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THE EFFICACY OF MAINSTREAM EDUCATION

FOR EXCEPTIONAL CHILDREN

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Abstract

The purpose of this study was to ascertain if variables of academic achievement would extend the parameters of present knowledge concerning exceptional children in special and regular classroom placement. Thirteen exceptional children in grade five, who were currently enrolled in special classes and regular classes, in a North Central Texas community were matched within the standard error of measurement for Verbal and Nonverbal IQ's as measured by the Lorge-Thorndike Intelligence Tests, with thirteen students who were fully integrated into regular classes, who had been diagnosed as exceptional, and who comprised the control groups. Five hypotheses were formulated concerning the efficacy of partial special class placement for exceptional children over a two-year period, as measured by the eleven subtests of the Iowa Tests of Basic Skills. The findings of this study indicated that no statistically significant difference in treatment resulted between or among the experimental and control groups at the .05 level of significance. Therefore, remedial procedures in special classes had no significant effect beyond that obtained through regular classroom placement for exceptional children grades five through seven.

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N.W.E.

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Introduction

Special education has been in a state of ferment. At a time when many educators, parents, and federal agencies are bemoaning the inadequacy of provisions for exceptional children in the schools and seeking facilities for increased numbers of special classes, there are other groups demanding that children in special classes be returned to regular classes. The recent thrust for equal educational opportunity and the great concern for civil rights and liberties have lent an urgency to this discontent. The self-contained classroom has been questioned for the enrollment of exceptional children. A variety of instruments have been used in assessment of the efficacy of special classroom placement of exceptional children in relation to those exceptional children who remained in the mainstream of regular classes. Conclusive evidence had not resulted.

Review of Relevant Literature

In 1898 Alexander Graham Bell, who had stumbled onto the invention of the telephone while trying to develop an amplifying device for his deaf wife, told the audience

at the closing session of the National Education Association convention that the public school ought to establish programs for certain handicapped children. He suggested that these children "form an annex to the public school system" ("Educating Children", 1976, p. 23), receiving special instruction from special teachers, trained to teach the "deaf, blind, or mentally deficient without sending them away from the ordinary companions with whom they are associated." In 1902, the National Education Association responded by creating a department of special education ("Educating Children", 1976, p. 23).

With the growth of special education in this century has come a variety of alternative facilities for educating the handicapped. Residential schools were the first attempt to resolve the problem. These were established to help the severely retarded, emotionally disturbed, multiple handicapped, deaf, and the blind.

Day-school instruction for all categories of the handicapped had became increasingly popular in this century. It came under such auspices as ("Educating Children", 1976):

> Special classes housed in the regular school; special schools for all handicapped children or for specific categories of handicaps; cooperative services available on a regional basis where children are transported to the school to participate in special programs for all or part of the day; resource rooms in a school where children can go for special instruction geared to their handicaps; itinerant teachers who go from school to school, not only to teach the children but to serve as consultants to the regular classroom; mobile facilities, whereby vans with special equipment and special education

> teachers visit schools to provide diagnosis consultation with teachers, in-service training in new materials and equipment, and actual teaching of some children. (p. 23)

For years the administrative panacea for exceptional children has been the special class or special school. However, educators and legislators (Hamill & Bartel, 1971) have recently been seriously questioning the efficacy of these traditional forms of special education.

The controversy over special class placement reached a zenith during the 1940's and 1950's. Blackman and Goldberg (1965) described two distinct trends in the placement controversy. The first trend existed until the early 1940's and focused on the segregation of retarded children into special schools or placement in special classes within a regular school. The second trend argued that close proximity to normal peers was beneficial in the academic and social adjustment of these children, therefore taking educable mentally retarded children form special classes and integrating them into the regular classes was advocated. Little empirical data was available to conclusively substantiate a particular approach, therefore, many divergent views and opinions were explained on the basis of personal predilection (Blackman & Goldberg, 1965).

Administrators coping with the problems of finances, special equipment, program development, and the employment of specially trained teachers required the most accurate available data to substantiate decisions in special educational planning (Cegelka & Tyler, 1970). The increased

number of students became prohibitive. Several educators noted that a number of this increased load of "special" students were those individuals who regular teachers had classified as "problem" children (Dunn, 1971). Due to this increased load of referred children to special education, the mushrooming teacher preparation programs, and the influx of state and federal monies, made the comparison of regular and special classes a crucial issue (Cegelka & Tyler, 1970). The determination of the most advantageous placement, organization, and learning accommodations was necessary for the benefit of the children.

During the past forty-five years, numerous studies employing a variety of research designs, instruments, and samples have reported findings concerning the efficacy of special class placement for exceptional children (Cegelka & Tyler, 1970; Goldstein, 1967; Guskin & Spicker, 1968; Johnson, 1962; Kirk, 1964; MacMillan, 1971). Bennet (1932) contrasted fifty retarded children in special classes with retarded children in regular classes. All the children were between 12 and 13 years of age. The groups were matched on chronological age, mental age, and IQ, with a mean of about 73 for each group. Her results showed that the retardates who remained in regular classes were superior in academic achievement to those assigned to special classes.

Pertsch (1936) elaborated on Bennett's study by enlarging the sample to 278 children, ages 7 through 12, in special and regular classes. Again, the results indicated that the

retardates remaining in the regular classes were superior in academic achievement to those who had been assigned to special classes.

Elenbogen (1957) compared children with two years of enrollment in special classes in Chicago public schools with retardates in regular classes. The findings reported that regular class children surpassed those in special classes in academic achievement.

Blatt (1958) matched 75 educable mentally retarded children in special classes within a community where all educable mentally retarded children were purportedly enrolled in special education classes, with similar children in regular classes drawn from a community that had no special classes. He found no significant differences between the groups in reading, arithmetic, and language achievement.

Cassidy and Stanton (1959) followed Blatt's (1958) design, but increased the sample in each group to 94. In this study, the retarded children in the regular grades were superior in academic achievement to those placed in special classes.

Thurstone (1959) compared 769 educable mentally retarded children in special classes in North Carolina with 504 similar children in regular classes. The Stanford Achievement Test was used for the first evaluation which indicated that the children in regular classes scored significantly higher in all subtests with the exception of arithmetic. The testing procedures were repeated one year later to calculate gain

scores. There were no significant differences between the groups in the skills and information gained during the year.

Ainsworth (1959) compared educable mentally retarded children in Georgia in three types of educational settings. Forty-eight children were in special classes, 78 in regular classes, and 48 in regular classes receiving the services of an itinerant teacher who was a specialist in the field of teaching the retarded. The children were pretested with a series of academic achievement tests and were rated on behavior and social adjustment. One year later, they were retested. The collective data indicated that all three groups had made progress during the school year, however, no significant differences between groups resulted.

Wrightstone, Forlano, Lepkowski, Sontag, and Edelstein (1959) reported a study of special class educable mentally retarded children grouped by IQ in three types of special classrooms. The high educable group had IQ's approximating a range of 60 to 75; the low educable group, 50 to 59; and the third group was made up of both high and low educable children. The achievement data reported no appreciable differences between groups.

Schell (1959) conducted a two year study in a comparison of schools with and without special education classes. Fifteen pairs of children were matched on chronological age, mental age, IQ, and sex. Those in the experimental group were enrolled in special classes while the controls remained in regular classes. An expanded phase of the

study was the comparison of 54 retardates who had been in special classes for two years and 54 regular class retardates. Schell failed to find any differences in academic skills, however, both groups were performing at or above their mental age levels, a finding which was in agreement with Blatt (1958).

Mullen and Itkin (1961) compared 140 educable mentally retarded children in special classes with 140 similar children in the regular classes matched on pair design. The following seven variables formulated the basis for matching: age, IQ, sex, socioeconomic status, reading achievement, school attendance in the rural south, and foreign language spoken in the home. Assessment of the pre- and posttests, after one year, showed no group differences in academic achievement gains with the exception that the retardates in the regular classes gained more in arithmetic than did the special class children.

As part of a four year comprehensive study of 1,938 first grade children, Goldstein, Moss, and Jordan (1965) examined the special-regular class issue in terms of intellectual gains, social adjustment, and academic achievement. In an effort to control for a major weakness in previous efficacy studies, the children were tested upon entering the first grade before failure experiences in school could be encountered. Only children with measured IQ's of 85 and below were used in the sampling. Random assignment was made to either newly created special or regular classes. Control was again attempted by utilizing

a consistent curriculum for the special class sampling throughout the four year project along with the employment of specially trained teachers for close supervision. In an effort to improve upon previous studies, the authors introduced new evaluation instruments to more adequately measure the goals of the special class, in particular, social and occupational. The writers stated (Goldstein, Moss, & Jordan, 1965) that "if significant results could not be demonstrated under the best of conditions, or if these results were only of a borderline significance, the need for research under less ideal conditions would be obviated" (p. 70).

The results of this study found that both the experimental and control groups showed significant gains in IQ, however, no significant differences resulted in academic achievement. Jordan (1965) reported that after two years, the control group showed superior reading skills, but that this difference disappeared by the conclusion of the study.

Spicker and Bartel (1968) have reviewed this study and concluded:

> The fact that under these ideal conditions the experimental subjects performed no better than the control subjects indicates either special classes are ineffective for the educable mentally retarded, that the curriculum used was inadequate, and/or that first grade special class placement based only on intellectual subnormality (IQ of 85 or below) does not result in better school performance than does regular class placement. (p. 51)

Carroll (1967) conducted a study over one school year to assess academic achievement as measured by the Wide Range Achievement Test for a group of segregated educable mentally

retardates and a group of partially integrated educable mentally retardates with normals. Significant results were found in reading with the improvement in favor of the partially integrated group. Carroll (1967) stated that her results gave partial support to those studies showing educable mentally retarded children achieving better among normal peers.

Stanton and Cassidy (1964) suggested that the overall differences in performance among the higher retardates (70-79 IQ) justified placement in the regular classrooms. Goldstein (1964) suggested that an entirely different approach be utilized in placement for educable mentally retarded children. He recommended children be placed according to learning profiles and other relevant learning characteristics rather than on the basis of chronological age and IQ. In any event, the time had arrived whereby specific intervention strategies would be attempted to determine the various conditions within each special and regular class structure which would lend toward proper learning and maximum classroom efficacy.

Today such terms as "normalization" (Wolfensberger, 1972), "de-labeling" (Forness, 1974), and "mainstreaming" (Birch, 1974) are becoming popular. Resource room programs have gained increased recognition due to their link with mainstreaming (Hamill & Wiederholt, 1972; Reger, 1973; Sabatino, 1972).

The concept of mainstreaming (Cantrell & Cantrell, 1976),

simply stated requires that "exceptional children be educated in the same environment as all other children whereever possible" (p. 381). Support for the innovation of mainstreaming has developed out of earlier concerns over the doubtful efficacy of the traditional approaches of separating educable mentally retarded children (hereinafter referred to as exceptional children) from their peers for special education services (Ainsworth, 1959; Bennett, 1932; Blatt, 1958; Carroll, 1967; Elenbogen, 1957; Filler, Robinson, Smith, Bricker, & Bricker, 1974; Goldstein, Moss, & Jordan, 1965; Mullen & Itkin, 1961; Pertsch, 1936; Schell, 1959; Spicker & Bartel, 1968; Thurstone, 1959).

Cantrell and Cantrell (1976) suggested in their study that "borderline intelligence children can be maintained within the regular public school classroom . . . high IQ children were not penalized by such activity in their achievement growth" (p. 385). Their study supported the argument that mainstreaming was possible in public school regular classrooms.

Thus far, no quantifiable study has been conducted evaluating the academic achievement of exceptional children partially integrated with normals through the use of regular classes and resource rooms within the same school building and those exceptional children integrated entirely into regular classes, as measured by the Iowa Tests of Basic Skills (Lindquist & Hieronymus, 1964) over a two year period. This study, therefore, compared the performance of both groups

on each diagnostic variable in an effort to extend the parameters of our present knowledge of mainstream education for the exceptional child on a scientific basis.

Summary

Research in the field of exceptional children proceeded from diverse theoretical orientations, leading to a profusion of speculation. The historical foundations were traced to the mentally and physically handicapped children ("Educating Children", 1976). A concerted effort during the past 45 years on the part of several researchers was made to distinguish if significant underlying differences existed between exceptional children in special classes as evaluated against those exceptional children who remained in regular classes in academic achievement (Blatt, 1958; Cegelka & Tyler, 1970; Goldstein, 1967; Goldstein, Moss, & Jordan, 1965; MacMillan, 1971). Several researchers indicated there were no significant differences in academic advancement prevalent among the two groups.

Therefore, as an outgrowth of such research and the specific premise of Cruickshank (1958) that "not all exceptional children need special education" (p. 20), this study sought to scientifically investigate the academic achievement of exceptional children partially integrated with normals through regular classes and resource rooms and those exceptional children fully integrated into regular classes. The aspect of academic achievement was selected

for the investigation because (a) it was based upon tenable theory (Cantrell & Cantrell, 1976; Carrol, 1967; Goldstein, 1964), (b) it provided useful variables for assessment purposes, and (c) research indicated that the variables were worthy of further study (Blatt, 1958; Goldstein, Moss, & Jordan, 1965; Jones & MacMillan, 1974; Nelson & Schmidt, 1971).

Chapter II

The Problem and Procedures

There has been no clear-cut empirical evidence presented in the reviewed literature to support the belief that exceptional children placed in special classes and partially integrated with normal children through regular classes, gained significantly in intellectual or academic achievement. Therefore, the background of this study supported the need for further research. Lindquist and Hieronymus (1964) developed scales to assess variables which contributed to basic educational development. The major problem area of this study was the t-analysis of these diagnostic variables which were used to evaluate significant differences of performance between and within two groups of exceptional children.

Statement of the Problem

An attempt was made to ascertain if significant differences resulted between a group of exceptional children partially integrated with normals through the use of regular classes and resource rooms and those exceptional children fully integrated into regular classrooms, as measured by the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964). This study was an attempt to extend the parameters of present understanding of variables affecting exceptional children.

Operational Definitions

For the purposes of the investigation, important terms were defined in the following manner:

1. Exceptional children: Referred to in this study as those children with a functional verbal IQ range of 69-97 and a nonverbal IQ range of 69-102, as determined in grade five, prior to placement in special classes, by the Lorge-Thorndike Intelligenge Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964). Each child experienced academic deficits due to one or more of the following characteristics: hyperactivity, emotional lability, perceptual-motor impairments, general coordination deficits, disorders of attention, impulsivity, disorders of memory and thinking, disorders of speech and hearing, or equivocal neurological signs.

2. Special classes: Classes housed in the regular school, usually referred to as "resource rooms", for special instruction geared to the handicaps of exceptional children.

3. Experimental group: Exceptional children partially integrated with normals through the use of regular classes and resource rooms.

4. Control group: Exceptional children who have remained fully integrated with normals through the use of regular classes.

Hypotheses

The following hypotheses were the bases for the design and conduct of this study:

Hypothesis 1: There are no statistically significant

differences in mean raw scores between or among the experimental and control groups as measured by the Iowa Tests of Basic Skills subtest of Vocabulary.

Hypothesis 2: There are no statistically significant differences in mean raw scores between or among the experimental and control groups as measured by the Iowa Tests of Basic Skills subtest of Reading.

Hypothesis 3: There are no statistically significant differences in mean raw scores between or among the experimental or control groups as measured by the Iowa Tests of Basic Skills major area of Language, in each of four aspects of development: Spelling, Capitalization, Punctuation, and Language Usage.

Hypothesis 4: There are no statistically significant differences in mean raw scores between or among the experimental or control groups as measured by the Iowa Tests of Basic Skills major area of Work-Study, in each of the three aspects: Map Reading, Reading Graphs and Tables, Knowledge and Use of References.

Hypothesis 5: There are no statistically significant differences in mean raw scores between or among the experimental or control groups as measured by the Iowa Tests of Basic Skills major area of Arithmetic, in each of the four aspects: Arithmetic Concepts, Problem Solving, Modern Math, Arithmetic Problems.

The Subjects

The population from which the samples for both the experimental and control groups were obtained, included fifth grade children who had received no prior special education enrollment, and who had achieved scores within the functional Verbal IQ range of 69-97 and Nonverbal IQ range of 69-102, as measured in the Fall, by the Lorge-Thorndike Intelligence Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964). All children meeting these requirements in a medium-sized town in North Central Texas were eligible for admission to the study. The total fifth grade population from which these children were selected for remedial attention was 2,306.

The classes for exceptional children were limited to an enrollment of no more than ten children per class by regulation of the Special Education Section of the Texas State Department of Education. A total of 13 children for whom there was completed test data available and who had been partially integrated with normals through regular classes and special classes for the duration of the study, were able to be included in the experimental sampling.

A total of 13 children who met the requirements of the study were drawn from the population. These 13 children comprised the control group and were those who had been diagnosed as "exceptional" and eligible for special class placement, however, they had remained fully integrated into regular classes. The majority of the children in both groups

were white, two in each group were Black, and one in each group was American Indian.

Procedures

The certified school counselors of the North Central Texas school district administered the Lorge-Thorndike Intelligence Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964) to its fifth grade population, in the Fall of that school year. Subsequently, the Verbal and Nonverbal IQ's obtained by the experimental group sampling were matched by the standard error of measurement appropriate for each child, to formulate a comparable control group. Conferences were held with the teachers and counselors to determine the origins of specific learning deficits which had retarded the academic progress of students in both groups, as a means for control and matching.

The Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964), was administered in March of the same year to the fifth grade population by certified school counselors of the North Central Texas community. Thereby a baseline for further evaluation had been established.

The experimental group received a standardized special education curriculum developed by the independent school district; the control group remained in the regular classes with no special class assistance for the following two years, their curriculum was directed by the jurisdiction of regular class programs.

In March of their seventh grade year, the certified school counselors administered the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964), to the population. The scoring of each Iowa Test of Basic Skills as well as the Lorge-Thorndike Intelligence Tests, were completed by the electronic test-processing equipment at the State University of Iowa. The tests were sent to the Houghton Mifflin Scoring Service in Iowa City, Iowa.

Instrumentation

The authors postulated that the skills examined were essential in educational development and that they largely determined the extent to which the pupil would profit from later instruction (Lindquist & Hieronymus, 1956, 1964).

The skills measured were classed into five major areas: Vocabulary, Reading, Language, Work-Study, and Arithmetic. A single comprehensive test was provided in each of four aspects of Language development: Spelling, Capitalization, Punctuation, and Usage. Three subtests in the Work-Study area were concerned with Map Reading, Reading Graphs and Tables, and Knowledge and Use of References. In the area of Arithmetic, separate subtests were provided in the fifth grade for Arithmetic Concepts and Problem Solving, and in the seventh grade for Modern Math and Arithmetic Problems (Lindquist & Hieronymus, 1956, 1964).

The Iowa Tests of Basic Skills differ from most other elementary achievement test batteries in that they were

concerned only with generalized intellectual skills and abilities, they did not provide separate measures of achievement in the content subjects (Lindquist & Hieronymus, 1964). The major reason for this, in the authors' opinion, was that "measures of the basic intellectual skills were far more valuable for use in the improvement and individualization of instruction and in educational guidance than in measures of the acquisition of specific information in special subjects" (Lindquist & Hieronymus, 1956, p. 13).

The multi-level design was adopted for the Iowa Tests of Basic Skills because it had "long been known that a test designed expressly for a given grade is a better instrument for that grade than one designed for a two or three grade spread" (Lindquist & Hieronymus, 1956, p. 13).

All tests were contained within a single 96 page booklet for convenience of administration. Each pupil was tested only on items appropriate in content and difficulty to his own grade level. It was implied that the integrated academic achiever would both satisfactorily resolve the basic skills tested and harmoniously maintain a balance among them (Lindquist & Hieronymus, 1956, 1964).

Summary

The Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964) was selected as the instrument for assessing academic achievement of exceptional children partially integrated with normals through regular classes and special

classes as compared with exceptional children fully integrated with normals through regular classes. The children studied had all been diagnosed as exceptional children, according to performance on the Lorge-Thorndike Intelligence Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964) and the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964), followed up by teacher/counselor evaluations and recommendations for placement. Scores for the five basic areas were obtained to establish the baseline for the study. The Iowa Tests of Basic Skills was administered two years later for a basis of assessing statistically significant differences in gain between and among both groups.

Chapter III

Design and Statistical Analysis

Design

The *t*-analysis was obtained to determine if significant differences resulted between or among the experimental and control groups, thereby determining if the treatment of partial special class placement attirbuted to academic achievement of exceptional children. The analysis provided information on the significance of gains in academic achievement as assessed by eleven variables of the Iowa Tests of Basic Skills. The results of the analyses are presented in Tables 1 and 2 and Tables 3 and 4 for between group results and within group results, respectively.

Statistical Analysis

The children in the experimental and control groups were tested for academic achievement in three major areas involving eleven variables. A slight statistical significance was obtained for two of the variables which merited listing. The subtest of Vocabulary resulted in a slightly significant difference in favor of the control group at the fifth grade level, $t\ (11) = 2.239$, $p < .05$. In the follow-up two years later, the difference had subsided and no statistical difference resulted between the two groups, $t\ (11) = 1.145$, $p > .05$.

On the subtest of Capitalization a significant gain

Table 1

t Analysis Between the Experimental and Control Groups at the Fifth Grade Level

Subtests	$\bar{X}^a$	$\bar{X}^b$	$S_{x_1-x_2}$	t-Value
Vocabulary	11.534	14.846	1.479	2.239*
Reading	20.154	24.769	3.432	1.345
Spelling	9.846	11.154	2.619	.499
Capitalization	9.154	13.000	1.751	2.196
Punctuation	9.385	10.308	1.335	.691
Language Usage	6.231	9.462	1.539	2.099
Map Reading	9.308	12.385	1.759	1.749
Graphs and Tables	7.384	9.154	1.473	2.089
Reference Materials	12.847	16.923	2.619	.676
Modern Math	13.538	12.462	2.433	.442
Arithmetic	10.077	9.462	2.761	.223

[a]Experimental Group

[b]Control Group

*Significant at .05 level

Table 2

t Analysis Between the Experimental and Control Groups at the Seventh Grade Level

Subtests	$\bar{X}^a$	$\bar{X}^b$	$S_{x_1-x_2}$	t-Value
Vocabulary	12.692	15.461	2.419	1.145
Reading	22.385	21.846	1.859	.289
Spelling	9.385	12.231	1.961	1.451
Capitalization	11.308	9.077	1.264	1.765
Punctuation	11.846	12.200	1.655	.214
Language Usage	9.231	8.846	1.261	.305
Map Reading	10.692	9.770	1.362	.677
Graphs and Tables	8.000	6.385	1.010	1.599
Reference Materials	16.692	18.615	2.474	.777
Modern Math	11.308	13.154	1.154	1.599
Arithmetic	7.923	9.154	1.046	1.177

[a]Experimental Group

[b]Control Group

Table 3

t Analysis of Combined Fifth and Seventh Grades Within the Experimental Group

Subtests	$\bar{X}^a$	$\bar{X}^b$	$S_{x_1-x_2}$	t-Value
Vocabulary	11.534	12.692	1.737	.667
Reading	20.154	22.385	2.439	.915
Spelling	9.846	9.385	2.206	.209
Capitalization	9.154	11.308	1.407	1.531
Punctuation	9.385	11.846	1.417	1.737
Language Usage	6.231	9.231	1.365	2.198
Map Reading	9.308	10.692	1.654	.837
Graphs and Tables	7.384	8.000	1.196	.515
Reference Materials	12.847	16.692	1.943	1.943
Modern Math	13.538	11.308	2.398	.929
Arithmetic	10.077	7.923	1.665	1.294

[a]Fifth Grade Experimental Group

[b]Seventh Grade Experimental Group

Table 4

t Analysis of Combined Fifth and Seventh Grades Within the Control Group

Subtests	$\bar{X}^a$	$\bar{X}^b$	$S_{x_1-x_2}$	t-Value
Vocabulary	14.846	15.461	21240	.274
Reading	24.769	21.846	3.046	.959
Spelling	11.154	12.231	2.416	.446
Capitalization	13.000	9.077	1.638	2.395 *
Punctuation	10.308	12.200	1.585	1.194
Language Usage	9.462	8.846	1.448	.425
Map Reading	12.385	9.770	1.489	1.756
Graphs and Tables	9.154	6.385	1.326	2.088
Reference Materials	16.923	18.615	2.447	.691
Modern Math	12.462	13.154	1.809	.382
Arithmetic	9.462	9.154	2.438	.126

[a]Fifth Grade Control Group

[b]Seventh Grade Control Group

*Significant at .05 level

within the control group, t (11) = 2.395, $p < .05$, was observed. No statistically significant differences were found between the experimental and control groups at the fifth or seventh grade levels, t (11) = 2.196, $p > .05$, and t (11) = 1.765, $p > .05$, respectively.

Summary

The t-analysis for the eleven variables of the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964) produced data which indicated that the treatment of partially integrating exceptional children with normals through regular classes and the resource rooms had no significant statistical effect over a two-year period on academic achievement. The t-analysis also produced data indicating that this treatment held no significant differences, with the exception of the subtest, Capitalization, from full integration of the exceptional child with normals into regular classes.

Chapter IV

Summary, Discussion, and Recommendations

Summary

The purpose of this study was to ascertain if variables of academic achievement would extend the parameters of present knowledge concerning exceptional children in special and regular classroom placement. Thirteen exceptional children in grade five, and who were currently enrolled in special classes and regular classes, in a North Central Texas community were matched within the standard error of measurement obtained for each pupil, for Verbal and Nonverbal IQ's, as measured by the Lorge-Thorndike Intelligence Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964), with 13 students, who were fully integrated into regular classes and who had been diagnosed as exceptional, to formulate the control group. Five hypotheses were formulated concerning the efficacy of partial special class placement for exceptional children over a two-year period, as measured by the eleven subtests of the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964).

Hypothesis 1 suggested that no statistically significant differences in academic achievement gains between or among the experimental and control groups in the subtest of Vocabulary would be evident. Although a slightly significant difference did appear in favor of the fifth grade control group, t (11) = 2.239, $p < .05$, this did subside. No

statistically significant gains between the experimental and control groups or within the combined grades control group, t (11) = 1.145, $p > .05$, and t (11) = .274, $p > .05$, respectively, resulted from the comparison. Therefore, this significance of difference was assumed to have been to chance value, thereby support was given to the hypothesis of no effect (Sakoda, Cohen, & Beall, 1954).

Hypothesis 2 stated that no statistically significant difference of academic gain between or among the experimental and control groups in Reading would occur. There were no statistically significant differences, therefore this hypothesis was supported.

Hypothesis 3 stated that no statistically significant difference of academic gain between or among the experimental and control groups in the major area of Language, utilizing four subtests: Spelling, Capitalization, Punctuation, and Language Usage would occur. Capitalization produced a slightly significant gain within the control group, t (11) = 2.395, $p < .05$. No significant statistical differences were found between the experimental and control groups at the fifth or seventh grade levels, t (11) = 2.196, $p > .05$, and t (11) = 1.765, $p > .05$, respectively. No other statistically significant differences were obtained among these variables. Therefore the gain reported was assumed to have been to chance value and support was given to the hypothesis of no statistical difference (Sakoda, Cohen, & Beall, 1954).

Hypothesis 4 was supported by the t-analysis in that no significant statistical differences occurred in each of the three subtests of the majof area of Work-Study, including the subtests of Map-Reading, Graphs and Tables, and Knowledge and Use of References, between or among the experimental and control groups.

Hypothesis 5 indicated no statistically significant differences between the experimental and control groups, nor within the experimental or control groups in the four subtests of Arithmetic Concepts, Problem Solving, Modern Math, and Arithmetic Problems in the major area of Arithmetic. Therefore, the hypothesis of no effect was supported.

Discussion

The underlying purpose of this study was to test the assumption which has been increasingly made in the public schools of the United States by educators, that special class programs provided the most desirable educational setting for exceptional children. This study attempted to measure the extent of academic gain of exceptional children partially integrated with normals through the use of regular classes and special classes as determined by those exceptional children fully integrated into the mainstream with normals through the use of regular classes.

The total number of t-analyses which were produced in this study, shown in Tables 1, 2, 3, and 4, were 44, of which two or .05 percent were significant at the .05 level of

significance. In such a minimal number, it would be imprudent to surmise conclusions from the differences on these two variables, of which both were attributed to slight significance or chance value (Sakoda, Cohen, Beall, 1954).

The findings indicated no statistically significant differences in academic gain between the experimental and control groups on the variables assessed, as well as no statistically significant difference in gain within the experimental or control groups. Thereby, the treatment of partial integration of exceptional children with normals through the use of regular classes and special classes, had no statistically significant effect in academic achievement over a two year period.

Recommendations

On the basis of the findings of this study, the following recommendations for future research are suggested:

1. Because this study dealt with a limited population of exceptional children, it is recommended that further studies using the Lorge-Thorndike Intelligence Tests, Form 1 (Lorge, Thorndike, & Hagen, 1964) and the Iowa Tests of Basic Skills, Form 3 (Lindquist & Hieronymus, 1964) for obtaining matching and assessment variables, be used on a larger sample of exceptional children partially integrated into regular classes with exceptional children fully integrated into regular classes.

2. Research studies have not appeared in the literature

investigating academic gains and emotional lability between partially and fully integrated exceptional children with normal children, through the use of special and regular classes. Thereby, the efficacy of special class placement may be investigated further as measured by the Wechsler Scales, Illinois Test of Psycholinguistic Abilities, and the Bender-Gestalt Test of Developmental Maturity for Young Children.

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Appendix

Table 5

Raw Scores by Grades for the Control Group

on the Iowa Tests of Basic Skills

Subjects	Vocabulary	Reading	Spelling	Capitalization	Punctuation	Language	Map Reading	Graphs & Tables	Reference Mat'ls.	Modern Math	Arithmetic Pbms.
Fifth Grade											
1	20	44	18	23	12	4	16	8	26	12	6
2	16	25	5	6	5	6	9	3	14	9	7
3	19	20	10	15	13	13	16	7	15	14	5
4	11	28	6	6	7	10	16	12	19	7	8
5	14	24	6	15	5	4	9	7	18	11	5
6	11	11	5	6	8	3	7	6	6	6	36
7	11	11	10	13	11	10	16	8	21	13	5
8	16	17	3	18	6	17	5	19	4	20	13
9	14	17	14	11	12	10	9	9	11	12	14
10	9	25	21	18	10	9	10	13	20	25	6
11	20	36	15	11	19	18	12	5	9	13	4
12	16	32	21	14	14	12	19	13	32	13	7
13	16	32	11	13	12	7	17	9	25	7	7
Seventh Grade											
1	15	30	22	11	16	9	14	10	19	14	8
2	15	16	7	7	11	6	5	6	15	12	8
3	20	25	18	15	11	11	9	7	15	15	8
4	13	22	15	5	11	10	11	2	15	19	7
5	17	22	3	7	10	7	6	4	19	5	9
6	7	15	3	7	7	8	10	3	18	13	5
7	8	22	13	7	6	7	8	8	20	14	12
8	18	28	4	9	11	8	8	5	16	9	11
9	18	19	14	8	15	10	9	9	21	21	12
10	10	25	14	10	12	7	12	5	16	13	9
11	34	20	14	15	14	7	12	5	24	12	12
12	19	23	14	10	21	12	15	10	25	13	10
13	7	17	18	7	11	13	8	9	19	11	8

Table 6

Raw Scores by Grades for the Experimental Group on the Iowa Tests of Basic Skills

Subjects	Vocabulary	Reading	Spelling	Capitalization	Punctuation	Language	Map Reading	Graphs & Tables	Reference Mat'l.	Modern Math	Arithmetic Pbms.
Fifth Grade											
1	14	20	6	9	12	8	6	7	14	17	11
2	12	12	13	12	6	[illegible]	9	6	8	12	9
3	11	17	6	12	12	5	18	8	12	13	14
4	12	19	12	6	10	[illegible]	8	11	7	11	13
5	7	8	3	6	9	0	3	0	7	2	5
6	7	26	5	3	10	7	8	7	11	10	8
7	9	30	22	9	11	8	17	13	21	33	21
8	9	23	10	8	9	4	9	4	13	11	3
9	9	12	8	13	5	6	11	6	16	15	8
10	13	23	10	11	14	9	13	8	8	11	13
11	22	40	26	17	9	10	6	13	20	18	15
12	11	17	3	5	9	9	5	6	7	12	3
13	9	15	4	8	6	8	8	7	13	11	8
Seventh Grade											
1	5	31	8	14	11	7	20	8	19	11	8
2	12	19	10	11	13	4	4	9	10	10	7
3	14	16	4	10	5	10	15	10	19	11	7
4	11	27	8	11	12	11	13	11	14	11	13
5	5	19	9	10	9	8	11	11	11	9	10
6	13	24	10	13	10	8	9	6	28	13	9
7	15	21	5	12	14	7	10	5	11	15	10
8	8	21	8	17	23	7	7	8	24	12	2
9	23	24	18	16	11	18	12	9	15	11	4
10	12	26	9	9	12	11	8	10	14	11	4
11	16	18	13	13	16	6	9	9	16	9	11
12	16	26	8	5	11	6	11	4	18	12	9
13	15	19	12	6	7	7	10	4	18	12	9

Table 7

Lorge-Thorndike Matched Experimental and Control Groups

Subjects	RS	Verbal	RS	Nonverbal	Verbal SE_m Span	Nonverbal SE_m Span	Matched Verbal	Matched Nonverbal
1	24	84	34	98	78-90	93-103	81	95
2	19	78	16	77	72-84	70- 84	72	83
3	49	94	24	87	89-99	81- 93	95	82
4	30	80	20	81	75-85	75- 87	79	81
5	17	70	16	74	64-76	68- 80	74	69
6	21	73	24	82	67-79	76- 88	74	83
7	16	71	17	77	65-77	71- 83	69	82
8	23	76	16	74	70-82	68- 80	70	72
9	23	78	26	88	72-84	83- 93	80	90
10	36	89	39	101	84-94	96-106	85	102
11	40	97	23	91	92-102	85- 97	96	96
12	32	84	30	91	79-89	86- 96	81	88
13	17	80	20	86	74-86	80- 92	79	85