for an advance degree or credential).

III. I give my permission for my child to be included in this study.

____
(Signature of parent/guardian)

RT/jak

APPENDIX E

STANFORD DIAGNOSTIC ARITHMETIC TEST

STANDARDIZATION

The standardization program for SDAT was designed to yield the most fundamental types of information required for professional use of the test. This information included norms, intercorrelations among subtests, reliability, and equivalence of forms. The relationship between Stanford Achievement Test: Arithmetic Tests and SDAT subtests was also determined.

The standardization program was conducted in October 1965. All pupils[1] in each of four school systems were included in the program, for a total of approximately 8000 cases. Both Stanford Achievement Test: Arithmetic Tests and SDAT were administered, in that order, to all pupils, with a two-week interval between administrations. The tests were administered by classroom teachers in regular class sessions.

From the total group of pupils tested, samples were selected for the development of norms. It was felt that definition of the SDAT norm group in terms of performance on Stanford Achievement Test: Arithmetic Tests would allow development of a stable set of norms from relatively small but carefully selected samples of pupils. The final norm groups for SDAT are defined primarily in terms of their average and range of performance on the Stanford Achievement Test: Arithmetic Computation Test. It was decided that Arithmetic Computation, rather than Arithmetic Concepts or Arithmetic Applications, should be used in defining the norm group. To obtain this correspondence between norm groups the following procedure was used: first, 100 pupils per grade per form were randomly selected from the total group of pupils tested: the distribution of grade scores on Arithmetic Computation for these cases was compared with distributions of scores on this test in the Stanford Achievement Test national standardization; deletions and additions to the original sample were made in order to duplicate the Stanford Achievement Test norm group as closely as possible. It was felt that this procedure, combined with inclusion of pupils from several different school systems to account for variations in curricular practices from school to school, provided an adequate basis for the development of meaningful norms.

The communities in the norm group provided a fairly typical sample in terms of the average median family income and average median years of

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[1]An exception was made in the case of one very large system where samples mutually agreed upon by the system and the publisher were used.

school completed by the adult population in comparison with the national averages for these two indices. Considering the many changes taking place in the arithmetic curriculum at the present time, the type of curriculum in effect in the school systems used for norming is an important factor in describing the norm group. The school systems in the norming program could best be described as neither completely modern nor completely traditional, but "transitional"; that is, they were moving toward a modern mathematics program but had not adopted such a program on a systematic basis.

For the development of the grade score scales for Test 1: Concepts of Numbers and Numerals, and Test 2: Computation, all pupils in the grades appropriate for a single level of SDAT were combined into a single group. By an equi-percentile procedure, the equivalence of Test 1 and Test 2 total scores with Stanford Achievement Test: Arithmetic Concepts and Arithmetic Computation grade scores, respectively, was determined. In developing the Test 2 Total A+B+C+D for Grade 3, it was assumed that, if pupils in Grade 3 had taken Test 2D (Division) in the standardization, they would have obtained zero scores. This assumption seemed justified in light of evidence from the item analysis program, where Test 2D was administered to Grade 3 pupils.

Development of stanines for the various subtests for which they are provided was based on the samples described above for each of Grades 3 and 4 separately; distributions of scores on each subtest were plotted on normal percentile charts, a smoothed curve fitted to the points, and percentile ranks read from the curve. Stanines were obtained from these percentile ranks.

The ratings developed for the Number Facts subtests are based on judgments about the meaning of various levels of performance with respect to needed instruction. As indicated on page 21, a rating of A represents mastery of the number facts in a particular subtest; a rating of B indicates that a pupil is near a mastery level but seems to need work on a few number facts before real mastery is reached; a rating of C suggests that the pupil experiences considerable difficulty with a particular set of number facts and needs intensive work in the area.

The norms obtained from the standardization seem to be fairly stable representations of performance as indicated by the correspondence between average scores on the subtests obtained by the item analysis and standardization groups. These two groups were independently selected to provide representative samples. The means given for the "item analysis" represent mean subtest performance obtained from item difficulties for those items included in the final form (W) of the test. The data suggests that the standardization group is slightly better than the item analysis group in the conceptual areas. . . . the standardization group is slightly above the national norm in Arithmetic Concepts on Stanford Achievement Test. This situation probably reflects a national pattern, i.e.,

pupils are performing better in conceptual areas year by year as a result of the generally increased emphasis on concepts (even in "traditional" curricula).

Pupils in the standardization taking Form X served as the basic norm group. Form W norms were obtained by equating scores on Form W subtests with scores on the corresponding subtest in Form X by an equipercentile procedure. Form W and Form X samples were matched in terms of performance on Stanford Achievement Test: Arithmetic Computation. In general, corresponding subtests in the two forms were quite comparable in terms of difficulty, but norms differentiated by form are given to account for minor variations between forms.

Percentile ranks and stanines are determined at one particular point in time (October for SDAT) and are theoretically applicable only at that point in time. Use of the norms for other times will make the norms appear easier or more difficult than they should be. For example, if the stanine norms determined in October of Grade 3 are used for a group of pupils tested in December of Grade 3, this group of pupils will appear somewhat more proficient than they actually are. This caution should be kept in mind whenever interpreting tests administered at times other than October of Grade 3 or Grade 4.

Reference: Manual for Administering and Interpreting Stanford Diagnostic Arithmetic Test, pp. 33-34.

APPENDIX F

STANFORD DIAGNOSTIC READING TEST

STANDARDIZATION

The standardization program for SDRT was designed to yield the most fundamental types of information required for professional use of the test. This information included norms, intercorrelations among subtests, reliability, and equivalence of forms. The relationship between Stanford Achievement Test: Reading Tests and SDRT subtests were also determined.

The standardization program was conducted in October 1965. All pupils[1] in each of six school systems were included in the program, for a total of approximately 12,000 cases. Both Stanford Achievement Test: Reading Tests and the SDRT were administered, in that order, to all pupils, with a two-week interval between administrations. The tests were administered by classroom teachers in regular class sessions.

From the total group of pupils tested, samples were selected for the development of norms. It was felt that definition of the SDRT norm group in terms of performance on Stanford Achievement Test: Reading Tests would allow development of a stable set of norms from relatively small but carefully selected samples of pupils. The final norm groups for SDRT, then, are defined primarily in terms of their average and range of performance on the Stanford Achievement Test: Paragraph Meaning Test.

To obtain the correspondence between norm groups the following procedure was used: first, 100 pupils per grade per form were randomly selected from the total group of pupils tested; the distribution of grade scores on Paragraph Meaning for these cases was compared with distributions of scores on this test in the Stanford Achievement Test national standardization; deletions and additions to the original sample were made in order to duplicate the Stanford Achievement Test norm group as closely as possible. It was felt that this procedure, combined with inclusion of pupils from several different school systems to account for variations in the reading curriculum from school to school, provided an adequate basis for the development of meaningful norms. The stability of norms thus obtained was further confirmed by the close correspondence between mean performance by grade in the various subtests in the item analysis and standardization programs.

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[1] An exception was made in the case of one very large system where samples mutually agreed upon by the system and publisher were used.

For the development of the grade score scale for Reading Comprehension, all pupils in the grade appropriate for a single level of SDRT were combined; the equivalence of SDRT Reading Comprehension and Stanford Achievement Test: Paragraph Meaning scores was determined by an equi-percentile procedure. Development of stanine scales for Reading Comprehension and the other subtests in SDRT was based on samples for each grade separately; distributions of scores on each subtest were plotted on normal percentile charts, a smoothed curve fitted to the points, and percentile ranks read from the curve. Stanines were obtained from the percentile ranks. Although stanines are recommended for interpretation of results, percentile ranks, may be used.

Pupils in the sample taking Form X served as the basic norm group. Form W norms were obtained by equating scores on Form W subtests with scores on the corresponding subtest in Form X by an equi-percentile procedure. Form W and Form X samples were matched in terms of performance on Stanford Achievement Test: Paragraph Meaning. In general, corresponding subtests in the two forms were quite comparable in terms of difficulty but norms differentiated by form are given to account for minor variations between forms.

Although the norm sample for SDRT was selected so that it would be accurately defined in terms of Stanford Achievement Test: Paragraph Meaning grade scores, it is important to note that the entire group of pupils tested in the standardization came from a fairly normal set of communities as indicated by the median family income and median years of schooling completed by the adult population in these communities. Thus, severe problems of regression effects in the final norms are avoided.

Since the percentile rank and stanine norms were determined at one specific point in time (October), use of the norms for tests administered at some other time will make the norms appear easier or more difficult than they should be. But this effect should be approximately uniform across subtests so that identification of strengths and weaknesses--the main purpose of SDRT--should not be adversely affected.

Reference: Manual for Administering and Interpreting Stanford Diagnostic Reading Test, pp. 27-28.

APPENDIX G

NORMING DATA ON THE TORRANCE TESTS OF CREATIVE THINKING

Only limited sets of comparison group norms can be offered at this time. The author and publisher will continue to accumulate comparison group norms on a variety of kinds of populations ranging from kindergarten through graduate school. There is no plan at the present time to compile what might be called "children-in-general" type norms. An attempt will be made to describe the groups for which norms are presented and the variety of groups will be extended. Already test data have been accumulated on a greater variety of groups than is presented in this manual. Changes in scoring procedures and the pressures of time have reduced the number and variety of groups for which norms are presented in this manual.

The T-score conversion tables offered in this manual are based on the test performances of fifth grade pupils who took all four of the tests within a two-week period of time. The author and his associates have found this set of T-scores most useful in comparing relative levels of development or performance on verbal as opposed to figural; on fluency compared with flexibility, elaboration, and originality; from one group to another; and the like. The use of T-scores for all four tests of the same subjects also has the advantage of approximating equivalency. From the data given in this manual it is also possible to construct a set of T-score tables based on data from seventh graders. The author, however, has found that the ones based on fifth-grade data lend themselves satisfactorily to conversions at both the lower and upper levels educationally.

COMPARISON GROUP NORMS FOR FIGURAL FORM A

The major comparison group for Figural Form A is a large school system in southern California. This school system seems to draw from a wide range of socioeconomic levels and to have good psychological services. The sampling, arrangements for testing, and test administration was executed under the supervision of the director of psychological services for the school district. The tests were administered at each grade level near the end of the school year.

The examples in grades one through six from the University (Minnesota) Elementary School were tested by the author as a part of his longitudinal study of creative development in this school. The school enrolled only 25 pupils in each grade, so the entire school population was tested. The average intelligence quotient of the pupils in this school is about 120 as measured by the Stanford-Binet Intelligence Scales. The average education of the mothers of the pupils of this school is four years of college and of the fathers, six years of college. The school (now

discontinued) gave considerable emphasis to creative development in most classes.

The pupils from grades two through six in a Minneapolis school were also a part of the author's longitudinal studies of creative development. This school is located near the University of Minnesota campus and enrolls a disproportionate number of children from both the lower socio-economic class and from the upper-middle class. The average intelligence quotient of the children in this school as measured by the California Test of Mental Maturity is slightly above 100. One gathers the impression that some of the teachers in this school give some opportunities for learning in creative ways but that others teach primarily by authority.

The 40 fourth graders from a Bloomington, Minnesota, school were tested by their teacher, a young woman especially interested in creative development and creative ways of teaching. The 142 sixth graders from a Pennsylvania school were tested by a supervising principal especially interested in encouraging his teachers to teach in creative ways and to contribute to the creative development of their pupils.

The fifth and seventh grade data were derived from the test-retest samples described in Chapter III. The data for the T-Score conversion table derived from fifth grade pupils in Wisconsin were tested by the supervising teachers of a three-county area. All of the pupils live in rural areas and small towns but are in close proximity to a state college and to metropolitan Twin Cities.

Reference: Torrance, Norms-Technical Manual, pp. 56-57.

APPENDIX H

NORMATIVE DATA INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE

The sample was composed of 923 elementary- and high-school students and was drawn from five different schools so that it would be representative of children in diverse kinds of communities. Included were students from a consolidated country school, a village school, a small-city school, a medium-city school, and a college laboratory school. None came from a large metropolitan school system, however. Subsamples in various grades were: third grade, N = 102; fourth grade, N = 103; fifth grade, N = 99; sixth grade, N - 166; eighth grade, N = 161; tenth grade, N - 183; twelfth grade, N = 109.

The socioeconomic status (SES) of the children in grades 6, 8, 10, and 12 was determined by Hollingshead's Two Factor Index of Social Position (Hollingshead, 1957). This index is based on the type of occupation and amount of education of the head of the household, with these two factors weighted and summed. SES information was obtained from a questionnaire administered to the children. Complete information was obtained for all tenth grade Ss, but was acquired for only parts of the sixth-, eighth-, and twelfth-grade subsamples. However, Ss in these grades were in the same schools as the tenth-grade sample, and there was no evidence to suggest that the subsamples on which information was incomplete differed from those with complete information. For grades 3, 4, and 5, an estimate of the children's SES was obtained from their fathers' occupations only, since they were not able to provide information on their fathers' educations. Both SES distributions compare favorably with the normative sample of Hollingshead and Redlich (1958) except that neither is as heavily weighted with children from families on the lower end of the distribution. For the older children the distribution was normal (non-significant Fisher g_1 and g_2), and for the younger children the distribution showed some piling up of scores on the lower end of the range (Fisher g_1 significant at the .05 level). However even the distribution of the younger sample is still not as skewed as Hollingshead and Redlich report is true of their New Haven sample.

The California Test of Mental Maturity, the intelligence test used by all schools for grades 6, 8, 10, and 12 yielded a mean of 103.4 and an SD of 14.15. The intelligence test which all but one of the schools had used for grades 3, 4, and 5 was the Lorge-Thorndike. The mean Lorge-Thorndike score for the Ss who had had the test was 103.0 with an SD of 12.51.

. . . preliminary research indicated that children's average intelligence in the first two elementary grades often had difficulty in responding to the questionnaire, primarily because they could not keep an item and its two alternatives in mind long enough to make meaningful responses. As a result, only children in the third grade and above were used. Interviewing of the subjects used in the preliminary study also

indicated that some children in even the third, fourth, and fifth grades were not able to read well enough to take the test in written form. It was decided therefore, that individual oral presentation of the scale was desirable for children below the sixth grade, and it was administered in this fashion to the third-, fourth-, and fifth-grade samples. The questions were tape recorded so that each child was presented verbal stimuli which had the same inflections, time and rate. His oral responses were recorded by the examiner. The older children in grades 6, 8, 10, and 12 were administered the scale in written form in group sessions.

The instructions presented in both the oral and the written administrations requested the S to pick the answer "that best describes what happened to you or how you feel." He was told that there were no right or wrong answers and assured that his responses would not be given to anyone at his school.

Reference: Crandall, et. al., Children's Beliefs, pp. 97-99.

APPENDIX I

CHART I - RAW DATA FOR SUBJECTS IN SPECIAL DAY CLASSES: I.Q. > 97

Indiv. Identification	I+ (I Plus)[a]	I- (I Minus)[a]	I+ (I Total)[a]	Fluency[b]	Flexibility[b]	Originality[b]	Elaboration[b]	Number System Counting[c]	Operations[c]	Decimal Place Value[c]	Concepts Total[c]	Addition[c]	Subtraction[c]	Computation Total[c] (Addition + Subtraction)	Grade Score Concepts[b]	Grade Score Computation	Reading Comprehension[c]	Vocabulary[c]	Auditory Discrimination[c]	Syllabication[c]	Beginning and Ending Sounds[c]	Blending[c]	Sound Discrimination[c]	Grade Score Reading Comprehension	Grade (actual)	SES Score	SES Group	Age as of 9/1/70	I.Q.	Sex
1	5	5	10	62	59	84	57	2	2	3	3	1	1	1	2.6	1.6[d]	1	4	4	4	2	2	1	1.4[d]	4	64	V	9-11	104	M
2	7	8	15	28	35	41	25	2	1	2	1	2	2	3	1.5[d]	2.4	5	4	5	4	4	3	4	3.4	4	-	-	10- 0	98	M
3	4	7	11	40	44	38	38	3	3	2	2	1	2	1	2.5	2.9	3	2	4	1	3	3	2	2.3	4	-	-	9-11	100	M
4	9	4	13	52	50	71	38	3	3	3	3	2	5	3	2.0	2.5	1	1	1	1	1	1	1	1.4[d]	4	-	-	9-11	100	F
5	8	8	16	32	39	40	66	1	1	1	1	1	1	1	1.5[d]	-1.6[d]	1	2	2	3	1	2	4	1.4[d]	4	-	-	10- 4	102	M
6	8	10	18	42	44	68	43	1	1	2	1	2	1	1	1.5[d]	2.7	2	8	5	3	4	3	3	2.1	4	-	-	10- 6	99	M
7	6	8	14	58	33	63	42	2	2	3	2	1	1	1	2.4	2.7	2	1	3	3	3	4	1	2.8	4	60	IV	9- 3	103	M
8	7	8	15	70	50	100	59	3	3	2	1	2	6	3	1.8	2.6	2	2	3	1	1	3	1	1.8	3	-	-	9- 4	107	F
9	6	4	10	74	67	97	44	4	4	5	4	2	2	3	3.9	3.0	1	4	3	2	3	3	1	2.2	4	55	IV	9- 6	106	M
10	7	6	13	74	52	100	46	5	3	5	4	5	6	6	2.6	3.5	2	2	8	1	4	4	1	1.9	4	56	IV	10- 2	100	M

a) raw scores b) T scores c) stanine scores
d) grade placement below indicated level and testable limits

CHART II

AVAILABLE I.Q. SCORES FOR SUBJECTS IN SPECIAL DAY CLASSES: I.Q. > 97

Individual Identification	Verbal	Performance	Total I.Q.	Information[a]	Comprehension[a]	Arithmetic[a]	Similarities[a]	Vocabulary[a]	Digit Span[a]	Picture Completion[a]	Picture Arrangement[a]	Block Design[a]	Object Assembly[a]	Coding[a]	Mazes[a]
1	105	101	104	11	14	9	13	-	7	9	10	13	11	8	-
2	105	90	98	12	11	6	15	10	2	13	8	6	9	6	6
3	99	101	100	10	6	8	13	9	13	13	13	8	-	7	-
4			100	Stanford-Binet (LM)											
5	100	106	102	WISC Subtest Scores not available											
6	104	93	99	WISC Subtest Scores not available											
7	108	97	103	10	11	10	14	9	13	11	10	12	5	10	-
8	91	124	107	7	8	9	12	8	11	18	12	13	13	11	-
9	103	108	106	11	12	10	11	9	9	17	8	13	9	9	-
10			100	KENT EGY and Stanford-Binet (LM) Vocabulary											

a) scaled scores

CHART III

RAW DATA FOR SUBJECTS IN SPECIAL DAY CLASSES: I.Q. ≤ 97

Indiv. Identification	I+ (I Plus)[a]	I- (I Minus)[a]	I+ (I Total)[a]	Fluency[b]	Flexibility[b]	Originality[b]	Elaboration[b]	Number System Counting[c]	Operations[c]	Decimal Place Value[c]	Concepts Total[c]	Addition[c]	Subtraction[c]	Computation Total[c] (Addition + Subtraction)	Grade Score Concepts[b]	Grade Score Computation	Reading Comprehension[c]	Vocabulary[c]	Auditory Discrimination[c]	Syllabication[c]	Beginning and Ending Sounds[c]	Blending[c]	Sound Discrimination[c]	Grade Score Reading Comprehension	Grade (actual)	SES Score	SES Group	Age as of 9/1/70	I.Q.	Sex
1	6	8	14	49	40	62	45	2	1	3	1	2	4	3	1.5[d]	2.3	1	1	3	2	2	2	3	1.4[d]	3	62	V	9- 3	88	M
2	6	9	15	47	27	55	47	3	3	2	2	1	1	1	2.3	2.7	4	9	4	4	3	2	2	2.8	4	-	-	10- 4	91	M
3	6	6	12	55	50	79	48	1	1	1	1	1	1	1	1.5[d]	1.6[d]	1	1	1	1	1	1	1	1.4[d]	3	69	V	9- 9	87	M
4	4	4	8	48	48	63	33	2	1	1	1	1	1	1	1.5[d]	2.2	1	1	1	1	1	1	1	1.4[d]	4	47	IV	10- 1	85	M
5	5	5	10	68	65	80	38	1	2	1	1	1	1	1	1.5[d]	2.5	1	1	1	1	1	1	2	1.4[d]	4	73	V	10- 2	90	M
6	5	6	11	45	37	67	29	1	1	1	1	1	1	1	1.5[d]	1.6[d]	1	1	1	1	1	1	1	1.4[d]	3	-	-	8- 8	78	F
7	4	7	11	22	25	21	25	2	1	2	1	1	2	1	1.5[d]	2.4	1	3	1	3	4	3	1	1.6	4	55	IV	9- 8	86	M
8	6	7	13	72	55	90	39	2	4	3	3	1	4	2	2.6	2.9	1	2	1	2	3	2	5	1.4[d]	4	55	IV	10- 9	85	M
9	3	5	8	74	42	78	35	2	1	2	1	1	1	1	1.5[d]	1.6[d]	1	2	4	1	1	1	1	1.4[d]	3	-	-	9- 8	77	M
10	7	5	12	54	48	95	46	3	3	3	3	2	2	3	2.2	2.3	1	2	3	2	1	2	3	1.4[d]	3	62	V	8- 8	88	M

a) raw scores
b) T scores
c) Stanine scores
d) grade placement below indicated level and testable limits

CHART IV

AVAILABLE I.Q. SCORES FOR SUBJECTS IN SPECIAL DAY CLASSES: I.Q. ≤ 97

Individual Identification	Verbal	Performance	Total I.Q.	Information[a]	Comprehension[a]	Arithmetic[a]	Similarities[a]	Vocabulary[a]	Digit Span[a]	Picture Completion[a]	Picture Arrangement[a]	Block Design[a]	Object Assembly[a]	Coding[a]	Mazes[a]
1	90	87	88	8	9	8	13	6	6	11	7	7	9	7	-
2	-	-	91	Stanford-Binet (LM)											
3	91	85	87	8	9	7	12	9	6	10	7	4	11	7	-
4	85	89	85	WISC Subtest Scores not available											
5	85	97	90	-	-	6	7	11	6	8	-	12	-	9	-
6	69	93	78	5	-	6	6	6	-	3	8	-	9	12	6
7	82	93	86	5	7	6	9	7	9	11	7	8	11	8	-
8	81	93	85	5	8	6	9	7	7	7	7	10	13	8	-
9	87	71	77	-	-	-	-	-	-	-	6	4	5	-	-
10	89	89	88	7	12	8	6	-	8	11	8	9	8	6	-

a) scaled scores

CHART V

RAW DATA FOR SUBJECTS IN LEARNING DISABILITY GROUPS: I.Q. > 97

Indiv. Identification	I+ (I Plus)[a]	I- (I Minus)[a]	I+ (I Total)[a]	Fluency[b]	Flexibility[b]	Originality[b]	Elaboration[b]	Number System Counting[c]	Operations[c]	Decimal Place Value[c]	Concepts Total[c]	Addition[c]	Subtraction[c]	Computation Total[c] (Addition + Subtraction)	Grade Score Concepts[b]	Grade Score Computation	Reading Comprehension[c]	Vocabulary[c]	Auditory Discrimination[c]	Syllabication[c]	Beginning and Ending Sounds[c]	Blending[c]	Sound Discrimination[c]	Grade Score Reading Comprehension	Grade (actual)	SES Score	SES Group	Age as of 9/1/70	I.Q.	Sex
1	8	9	17	49	48	55	32	6	5	8	6	5	6	6	3.8	4.1	2	5	8	3	4	5	4	2.1	4	-	-	10- 4	99	M
2	4	3	7	67	57	100	33	2	2	4	2	2	2	2	2.5	3.0	4	4	4	1	4	2	3	3.0	4	-	-	8-11	115	M
3	10	9	19	74	55	85	64	5	5	2	4	3	2	3	2.4	2.6	2	5	8	5	4	3	3	2.1	3	25	II	9- 4	106	M
4	7	7	14	64	42	54	54	3	3	5	4	1	4	2	3.4	3.2	1	7	5	1	3	4	2	2.3	4	-	-	10- 3	100	M
5	8	5	13	55	50	67	29	3	3	4	3	3	2	2	2.8	3.1	1	2	2	1	1	2	2	2.2	4	-	-	10- 0	101	M
6	9	5	14	42	45	49	37	1	1	1	1	1	1	1	1.5[d]	1.6[d]	1	1	1	1	1	1	1	1.4[d]	3	-	-	8-10	106	M
7	5	4	9	65	69	89	58	2	4	3	3	5	3	4	2.0	2.7	1	5	4	3	4	3	3	1.4[d]	4	62	V	9-11	100	M
8	9	7	16	38	40	41	40	9	4	5	5	2	4	3	4.6	3.4	3	3	8	5	7	6	7	3.0	4	65	V	9- 4	107	M
9	2	6	8	58	59	78	41	4	3	4	3	3	2	3	2.2	2.4	1	2	1	1	1	1	3	1.4[d]	3	44	IV	8-10	102	M
10	6	6	12	39	45	54	64	5	1	5	3	5	4	5	2.2	3.0	1	1	1	1	1	1	1	1.4[d]	4	69	V	11- 0	106	M

a) raw scores
b) T scores
c) stanine scores
d) grade placement below indicated level and testable limits

CHART VI

AVAILABLE I.Q. SCORES FOR STUDENTS IN LEARNING DISABILITY GROUPS: I.Q. $\geq$ 97

Individual Identification	Verbal	Performance	Total I.Q.	Information[a]	Comprehension[a]	Arithmetic[a]	Similarities[a]	Vocabulary[a]	Digit Span[a]	Picture Completion[a]	Picture Arrangement[a]	Block Design[a]	Object Assembly[a]	Coding[a]	Mazes[a]
1	103	96	99	9	10	7	12	14	7	9	8	11	11	8	-
2	123	103	115	9	18	15	15	13	11	13	8	11	9	11	-
3	108	103	106	8	14	6	16	12	-	10	11	11	13	7	-
4			100	WISC Subtest Scores not available											
5	100	103	101	-	-	-	-	-	-	-	-	-	-	-	-
6	94	115	106	6	12	8	8	11	-	9	18	12	12	10	-
7			100	WISC Subtest Scores not available											
8	111	100	107	12	13	12	13	9	-	11	10	11	9	-	-
9	115	89	102	9	14	11	12	12	16	10	10	11	5	6	-
10	104	107	106	7	16	4	14	12	-	9	13	11	15	7	-

a) scaled scores

CHART VII

RAW DATA FOR SUBJECTS IN LEARNING DISABILITY GROUPS: I.Q. $\leq$ 97

Indiv. Identification	I+ (I Plus)[a]	I- (I Minus)[a]	I+ (I Total)[a]	Fluency[b]	Flexibility[b]	Originality[b]	Elaboration[b]	Number System Counting[c]	Operations[c]	Decimal Place Value[c]	Concepts Total[c]	Addition[c]	Subtraction[c]	Computation Total[c] (Addition + Subtraction)	Grade Score Concepts[b]	Grade Score Computation	Reading Comprehension[c]	Vocabulary[c]	Auditory Discrimination[c]	Syllabication[c]	Beginning and Ending Sounds[c]	Blending[c]	Sound Discrimination[c]	Grade Score Reading Comprehension	Grade (actual)	SES Score	SES Group	Age as of 9/1/70	I.Q.	Sex
1	6	6	12	67	45	100	31	3	1	3	2	4	3	4	1.7	2.6	1	3	4	3	1	1	2	1.4[d]	3	55	IV	8-10	87	M
2	2	6	8	57	55	89	39	1	1	5	3	5	4	5	2.2	3.0	1	1	1	1	1	1	1	1.4[d]	3	44	IV	8-10	97	M
3	4	9	13	39	40	41	25	2	2	1	1	1	1	1	1.5[d]	1.8	1	1	1	1	1	1	1	1.4[d]	3	73	V	9- 0	83	F
4	4	6	10	74	59	98	45	2	3	4	3	3	4	4	2.8	3.6	1	1	1	1	1	1	1	1.4[d]	4	66	V	10- 5	91	M
5	3	5	8	40	42	50	62	2	2	3	2	4	3	4	2.3	2.6	1	5	4	3	4	3	3	1.4[d]	4	48	IV	10- 9	87	F
6	5	7	12	69	59	72	38	2	1	3	1	2	3	2	1.5[d]	2.2	1	2	1	2	1	3	2	1.4[d]	3	44	IV	9- 5	92	M
7	8	5	13	74	52	100	27	3	3	5	4	5	4	5	3.3	3.8	1	3	4	2	3	4	2	2.1	4	59	IV	10- 0	91	M
8	4	6	10	58	63	69	42	5	3	3	3	1	1	1	2.7	2.8	1	5	2	2	3	1	3	2.1	4	-	-	10- 8	87	M
9	9	9	18	57	63	85	39	3	2	2	2	3	1	2	1.8	2.2	1	5	4	2	3	5	3	1.4[d]	3	51	IV	9- 9	88	M
10	6	6	12	68	54	91	34	3	3	2	2	3	2	3	1.7	2.5	1	3	1	3	4	3	4	1.4[d]	3	51	IV	9- 2	97	M

a) raw scores
b) T scores
c) stanine scores
d) grade placement below indicated level and testable limit

CHART VIII

AVAILABLE I.Q. SCORES FOR STUDENTS IN LEARNING DISABILITY GROUPS: I.Q. ≤ 97

Individual Identification	Verbal	Performance	Total I.Q.	Information[a]	Comprehension[a]	Arithmetic[a]	Similarities[a]	Vocabulary[a]	Digit Span[a]	Picture Completion[a]	Picture Arrangement[a]	Block Design[a]	Object Assembly[a]	Coding[a]	Mazes[a]
1	82	94	87	7	-	7	8	-	-	11	-	10	-	7	-
2	92	103	97	6	10	9	7	8	13	10	9	10	11	12	-
3	82	86	83	8	-	6	9	-	6	8	-	9	8	7	-
4	79	107	91	5	-	8	6	-	-	18	-	5	10	11	-
5	91	85	87	4	9	7	11	9	12	7	11	7	6	8	-
6	82	104	92	4	7	7	13	5	5	6	14	12	13	6	-
7	82	101	91	7	-	7	9	-	6	13	-	7	11	10	-
8	91	85	87	7	9	10	5	12	9	11	8	4	6	10	-
9	82	94	88	5	10	6	12	3	7	13	9	10	9	8	8
10	92	101	97	9	11	5	12	11	6	15	8	11	12	15	-

a) scaled scores