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AN ANALYSIS OF HETEROGENEOUS AND ACHIEVEMENT GROUPING AMONG AN EXPERIMENTAL GROUP OF NINETY STUDENTS IN THE LOS ALAMOS, NEW MEXICO, SCHOOLS

By

Gene Howard Ebinger

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts in School Administration

The University of New Mexico

1960

This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

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TABLE OF CONTENTS

CHAPTER PAGE

I. THE PROBLEM AND DEFINITIONS OF TERMS USED 1

The Problem. 3

Statement of the problem. 3

Limitation of the problem 4

Importance of the problem 5

Definitions of Terms Used. 6

Achievement grouping. 6

Heterogeneous grouping. 6

Experimental group. 6

Rate of academic growth 7

Sources of Data. 7

Method of Procedure. 7

II. ACHIEVEMENT GROUPING AS VIEWED BY THE EXISTING LITERATURE . 9

Functions and Objectives of Grouping 10

Development of Grouping. 12

Types and Methods of Grouping. 13

Heterogeneous grouping. 13

Ability grouping. 15

Achievement grouping. 17

Other types of grouping 18

III. COMPILATION AND ANALYSIS OF DATA. 21

The Experimental Group 21

264279

CHAPTER PAGE

Group I. 22
Group II 22
Group III. 22
Section P. 23
Section M. 23
Section C. 23
Factors Which May Have Had Some Influence on Test Results 23
The modified Joplin Reading Plan 24
Teacher attitude 25
Statistical Data. 28
Summary 83
IV. CONCLUSIONS AND RECOMMENDATIONS. 85
Conclusions 85
Recommendations 88
BIBLIOGRAPHY. 90
APPENDIX. 94

LIST OF TABLES

TABLE PAGE

I. Achievement Levels by Subject Made by All Students from October, 1958, to April, 1960 30

II. Achievement Levels Scored by All Groups in a Two Year Period. 33

III. Grade Placement of All Students in the Experimental Group from October, 1958, to April, 1960. 36

IV. Achievement Levels by Subject Made by Group I from October, 1958, to April, 1959. 39

V. Achievement Levels by Subject Made by Group I from October, 1959, to April, 1960. 42

VI. Grade Placement of Group I from October, 1958, to April, 1960. 45

VII. Achievement Levels by Subject Made by Group II from October, 1958, to April, 1959 54

VIII. Achievement Levels by Subject Made by Group II from October, 1959, to April, 1960 57

IX. Grade Placement of Group II from October, 1958, to April, 1960. 60

X. Achievement Levels by Subject Made by Group III from October, 1958, to April, 1959 69

XI. Achievement Levels by Subject Made by Group III from October, 1959, to April, 1960 72

XII. Grade Placement of Group III from October, 1958, to April, 1960. 75

LIST OF FIGURES

FIGURE PAGE

1. Achievement by Subjects of All Students from October, 1958, to April, 1960 31
2. Achievement Gains Made by All Groups in a Two Year Period. . 34
3. Grade Placement of All Students in the Experimental Group from October, 1958, to April, 1960 37
4. Achievement Rates by Subject Made by Group I from October, 1958, to April, 1959 40
5. Achievement Rates by Subject Made by Group I from October, 1959, to April, 1960 43
6. Grade Placement of Group I from October, 1958, to April, 1960 46
7. Growth by Grouping Experience Compared with the Expectancy Tables for Group I, Section C, from October, 1958, to April, 1960. 48
8. Growth by Grouping Experience Compared with the Expectancy Tables for Group I, Section M, from October, 1958, to April, 1960. 50
9. Growth by Grouping Experience Compared with the Expectancy Tables for Group I, Section P, from October, 1958, to April, 1960. 52
10. Achievement Rates By Subject Made by Group II from October, 1958, to April, 1959 55

FIGURE PAGE

11. Achievement Rates by Subject Made by Group II from October, 1959, to April, 1960 58

12. Grade Placement of Group II from October, 1958, to April, 1960 61

13. Growth by Grouping Experience Compared with the Expectancy Tables for Group II, Section C, from October, 1958, to April, 1960. 63

14. Growth by Grouping Experience Compared with the Expectancy Tables for Group II, Section M, from October, 1958, to April, 1960. 65

15. Growth by Grouping Experience Compared with the Expectancy Tables for Group II, Section P, from October, 1958, to April, 1960. 67

16. Achievement Rates by Subject Made by Group III from October, 1958, to April, 1959 70

17. Achievement Rates by Subject Made by Group III from October, 1959, to April, 1960 73

18. Grade Placement of Group III from October, 1958, to April, 1960 76

19. Growth by Grouping Experience Compared with the Expectancy Tables for Group III, Section C, from October, 1958, to April, 1960. 78

20. Growth by Grouping Experience Compared with the Expectancy Tables for Group III, Section M, from October, 1958, to April, 1960. 80

FIGURE PAGE

21. Growth by Grouping Experience Compared with the Expectancy Tables for Group III, Section P, from October, 1958, to April, 1960. 82

CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Education must be both conservative and liberal in its makeup and method; conservative in that it does not hasten to throw aside old policies and beliefs simply because they are old, and liberal in that it must be flexible enough to make way for changes and new ideas. In education, then, the new and the old must be tested, sometimes the one against the other, sometimes the one complementing the other. After exhaustive testing, the relative merits must be weighed, sifted, discarded, shuffled, and rearranged.

In a study of the history of public education, many changes in policy, method, and points of emphasis can be observed. One thing remains constant, however: the aim and end of public education has been to teach each child committed to its care to the highest degree possible.

This potential of learning varies with each child. It varies with different fields of study for a given child. It varies with teachers, with schools' physical plants, perhaps even with the weather. The goal remains, nevertheless, to serve each student in an individualized manner.

To achieve this goal most effectively, many plans have been devised. Some have been used with varying degrees of success for many years. Others have been tried and then discarded; some have been brought back for a re-trial, and others remembered only as

mistakes. The obvious difficulty often has been that there are too many children assigned to one teacher in one classroom for a strictly individualized program of education.

It is clearly evident, then, that students must be grouped in one way or another. Shall thirty students be assigned in alphabetical order to each teacher? Shall the pupils be divided by sex? Shall they be shuffled to the various teachers like a deck of cards? Shall they be divided according to their various interests in the arts and sciences? Shall they be grouped according to their tested intelligence quotients?

All of these methods of division or grouping, and many others, have been used. Probably without exception each was decided upon by some educator as the best way to attempt to educate each child to his highest potential. Some of the methods seem almost ludicrous at first thought. What methods are better?

This study is based on the hypothesis that children make greatest individual progress under a system of achievement grouping. Such a plan is not to be confused with ability grouping. When children are grouped according to their achievement, it is possible, and even likely, for a child of low average ability to be in the same group with children of great ability because he is achieving at a high rate.

In 1957, with the stated purpose of serving every child as completely as possible, in one elementary school of Los Alamos, New Mexico, second- and fourth-graders were divided into three

sections each, the division being based on achievement test results as shown by the pupils' previous records. The experiment proved hopeful. During the following year, 1958-59, largely because of the academic growth made by these approximately one hundred and fifty elementary students, achievement grouping was established in most of the other elementary schools in Los Alamos. In 1959-60 this method of grouping was being used in all but one elementary school in Los Alamos. The single school in which achievement grouping was not used experimented instead with a reading plan similar to the Joplin Plan. Since some of the students in the experimental group for this investigation came from the school not using achievement grouping, further mention has been made of the experimental reading plan later in this study.

I. THE PROBLEM

Statement of the problem. The purpose of this study was to determine the effects of achievement grouping on an experimental group of students and to compare the rate of academic growth between children grouped by achievement and children grouped heterogeneously during the school years 1958-59 and 1959-60 in certain elementary schools of Los Alamos, New Mexico. Answers were sought for the following questions:

1. Was there a noticeable difference in rate of academic growth between students with one year of achievement grouping experience and those with no achievement grouping experience? Between those with one year and those with two years of achievement grouping experience? Between those with two years and those with no achievement grouping experience?

2. Was there evidence that achievement grouping contributed substantially to the overall rate of academic growth? Did achievement grouping seem to contribute most to growth in one area over growth in another?

3. Did pupils of any one intelligence quotient range profit more, or less, from achievement grouping than did the others?

Limitation of the problem. The findings of the study have come from results recorded from the administering of Mental Maturity and Achievement Tests[1] to ninety elementary pupils in Los Alamos schools. Testing periods were October, 1958, April, 1959, October, 1959, and April, 1960.

The experimental group of ninety was selected in the following manner: thirty children were selected from an elementary school where they have been grouped by achievement for the school years 1958-59 and 1959-60; thirty were from an elementary school where they have been grouped for the school year 1959-60 according to their achievement; thirty were chosen from an elementary school where they have had no achievement grouping experience.

The groups were further sub-divided so that ten in each of the three aforementioned groups have recorded I. Q.'s of 126 and above; ten in each group fall in the I. Q. range of 109-125; and ten in each group are 108 I. Q. and below. All students were third-graders in 1958-59 and fourth-graders in 1959-60. Their chronological ages ranged from 111 to 122 months at the time of the final testing.

---

[1] California Mental Maturity Tests and California Achievement Tests (Los Angeles, California: California Test Bureau)

The study has been limited to the purely objective test results of the experimental group. This study has not attempted to measure various other factors involved in the students' lives, such as health, social relations, home environment. Also no allowance has been made for the individual teachers involved and their relative abilities to teach. It is recognized that such things do enter into the rate of academic growth, but it is also suggested that a study of these factors would produce a greater degree of subjectivity than the value such a measurement might contribute. More will be said, however, concerning teacher attitude toward achievement grouping.

Importance of the problem. The public schools have been the target for many attacks by laymen, particularly in the past few years. Some attacks have been made perhaps with some justification. It is probable, for instance, that most teaching was directed to the average child, with both the gifted and the slow-learner being, to some extent, neglected and left to "sink or swim" by himself. It is plain to the observer that such a situation is almost inevitable when one teacher is assigned a group of thirty or more students whose native abilities are likely to range from very high to very low.

It is likely that educators, as well as most laymen, are united in the thought that the greatest single resource of the United States is an educated populace. If the situation that produces anything less than the best possible education for our children can be changed, then the schools must assume the responsibility for

such a change. If highly gifted minds, particularly, are being wasted by low standards, a real tragedy is occurring, and educators must expend every effort to counteract it.

If achievement grouping is a step forward, even though it might not be the total answer, the importance of this study becomes obvious. If achievement grouping is not a move toward the answer, the study is important in bringing pertinent evidence to light.

This problem is important in that it may help to show whether or not achievement grouping gives evidence of providing a means of training all children to the highest degree possible according to their individual potentials.

II. DEFINITIONS OF TERMS USED

Achievement grouping. Achievement grouping is a method of dividing students into groups according to what test results show they have accomplished in academic studies.

Heterogeneous grouping. Heterogeneous grouping is a division of students made without regard to their similarities in academic achievement. The principal likeness among students in heterogeneous grouping is in a relative similarity of chronological ages.

Experimental group. The experimental group is an objectively chosen number of students as a group with certain given properties. It serves as a tested group to prove or disprove a hypothesis. In this study the given properties are intelligence quotients,

chronological ages, amount of experience in classes grouped according to achievement. In addition, all members of the experimental group have been enrolled at least three years in the Los Alamos schools.

Rate of academic growth. Rate of academic growth is the speed at which a student progresses in learning. This is shown generally by test results.

III. SOURCES OF DATA

Intelligence quotients were obtained from California Mental Maturity Tests, and achievement results were obtained from California Achievement Tests. The tests were given to Los Alamos, New Mexico, elementary school students.

IV. METHOD OF PROCEDURE

Using cumulative records, this investigator chose, from among students who had been in the Los Alamos elementary schools for at least three years, ninety students, thirty in each of the following I. Q. ranges: 126 and above; 109-125; 108 and below. Each group of ninety was further divided so that ten students had had two years of achievement grouping; ten students had had one year of achievement grouping; and ten students had had no achievement grouping experience.

The investigator then examined achievement test results in reading and arithmetic for each individual in the experimental group as a third-grader in 1958-59 and as a fourth-grader in 1959-60.

Language test results were noted in 1959-60 only since fourth-grade is the earliest time that such tests are given. Charts and graphs showing the rate of growth for each group were then prepared.

Finally comparisons were made among the groups to determine the rate of academic growth of each division and for each subject area tested. From these results conclusions were drawn concerning the validity of achievement grouping.

CHAPTER II

ACHIEVEMENT GROUPING AS VIEWED BY THE EXISTING LITERATURE

In a vast amount of writing on the subject of grouping of students, educators seem to be agreed upon only one important point: grouping is not only necessary; it is inevitable. This chapter presents some typical points of view concerning the objectives of grouping, its development, and some of the more widely-used types of grouping.

Karnes has written in a recent educational journal as follows:

> Narrowing the range of abilities in a given classroom is essential. It is easy to give lip service to the philosophy of meeting the needs of every child in the classroom. However, it is extremely difficult to put this philosophy into practice if a teacher is given 35 children who range in mental ability from the mentally retarded to the very gifted, particularly when some of them have other problems of a physical or emotional nature.
>
> No matter how sensitive the teacher is to individual differences and how competent he is to meet the needs of individuals, he sometimes finds himself in a situation where it is humanly impossible to do so.[1]

Otto sums up the need for grouping in three compact statements: first, there are more pupils than teachers; second, children must be provided with "many kinds of experiences in many kinds of

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[1]Merle B. Karnes, "The Slow Learner," NEA Journal, XLVIII (October, 1959), 22.

situations," and finally, the nature and interest of the individual child must be provided for.[2]

Here, however, agreement ends. Types and methods of grouping are legion, and their individual proponents are not reluctant to state the advantages of their plans and the disadvantages of all others. Many of the types of grouping differ radically from each other; many more have differences so slight as to be almost negligible.

Much has been written on grouping within the classroom as well as total grouping for a whole grade level. In some instances the principles for the two processes are the same, and where this occurs, no distinction is made in this study of the literature as to whether reference is made to intra-classroom grouping or entire grade level grouping.

I. FUNCTIONS AND OBJECTIVES OF GROUPING

Interestingly, the same functions and objectives of grouping are cited by the advocates of the varying forms of grouping. "To place each child in a school situation which will provide the fullest opportunities for educational growth" is the end and aim of grouping, state one set of authors,[3]

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[2]Henry J. Otto, Elementary School Organization and Administration (New York: Appleton-Century-Crofts, Inc., 1954), pp. 166-167.

[3]James Henry Dougherty, Frank H. Gorman, and Claude A. Phillips, Elementary School Organization and Management (New York: Macmillan Co., 1936).

Smith and Dolio say essentially the same thing:

> Grouping should place each individual within a group in which he will work better, where he will have a sense of belonging and status, where his mental health will be safeguarded and improved.[4]

Woodring writes, "Individual differences exist in nature and are not to be obliterated by ignoring them."[5] Three quotations from Otto are offered to continue this same line of thought in a somewhat amplified wording:

> A school's grouping practices should encourage optimum development of each child rather than create an influence which would make for uniform achievements and thus tend to keep children more nearly alike in the traits whose development are sought by the school. There is no evidence that conformity to averages is a desirable or possible goal of instruction.[6]

> A general view of the purposes of education in American democracy suggests that methods of grouping pupils in school should be consistent with the basic philosophy of American culture. The goal of the individual is self-realization in a democratic society.[7]

> If the school's objective centers primarily upon promoting achievement in the academic fields with little or no concern for children's physical, social, and emotional development, then the objective in grouping can be to assemble into class sections children who are as nearly alike as the circumstances will permit in academic attainments.[8]

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[4]Othanel Smith and A. J. Dolio, "Recent Developments in Grouping--A Minimum Bibliography," Educational Leadership, IV (March, 1947), 403.

[5]Paul Woodring, A Fourth of a Nation (New York: McGraw-Hill Book Company, Inc., 1957), p. 132.

[6]Otto, op. cit., p. 199.

[7]Ibid., p. 170.

[8]Ibid., p. 193.

The Educational Policies Commission of the National Education Association lists four points as basic criteria for placing an individual in a group: (1) he is wanted and accepted by the children; (2) he may excel and be excelled within the group; (3) he has tasks with a reasonable chance for success; and (4) he experiences "interplay with the group so that there may result wholesome personality and social development."[9] They further state:

> The school will have discharged its responsibility if it makes sure that it has done everything within its power to help each child each day and each year to grow and to develop toward the purposes of education as much as his talents and capabilities permit.[10]

III. DEVELOPMENT OF GROUPING

One authority states that the chief difference between early American school grouping and modern grouping lies in its social significance. In colonial times children were classified socially, being trained for the "learned professions on the basis of ability, family circumstances, social inheritance." The modern view is that grouping is engaged in solely for the purpose of improving the learning situation.[11]

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[9] Education for All American Children. A Report Prepared by the Educational Policies Commission of the NEA and AASA. (Washington: NEA of the United States, 1948).

[10] Ibid., pp. 17-18.

[11] Dougherty, et al, op. cit., p. 250.

Briggs writes of the earliest attempts at changing American education from the individualized method to the group method in 1800. He cites the Cambridge and Santa Barbara Plans as pioneers in ability and achievement grouping in an attempt to meet individual needs within the group more adequately.[12]

The Cambridge Plan set about to classify and group students as fast learners or average learners. The latter group pursued a course which used six years in completing the work of grades 4-9; the fast group was "put over the same course in four years."[13]

The Santa Barbara Plan divided each group into three sections, recognizing the varying capacities of the students, "but instead of adjusting to them through rapid promotions, it provided more extended and richer experiences for the more able pupils."[14]

III. TYPES AND METHODS OF GROUPING

Heterogeneous grouping. Elsbree and McNally name four advantages of random or heterogeneous grouping as opposed to any type of homogeneous grouping: (1) different personality types are thrown together; (2) children may learn from other children as well as from

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[12]Thomas Briggs, Laboratory Techniques of Teaching, Bureau of Publications, Teachers College, Columbia University (New York: Columbia University Press, 1938), pp. 4-11.

[13]Ibid.

[14]Ibid.

the teacher; (3) learning is not so likely to be limited to subject matter alone; and (4) this type grouping is a more realistic preparation for life.[15]

These advantages appear to be somewhat ambiguous, for, with the possible exception of the fourth mentioned above, they seem equally applicable to any type grouping or non-grouping. More will be said concerning the fourth point later in this study.

A strong contender for heterogeneous grouping states that:

> Beyond this basis of broad common interest and concern, differences in abilities and in aptitudes are desirable rather than undesirable, for a condition should exist in which varied contributions are made to the life of the group and in which leadership and fellowship shift from person to person as new situations develop, just as they do in normal life situations.[16]

This writer does add, however, that grouping should be somewhat homogeneous when concerned with maturity, friendships, and behavior problems of the individual children.

Heterogeneous grouping is a more normal situation, another educator writes, than any form of homogeneous grouping. A child,

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[15]Willard S. Elsbree and Harold J. McNally, Elementary School Administration and Supervision (New York: American Book Company, 1951), pp. 120-129.

[16]Hollis L. Caswell and A. W. Foshay, Education in the Elementary School (New York: American Book Company, 1957), pp. 343-344.

selected at random for a group, works with children of all degrees of ability and is able to realize the different types of contributions that people make to society.[17]

The one nod to homogeneity made by another set of authors was in chronological age.[18] They felt that all children of the same age should be evenly distributed into the necessary number of sections with no regard being given to the range of abilities.

Ability grouping. Elsbree and McNally write strongly against ability grouping which is decided on the basis of I. Q. alone.[19] Otto writes that it is not a feasible plan unless subject matter mastery is the only educational aim.[20]

Defined by Otto as "the practice of segregating the children of a given grade or age group into groups according to ability," this plan was begun in the 1920's in an effort to meet individual differences.[21]

Another writer lists three difficulties with ability grouping: (1) children and parents feel a certain stigma attached to the "low"

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[17]Arthur E. Hamalainer, "Method of Grouping Pupils Should Provide Normal Social Situations," The Nation's Schools, XLV (June, 1950), 34-35.

[18]Albert H. Shuster and Wilson F. Setzler, Leadership in Elementary School Administration and Supervision (Boston: Houghton Mifflin Company, 1958), p. 311.

[19]Op. cit., pp. 129-140.

[20]Op. cit., p. 175.

[21]Ibid., p. 151.

group; (2) teachers are reluctant to accept the responsibilities and other aspects of the "low" group; and (3) some critics of the system say that pupil interest and motivation do not receive sufficient consideration.[22]

A well-written statement citing alleged undemocratic procedures in ability grouping follows:

> If one holds that uniformity of ability and achievement within an instructional group is a desirable condition of education and a goal for further activities, he will support ability grouping. If, in contrast, he believes that diversity and uniqueness are essentials of stimulating educational experiences and that differences are fostered by education, he will consider ability grouping unsound. If one views the democratic process as one which permits the able to rise through their individual efforts to positions of power and leadership and which conditions the less able to acceptance of such leadership, he will support ability grouping. However, if the democratic process is considered one in which real respect for the personality of every person is basic, with leadership resting on the participation of all and shifting from situation to situation, ability grouping will not be accepted.[23]

In an opinion poll conducted among a group of school administrators by an educational journal, it was found that 40.3% favored ability grouping so that more attention could be given to the gifted children. Voting against ability grouping were 59.2% who, generally, had no objection to ability grouping within the classroom but feared the "friction" that ability grouping might cause. The general

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[22]Mary Jane Loomis, "The Right Child in the Right Classroom in the Elementary School," NEA Journal, XLVIII (September, 1959), 18.

[23]Shuster and Setzler, op. cit., pp. 339-340.

feeling seemed to be that the solution could come only when this basic question was answered: Are academic or social problems of more importance?[24]

Paul Woodring, in defending ability grouping, writes as follows:

> It is as though we taught high jumping by placing the bar at 3 feet and asking everyone in the class to jump until he succeeded in getting over it. Those who succeed, but with difficulty, will find this a well-motivated learning experience. Those for whom the jump is impossible will be frustrated and will feel inferior. But what about those who are capable of learning to jump 5 or 6 feet?[25]

Feeling that non-ability-grouped teaching is detrimental to the brighter children, Woodring adds:

> When a teacher is faced with thirty-five or forty students of widely varying capacities for learning, he is very likely to address his efforts to the middle group or to a hypothetical point somewhat below the middle.[26]

Achievement grouping. This plan offers less literature than the preceding methods of grouping. It has been practiced to some degree for several decades, but there is much disagreement as to the methods of pupil selection, aims, and results. Otto cautions:

> Children should not be placed in terms of their achievement status if by so doing the child would be confronted with unsurmountable obstacles to wholesome social, emotional, personality, and character development.[27]

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[24] "Opinion Poll," The Nations' Schools, LVI (November, 1955), 6.

[25] Op. cit., p. 130.

[26] Ibid., p. 128.

[27] Op. cit., p. 193.

Concerning the advantages of achievement grouping for the gifted children, another author writes thus: "Gifted children respond well to grouping. In the company of other bright, zealous youngsters, incentive to grow in knowledge, understanding, and skill is enhanced."[28]

In a recent study of achievement grouping tried by the schools of Tampa, Florida, the astounding progress of from 14 to 54 months growth was noted, with medians showing more than 20 months. Concerning particularly the average and slow groups, the teachers noted that the children seemed happy and that they were working nearer their capacities than they had in traditional grouping. Besides learning the fundamentals better, these children had opportunities for social and civic responsibilities that frequently had been enjoyed only by children of greater ability than themselves. There appeared to be no feelings of inferiority and superiority. "They gained self-confidence that came from achievement on a level with their peers and from a campaign of personal growing."[29]

Other types of grouping. Although they will not be discussed separately in this study, various other types of grouping should be mentioned. Some writers, opposed to grouping in other forms, favor

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[28]William M. Cruickshank and G. Orville Johnson, eds., Education of Exceptional Children and Youth (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958), p. 164.

[29]Fay C. Riley, "Grouping Gives Each Child a Chance," The Nation's Schools, LXI (November, 1958), 60.

grouping according to reading ability.[30] This type of classification in intra-classroom situations is almost universally practiced. Bond and Handlan say that teachers who want to individualize instruction have long grouped their pupils within the classroom according to their reading ability, making very certain, however, that the groups are always highly flexible in size and in personnel.[31]

Ungraded grouping is a plan practiced rather widely in many forms. This plan is established originally on the basis of mental maturity tests given to the children in kindergarten. Each year, however, new tests are given, and teacher evaluation is considered in an attempt to make the grouping more flexible. Each child proceeds at his own pace, with no skipping or repeating of any part of the program.[32] The Detroit Plan and the Winnetka Plan are rather well-known forms of ungraded grouping. An advantage of such a system is that progressing at his own rate assures maximum achievement of the individual. It is pointed out, however, that such a plan makes no real adjustment to any individual differences other than rate of learning. In this program superior students spend less time than

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[30]William B. Ragan, Modern Elementary Curriculum (New York: The Dryden Press, Inc., 1953), p. 253.

[31]Guy L. Bond and Bertha Handlan, Instruction in Reading (Minneapolis: University of Minnesota Press, 1948), p. 13.

[32]Ibid.

[33]Caswell and Foshay, op. cit., pp. 337-338.

normal on basics, and slow students spend more, with each child progressing at his own pace.

The same essential plan as ungraded grouping, but calling itself by another name, is multiple-track grouping. An interesting development in this plan is occurring in the Washington, D. C., schools, under the direction of Superintendent of Schools, Carl Francis Hansen. In this four-track grouping system students are divided into four sections at the third-grade level on the basis of "ability and motivation." These sections continue throughout elementary and secondary school. The upper group is composed solely of those with I. Q.'s higher than 120 and is given an "honors" course from the third-grade on. The second group is generally of potential college ability. Group three is low average but should be able to finish high school. The fourth group is composed of slow learners who need much remedial help.[34]

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[34]"First Things First," Time, LXXV (February 1, 1960), 64.

CHAPTER III

COMPILATION AND ANALYSIS OF DATA

This chapter presents a series of tables and figures which have been designed to show comparisons of academic growth among students with two years of achievement grouping experience, students with one year of achievement grouping experience, and students with no achievement grouping experience. An explanatory page accompanies each table and figure.

It should be noted here that 3.3% of the students tested at the beginning of the experiment had moved from the Los Alamos school system before the final testing period. The results of their tests are included in all testing periods except the final one.

This study follows the example of the California Achievement Tests in figuring the school year on a ten month basis rather than on twelve months. This plan assumes that the normal student will make one month's academic growth for each month of the school year and one month's academic growth for the three months of summer vacation. Therefore, in the chapter the figure 1.5, for example, representing one and five-tenths years, should be considered not as eighteen months but as a fifteen months period.

I. THE EXPERIMENTAL GROUP

The experimental group for this study consisted of ninety elementary school students in the Los Alamos, New Mexico, public schools.

All students were third-graders in 1958-59 and fourth-graders in 1959-60. Their chronological ages ranged from 111 to 122 months at the time of the final testing, which was in April, 1960. Other testing times were October, 1958, April, 1959, and October, 1959. Subjects tested were reading and arithmetic in 1958-59 and reading, arithmetic, and language in 1959-60. On the figures one will note the academic growth in these subjects individually as well as an illustration of composite growth.

For purposes of the experiment, the group of ninety was divided into three groups of thirty each, labelled here as Groups I, II, and III, according to their intelligence quotients. They are labelled sections P, M, and C according to the amount of their achievement grouping experience.

Group I. Group I consists of thirty students whose I. Q.'s are 126 and above, according to California Mental Maturity Tests administered to the students when they were first-graders. No I. Q. is higher than 160, and the average I. Q. is 141.

Group II. Group II consists of thirty students whose I. Q.'s fall in the range of 109-125, according to California Mental Maturity Tests administered to the students when they were first-graders. The average I. Q. for this group is 120.

Group III. Group III consists of thirty students whose I. Q.'s are 108 and below, according to California Mental Maturity Tests

administered to the students when they were first-graders. No I. Q. falls below 91; the average I. Q. of this group is 99.

Section P. Section P is a division of the experimental group representing those thirty students who have had no achievement grouping experience. It is composed of ten students from each of Groups I, II, and III. It is represented on the figures by a bar with diagonal lines.

Section M. Section M is a division of the experimental group representing those thirty students who have had one year of achievement grouping experience. It is composed of ten students from each of Groups I, II, and III. It is represented on the figures by an unshaded bar.

Section C. Section C is a division of the experimental group representing those thirty students who have had two years of achievement grouping experience. It is composed of ten students from each of Groups I, II, and III. It is represented on the figures by a shaded bar.

II. FACTORS WHICH MAY HAVE HAD SOME INFLUENCE ON TEST RESULTS

The investigator chose the experimental group with complete objectivity. The numerical test results would indicate further objectivity. Two factors, however, which may have tended to reduce the degree of scientific accuracy of the comparisons should be

mentioned here: (1) the modified Joplin Reading Plan used with one section and (2) the attitude of the teachers who were teaching the classrooms grouped according to achievement.

As was stated in Chapter I, most factors entering into students' rates of academic growth which imply a high degree of subjective investigation (such as health, social relations, home environment) were not allowed for in this study. However, because of the special nature of the modified Joplin Reading Plan and its possible influence on one of the sections, and because of the extreme importance of individual teachers in any classroom situation, these two factors would bear some investigation.

The modified Joplin Reading Plan. Section P, the thirty students who have had no achievement grouping experience, divided equally among Groups I, II, and III according to I. Q. range, were subjected to another type of grouping experience in 1959-60 which may or may not have influenced their rates of academic growth as they appear on the figures and tables. Although the students of this group were heterogeneously grouped in their classrooms, they were subjects of an experiment in a modified form of the Joplin Reading Plan. This plan, briefly, was carried out in the following manner: fourth-, fifth-, and sixth-grade pupils were divided into five sections for formal reading instruction with no attempt being made to keep grade levels intact. The preliminary division was made on the basis of achievement test scores. Concerning the advantages of this program, the principal

of the school which was involved in this experiment writes as follows:

> Generally speaking it appears that pupils in the middle and upper range have shown more progress under this form of grouping. The lower range students in some instances have shown, relatively speaking, fine progress. This may have developed in spite of our program, or because of the program.[1]

Teacher attitude. It is reasonable to expect that the success or failure of an achievement grouping experiment or any other educational experiment would depend to some extent on the attitudes of the indivudual classroom teachers involved. Because of this, elementary teachers were asked to evaluate achievement grouping as practiced in the Los Alamos schools. The following questions were asked in a questionnaire:

> 1. In comparison to unselected or heterogeneous grouping how do you rate our achievement grouping? Better? Not as good? About the same?
>
> 2. In regard to academic problems, grouping has resulted in more problems, less problems, or about the same number of problems?
>
> 3. Our program has resulted in greater, lesser, or about the same amount of social and emotional problems for children?
>
> 4. Have you changed your attitude about grouping since we began this experiment? Very little? Much? Not at all?
>
> 5. Would you definitely prefer one group over another? If yes, which group?

Fifty-three teachers answered the first question. Of this group thirty-seven felt that achievement grouping was better than

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[1] George Joyce, "Teacher Evaluation of Modified Joplin Reading Program" (unpublished report to Dr. C. W. Richard, Los Alamos, New Mexico, May, 1960).

heterogeneous grouping, eight felt that it was not as good, and eight felt that it was about the same.

Fifty-four teachers answered the second question. Six thought that achievement grouping had resulted in more academic problems; thirty-one felt that it had resulted in fewer academic problems; and eighteen felt that it had resulted in about the same number of academic problems.

Of the fifty-one who replied to the third question, fourteen felt that grouping had created greater social and emotional problems; nine thought that it had created fewer social and emotional problems; and twenty-eight thought that social and emotional problems remained at the same level in achievement grouping.

Fifty-one answered the fourth question. Thirty-six replied that their attitude toward this type of grouping had changed very little; five said that their attitude had changed much; and ten replied that their attitude had changed not at all.

Of the fifty-three teachers who answered the last question, thirty-seven expressed a definite preference to one group over another, and sixteen said that they had no preference. Eighteen chose the high group as the one they would prefer to teach; eight chose the middle group; and eleven chose the low group. One teacher suggested that teachers should rotate each year in teaching the various groups.

The teachers themselves suggested the following strengths of achievement grouping:

1. The teacher could proceed at a rate more suitable to the students.

2. The slower groups had a more secure feeling.

3. Fewer, if any, students were neglected in areas where they needed help.

4. Better achievement was attained for all groups.

5. Much time could be given to enrichment plans for the gifted.

6. A teacher's planning should be easier and teaching more effective.

7. The fear was lessened that the advanced students were being held back because of the slow learners or that work was progressing too rapidly in order for the slow learners to keep up with the more advanced students.

8. Slower groups could be taught more thoroughly.

9. More challenge was evidenced in the upper groups.

10. In the high groups pupils could work for longer periods of time.

11. Basic drill was applicable to almost the entire group.

12. The range of ability was narrow, therefore allowing for mutual exchange of ideas and understanding among members of the group.

13. Slower students had a greater chance for leadership.

Weaknesses noted by the teachers included the following:

1. The range of individual differences was not cut nearly so much as had been expected.

2. Teachers had to guard against becoming boring and dull and against developing a group complex.

3. In many instances social, emotional, academic, and discipline problems were more heavily concentrated in one group.

4. Some personalities within the groups needed to be separated, but there were no other groups on their academic level.

5. Children with lesser abilities did not profit from the ideas of above average peers.

6. Social contacts were minimized by the children of different groups.

7. It was more difficult to keep up the enthusiasm in the low groups.

8. Children missed the association and learning to get along with children of many intelligence levels.

9. The number of boys and girls in a class may be very uneven.

10. Lower groups had fewer leaders in any phase of school life.

III. STATISTICAL DATA

Figure 1 illustrates the academic growth in months over a period of two school years (October, 1958-April, 1960). Test results for Groups I, II, and III (groups based on I. Q. range) were averaged together so the figure could show total growth by subject.

The group division is made on the basis of achievement grouping experience. Section M, represented by an unshaded bar, shows the thirty students of all I. Q. levels with one year of achievement grouping experience. Section P, represented by a bar with diagonal lines, represents the thirty students of all I. Q. levels with no achievement grouping experience. The shaded bar denotes Section C which includes thirty students of all I. Q. levels who have had two years of achievement grouping experience.

Section C, as shown in the figure, ranks consistently higher than Sections M and P in both subjects tested and in the composite score. Section M shows a greater growth in arithmetic than Section

P_3 but it is slightly lower in reading and in the composite growth. The growth of Section P over Section M in reading may be due to the reading program used by Section P and described earlier in this chapter.

The broken line at 1.5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 1 is shown in Table I.

TABLE I

ACHIEVEMENT BY SUBJECT MADE BY ALL STUDENTS
FROM OCTOBER, 1958, TO APRIL, 1960

		READING	ARITHMETIC	COMPOSITE
SECTION C	Group I	2.7	2.8	3.07
	Group II	2.9	2.9	3.1
	Group III	2.7	2.6	2.7
	Average	2.8	2.8	2.99
SECTION M	Group I	2.6	2.6	2.6
	Group II	2.7	2.5	2.4
	Group III	1.6	1.7	1.5
	Average	2.3	2.3	2.2
SECTION P	Group I	2.8	2.1	2.4
	Group II	2.6	2.3	2.4
	Group III	2.2	2.1	2.1
	Average	2.5	2.2	2.3

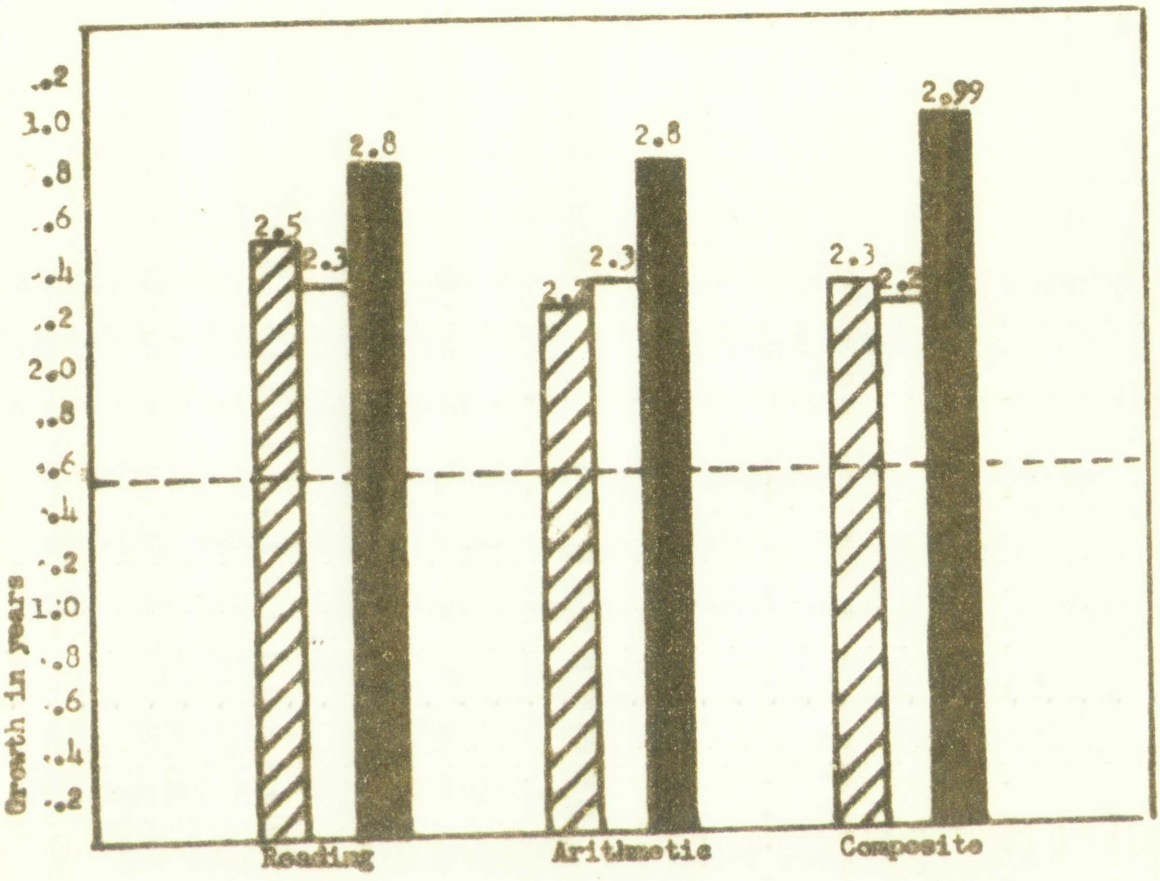

FIGURE I

ACHIEVEMENT BY SUBJECTS OF ALL STUDENTS
FROM OCTOBER, 1958, TO APRIL, 1960

national norm

Section P

Section M

Section C

Figure 2 illustrates the academic growth in months made in the school year (October-April) 1958-59 and in the school year 1959-60. The experimental group is divided in two ways: (1) by I. Q. range and (2) by amount of achievement grouping experience. All subjects tested were averaged together for this figure.

In the 1958-59 figure, one notes that Groups I and III (high and low I. Q.'s) made far greater gain when they were grouped according to achievement. The growth for Group II was approximately the same in Section C and Section M.

In the figure for 1959-60, the greatest gain made by those in Section C, who had been grouped according to achievement for two years, was made by Group II. Students possessing high I. Q.'s (Group I) made approximately the same amount of growth in Sections P, M, and C. Group III's gain was approximately the same in Sections P and C but was far lower in Section M.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 2 is shown in Table II.

TABLE II

ACHIEVEMENT LEVELS SCORED BY ALL GROUPS
IN A TWO YEAR PERIOD

1958-1959

	GROUP I		GROUP II		GROUP III	
	Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
M	4.51	5.42	3.91	5.09	3.48	4.17
C	4.73	6.05	4.48	5.65	3.30	4.66

1959-1960

P	6.60	7.6	5.57	6.9	4.34	5.8
M	6.34	7.1	5.13	6.3	4.08	5.0
C	6.96	7.8	6.14	7.6	4.71	6.0

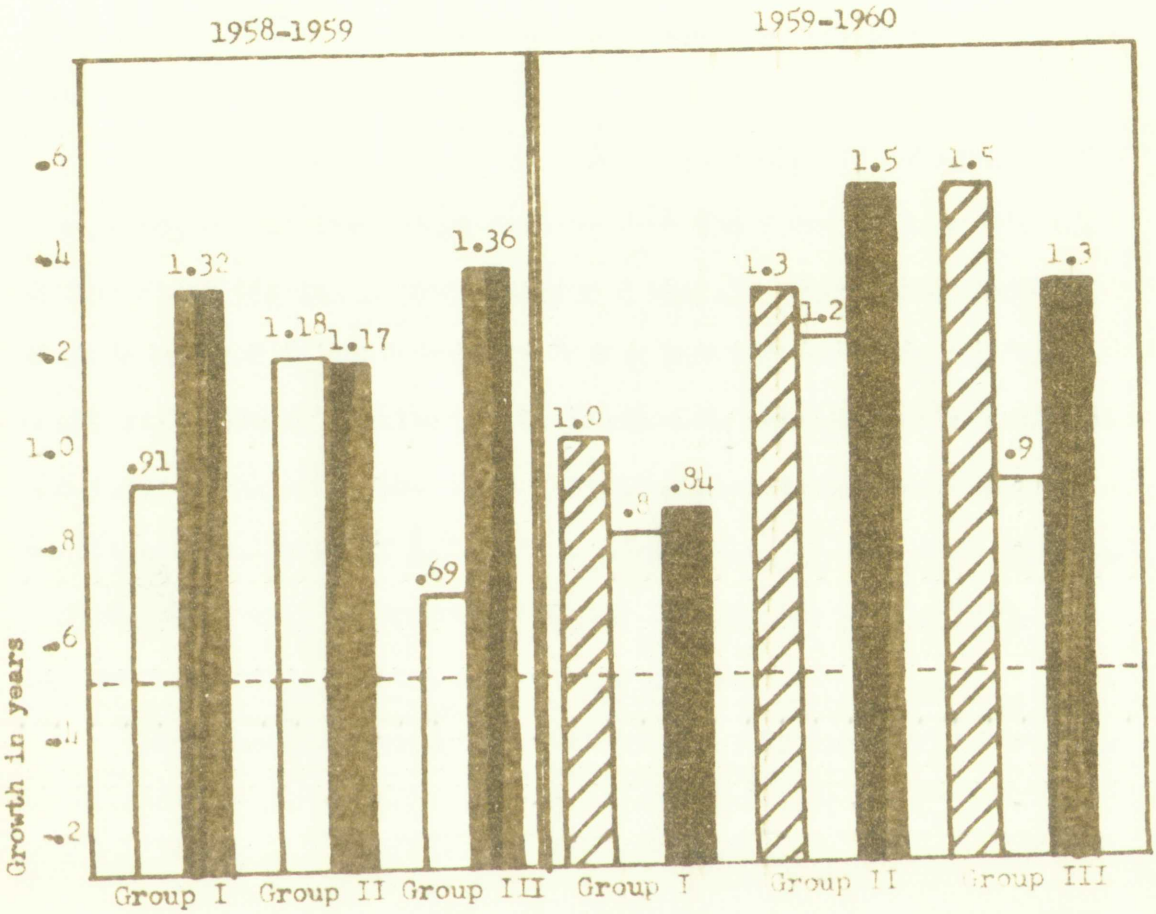

FIGURE 2

ACHIEVEMENT GAINS MADE BY ALL GROUPS
IN A TWO YEAR PERIOD

---- national norm

Section P

Section M

Section C

Figure 3 illustrates the grade placement of all students in the experimental group. The I. Q. groups of each section have been combined and their composite scores averaged for the purposes of this illustration.

Section C, which had been grouped according to achievement for two years, was .3 lower than Section P at the first testing period. By the final testing period, Section C was .37 higher than Section P which had had no achievement grouping experience. This represents a .67 gain made by Section C over Section P. The grade placement of the three sections at the final testing period should be compared to the national norm of 4.7. It is interesting to note that the only section which made an appreciable gain between the April, 1959, and the October, 1959, testing periods was Section C.

The numerical presentation of Figure 3 is shown in Table III.

TABLE III

GRADE PLACEMENT OF ALL STUDENTS IN THE EXPERIMENTAL GROUP FROM OCTOBER, 1958, TO APRIL, 1960

	Oct., 1958	Apr., 1959	Oct., 1959	Apr., 1960	Oct., 1958-Apr., 1959	Oct., 1959-Apr., 1960	Oct., 1958-Apr., 1960
Normal growth	3.2	3.7	4.2	4.7	.5	.5	1.5
Section P	4.47	5.46	5.50	6.77	.99	1.27	2.30
Section M	3.97	4.89	5.18	6.13	.92	.95	2.16
Section C	4.17	5.45	5.94	7.14	1.28	1.20	2.97

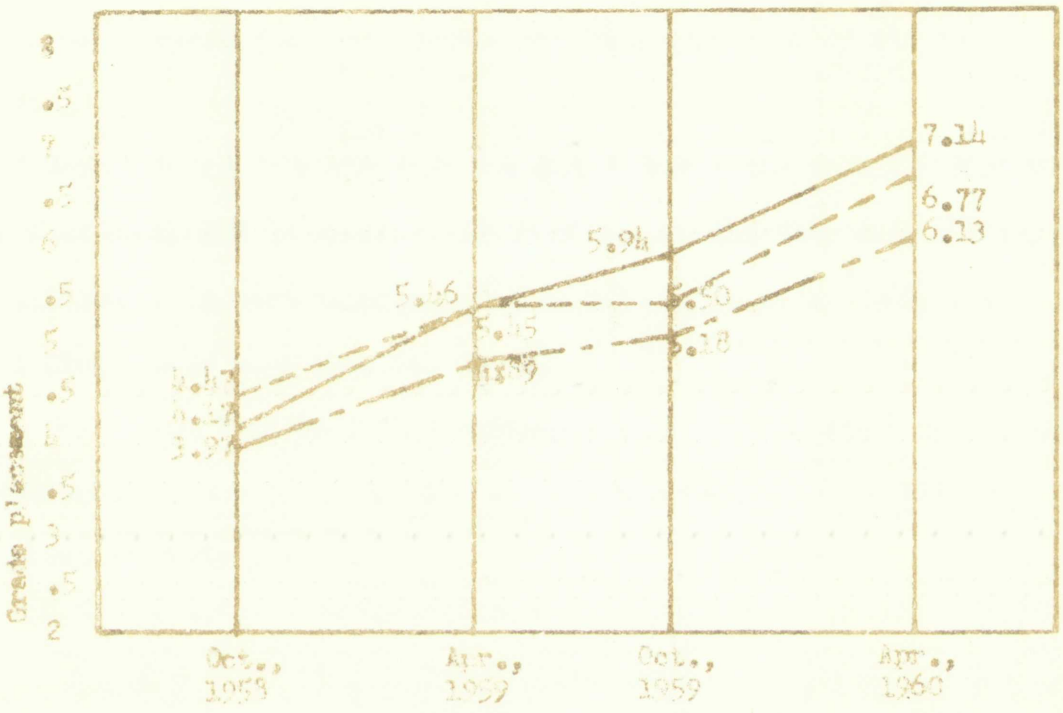

FIGURE 3

GRADE PLACEMENT OF ALL STUDENTS IN THE EXPERIMENTAL GROUP FROM OCTOBER, 1958, TO APRIL, 1960

- - - Section P

——— Section M

——— Section C

Figure 4 shows the growth in months made in the school year 1958-59 by Group I (high I. Q.). It compares Section M with Section C. It should be noted here that at this time (April, 1959) Section C had been grouped according to achievement only one year and Section M had had no achievement grouping experience. The figure shows the gains made in reading and arithmetic and in a composite of the two subjects.

One notes immediately that Section C scores consistently higher gains than Section M in reading, arithmetic, and the composite score. This difference is particularly noted in arithmetic where Section C scored five months more than Section M.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 4 is shown in Table IV.

TABLE IV

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP I
FROM OCTOBER, 1958, TO APRIL, 1959

SECTION M

Reading		Arithmetic		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
5.0	5.6	4.0	5.1	4.5	5.4

SECTION C

5.4	6.3	4.1	5.7	4.7	6.1

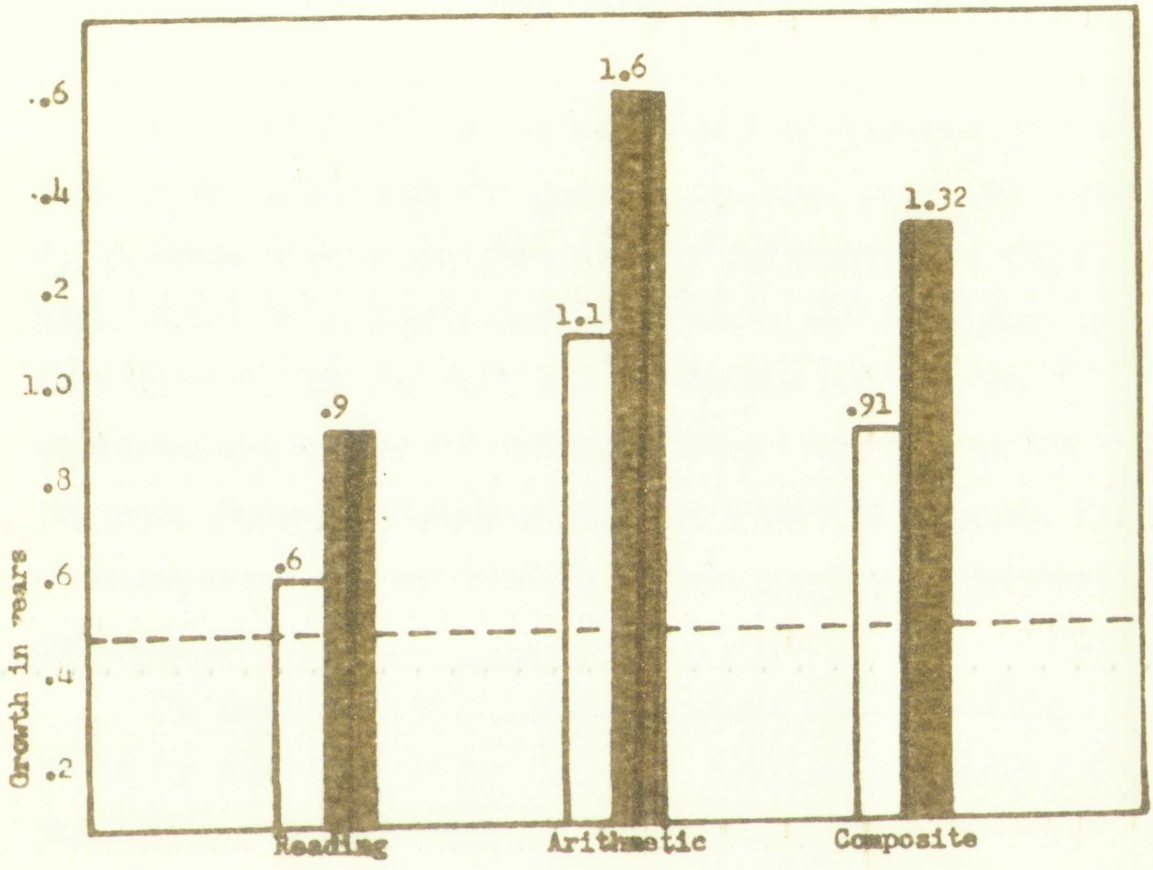

FIGURE 4

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP I
FROM OCTOBER, 1958, TO APRIL, 1959

--- national norm

Section M

Section C

Figure 5 shows the growth in months made in the school year 1959-60 by Group I. It compares Sections P, M, and C. The figure shows the gains made in reading, arithmetic, language, and a composite of the three subjects.

One notes the striking difference in reading growth. Section P made a five months gain over Section M and seven months over Section C. It should be noted here that Section P had experimented with a modified form of the Joplin Reading Plan during the school year, and this may or may not have had bearing on the test results. The arithmetic gain made by all sections of Group I was approximately the same. Section C outdistanced Sections M and P in language. The composite scores show approximately the same growth among the three sections.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 5 is shown in Table V.

TABLE V

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP I
FROM OCTOBER, 1959, TO APRIL, 1960

SECTION P

Reading		Arithmetic		Language		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
7.3	8.6	5.6	6.7	6.9	7.6	6.6	7.6

SECTION M

6.8	7.6	5.6	6.6	6.6	7.1	6.34	7.1

SECTION C

7.5	8.1	6.0	6.9	7.3	8.5	6.96	7.8

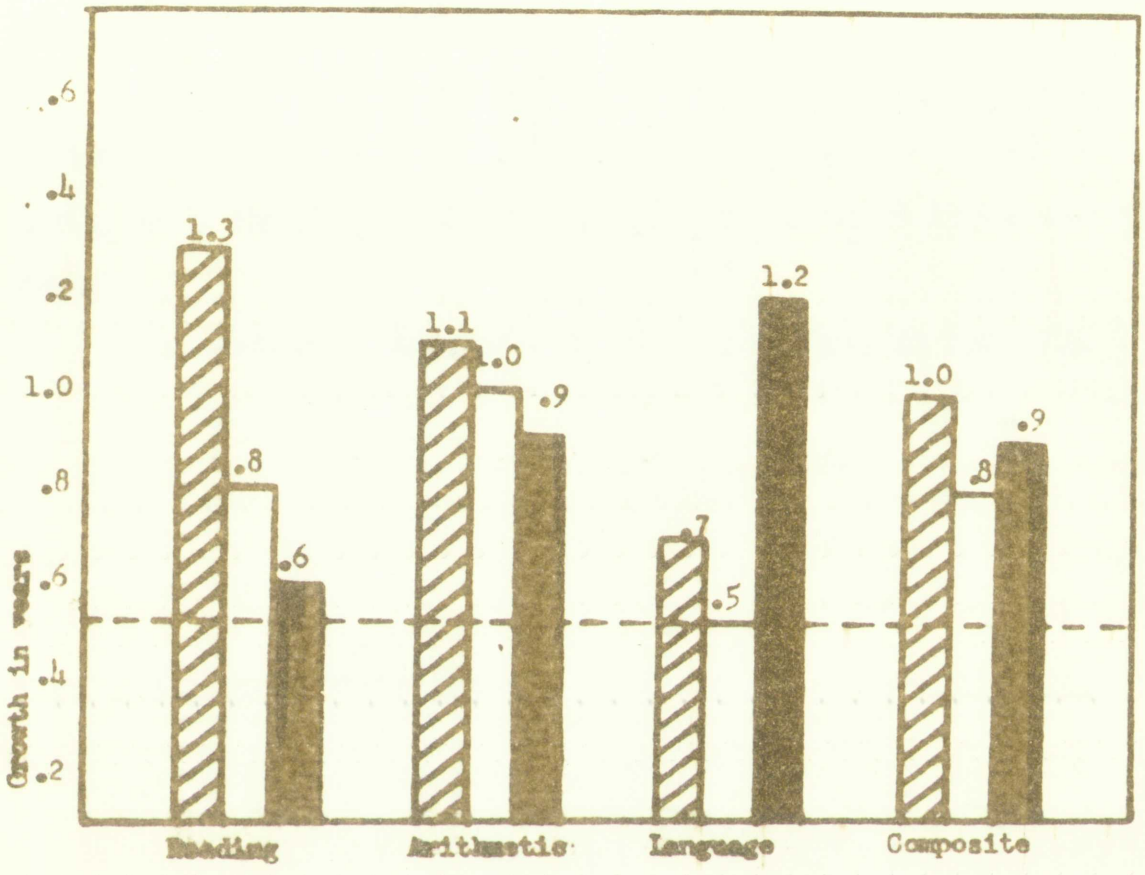

FIGURE 5

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP I
FROM OCTOBER, 1959, TO APRIL, 1960

--- national norm

Section P

Section M

Section C

Figure 6 illustrates the grade placement of students in Group I (high I. Q.). The composite scores have been averaged for the purposes of this illustration.

Section C has made a .68 gain over Section P. Section M has made a .2 gain over Section P. The figures 7.8, 7.6, and 7.1 at the April, 1960, testing period may be compared to 4.7 which is the national norm.

The numerical presentation of Figure 6 is shown in Table VI.

TABLE VI

GRADE PLACEMENT OF GROUP I FROM OCTOBER, 1958, TO APRIL, 1960

	Oct., 1958	Apr., 1959	Oct., 1959	Apr., 1960	Oct., 1958-Apr., 1959	Oct., 1959-Apr., 1960	Oct., 1958-Apr., 1960
Normal growth	3.2	3.7	4.2	4.7	.5	.5	1.5
Section P	5.21	5.92	6.6	7.6	.71	1.0	2.39
Section M	4.51	5.42	6.34	7.1	.91	.76	2.59
Section C	4.73	6.05	6.93	7.8	1.32	.84	3.07

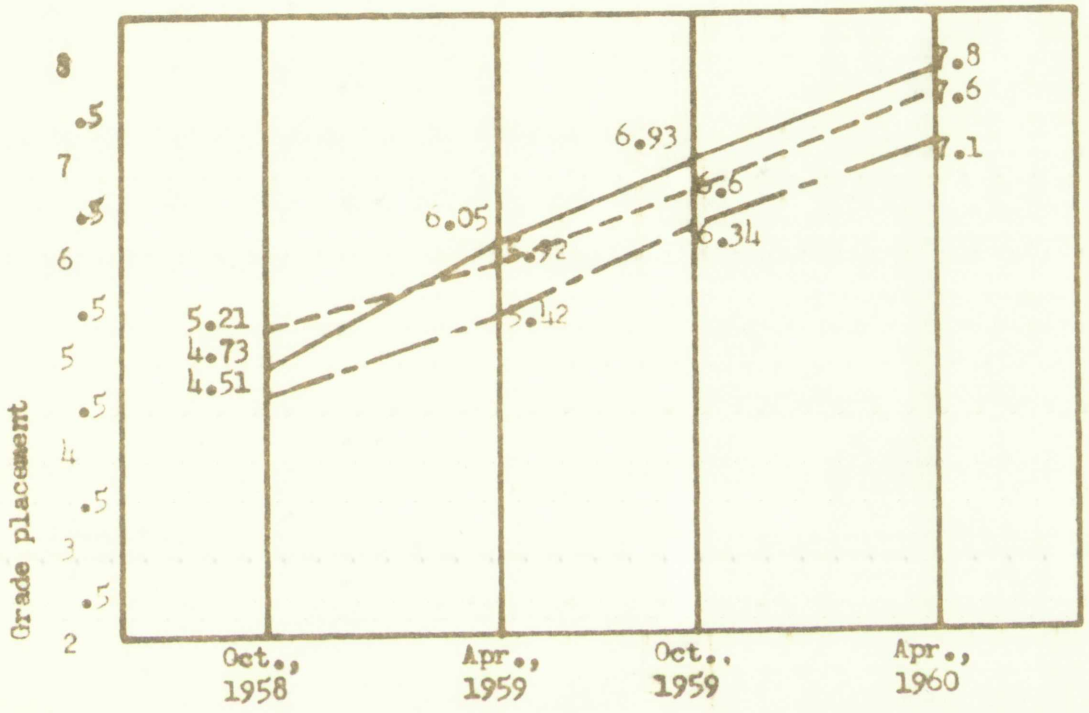

FIGURE 6

GRADE PLACEMENT OF GROUP I FROM OCTOBER, 1958, TO APRIL, 1960

- - - Section P

—— Section M

——— Section C

Figure 7 illustrates the comparison of the rate of academic growth in high I. Q. students who have been grouped by achievement for two years and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. As seen in Figure 7, Group I, Section C, was two months below its expectancy at the beginning of the testing period. A steady rise above the expectancy line is observed, with these pupils ending the testing period one year and one month above expectancy.

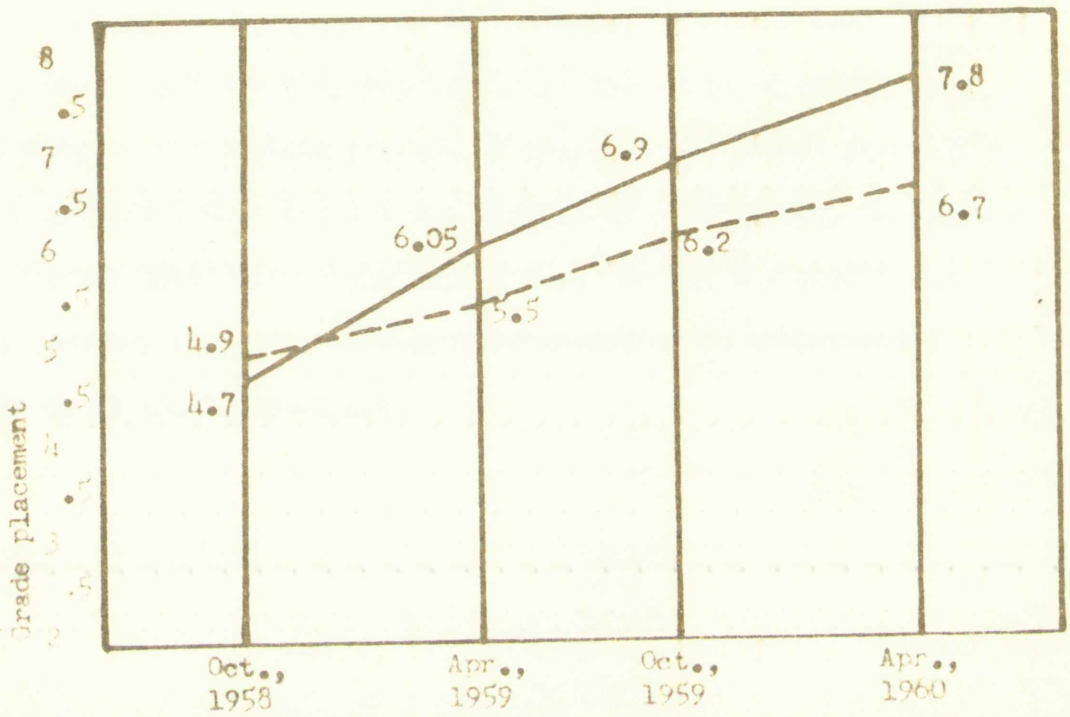

FIGURE 7

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP I, SECTION C FROM OCTOBER, 1958, TO APRIL, 1960

——— Group I, Section C

- - - Expectancy

Figure 8 illustrates the comparison of the rate of academic growth in high I. Q. students who have been grouped by achievement for one year and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. As seen in Figure 8, Group I, Section M, was nearly .5 below its expectancy at the beginning of its testing period. Throughout the school year 1958-59, the year before this section was grouped by achievement, the pupils remain somewhat lower than their expectancy. During the school year 1959-60, however, when they were grouped according to achievement, they rose to .3 above expectancy.

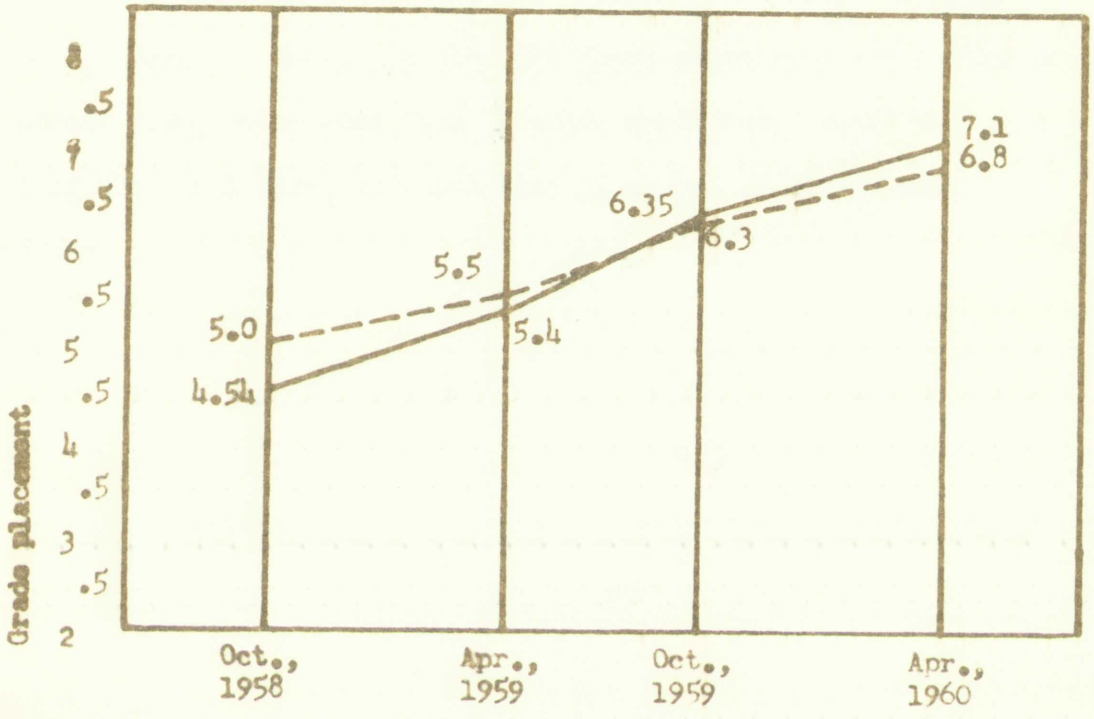

FIGURE 8

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP I, SECTION M FROM OCTOBER, 1958, TO APRIL, 1960

——— Group I, Section M

– – – Expectancy

Figure 9 illustrates the comparison of the rate of academic growth in high I. Q. students who have had no achievement grouping experience and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. Group I, Section P, began the testing period .26 above expectancy and continued in a steady rise, never more than .4 above expectancy, until the period of the final test, at which time it scored .8 higher than expectancy.

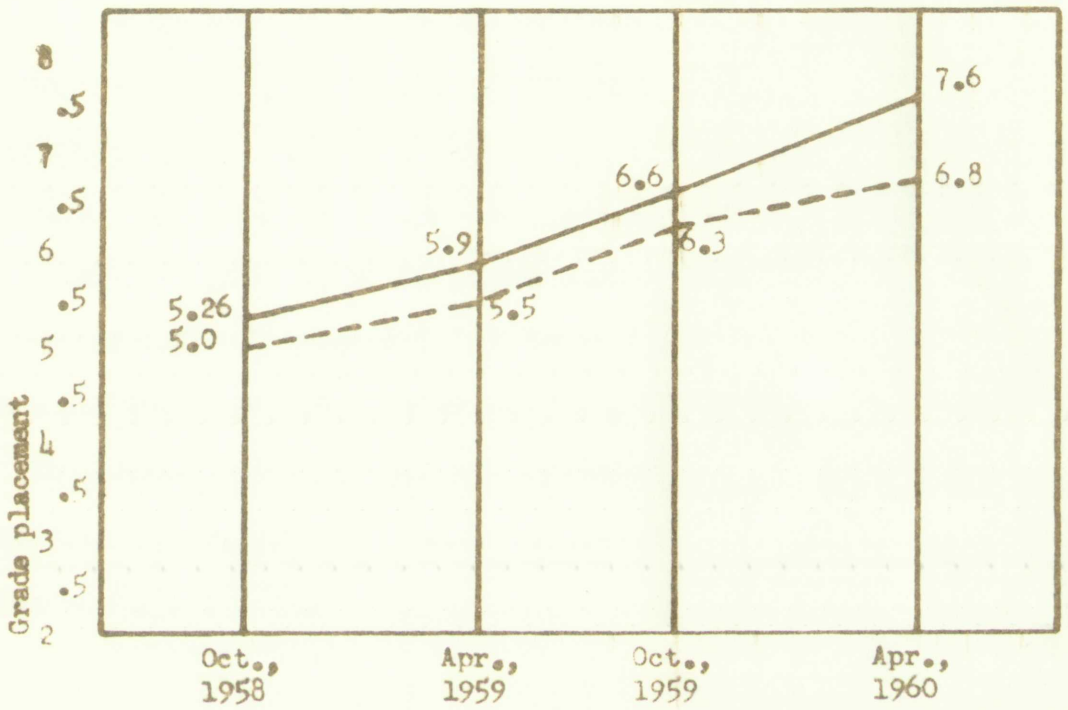

FIGURE 9

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP I, SECTION P FROM OCTOBER, 1958, TO APRIL, 1960

——— Group I, Section P

- - - - Expectancy

Figure 10 shows the growth in months made in the school year 1959-60 by Group II (middle I. Q. range). It compares Section M with Section C. It should be noted here that at this time (April, 1959) Section C had been grouped according to achievement only one year and Section M had had no achievement grouping experience. The figure shows the gains made in reading and arithmetic and a composite of the two subjects.

There is no striking difference in gain between the two sections represented here, with the possible exception of reading, in which the students not grouped by achievement scored four months growth above those who had been grouped by achievement.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 10 is shown in Table VII.

TABLE VII

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP II
FROM OCTOBER, 1958, TO APRIL, 1959

SECTION M

Reading		Arithmetic		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
4.1	5.5	3.6	4.7	3.91	5.09

SECTION C

4.9	5.9	4.0	5.4	4.48	5.65

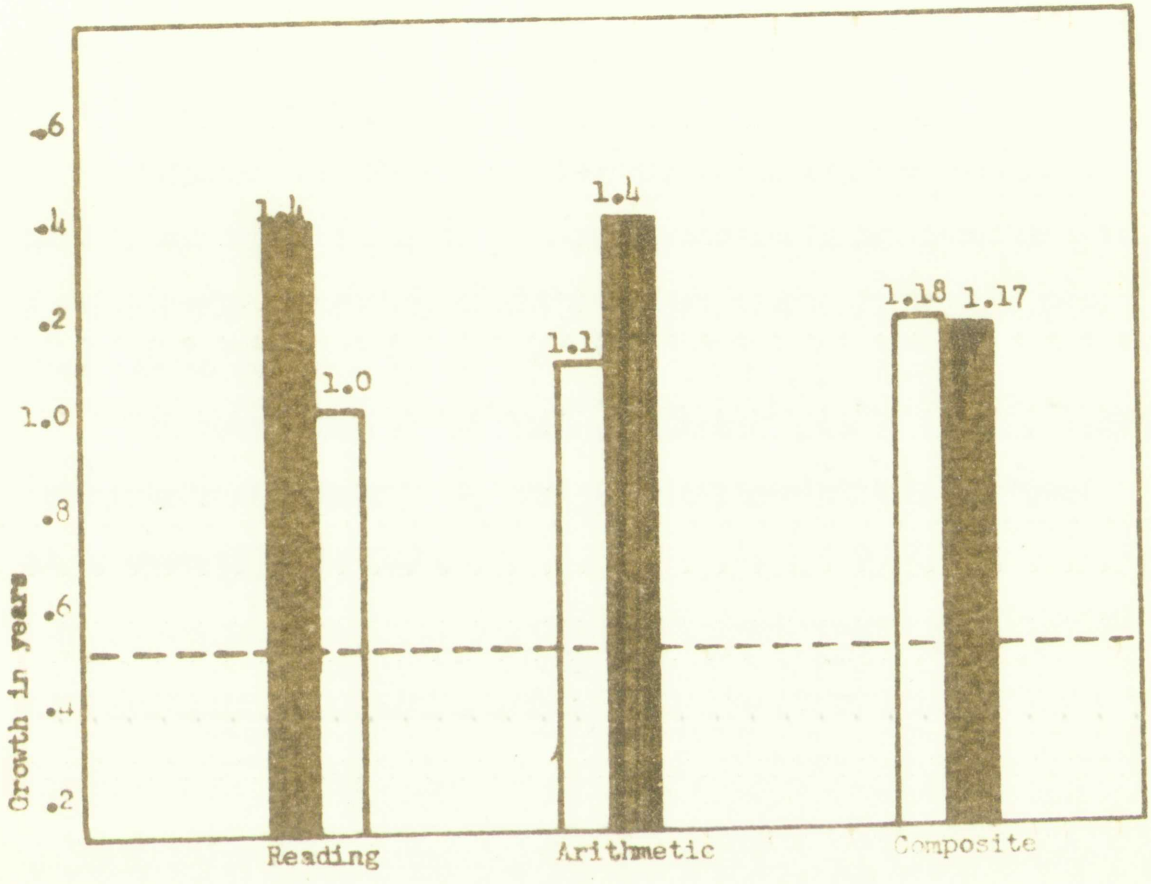

FIGURE 10

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP II
FROM OCTOBER, 1958, TO APRIL, 1959

---- national norm

Section M

Section C

Figure 11 shows the growth in months made in the school year 1959-60 by Group II. It compares Sections P, M, and C. The figure shows the gains made in reading, arithmetic, language, and a composite of the three subjects.

Although the differences among the three sections are not too marked, one notes that Section C scores somewhat higher than Sections P and M except in reading, in which Section P made one month's gain over Section C.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 11 is shown in Table VIII.

TABLE VIII

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP II
FROM OCTOBER, 1959, TO APRIL, 1960

SECTION P

Reading		Arithmetic		Language		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
5.8	7.4	5.4	6.6	5.6	6.8	5.57	6.9

SECTION M

5.6	6.8	4.9	6.1	5.0	6.1	5.13	6.3

SECTION C

6.3	7.8	5.4	6.9	6.7	8.1	6.14	7.6

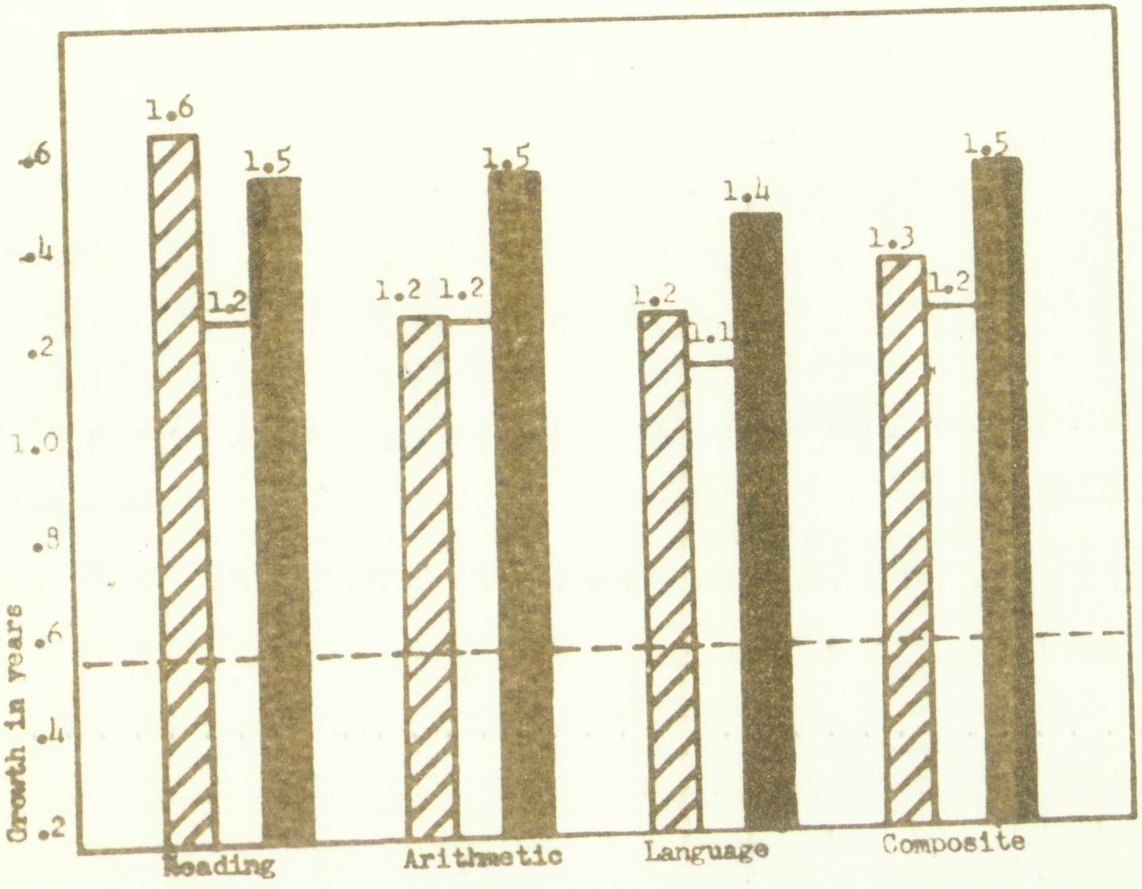

FIGURE 11

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP II
FROM OCTOBER, 1959, TO APRIL, 1960

---- national norm

Section P

Section M

Section C

Figure 12 illustrates the grade placement of students in Group II (middle I. Q. range). The composite scores have been averaged for the purposes of this illustration.

A very great difference is observed between the line representing Section C and the lines representing Sections P and M. The total growth made by Section C was 3.12; total growth made by Section P was 2.38; total growth made by Section M was 2.39. The normal growth over this period would be 1.5. Section C is the only section which made appreciable growth between the April, 1959, and October, 1959, testing periods.

The numerical presentation of Figure 12 is shown in Table IX.

TABLE IX

GRADE PLACEMENT OF GROUP II FROM OCTOBER, 1958, TO APRIL, 1960

	Oct., 1958	Apr., 1959	Oct., 1959	Apr., 1960	Oct., 1958-Apr., 1959	Oct., 1959-Apr., 1960	Oct., 1958-Apr., 1960
Normal growth	3.2	3.7	4.2	4.7	.5	.5	1.5
Section P	4.52	5.65	5.57	6.9	1.13	1.33	2.38
Section M	3.91	5.09	5.13	6.3	1.18	1.17	2.39
Section C	4.48	5.65	6.14	7.6	1.17	1.46	3.12

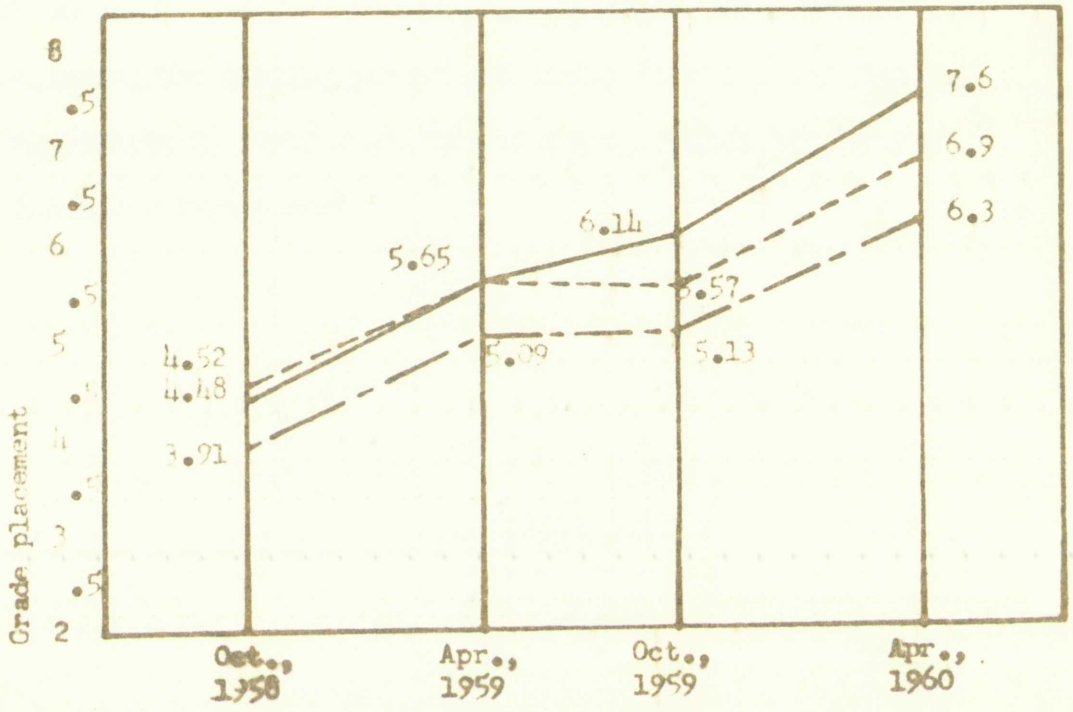

FIGURE 12

GRADE PLACEMENT OF GROUP II FROM OCTOBER, 1958, TO APRIL, 1960

- - - Section P

—— Section M

——— Section C

Figure 13 illustrates the comparison of the rate of academic growth among middle range I. Q. students who have been grouped by achievement for two years and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. Beginning the testing period .48 higher than its expectancy, Group II, Section C, soars consistently above, ending the two year period 1.1 above expectancy.

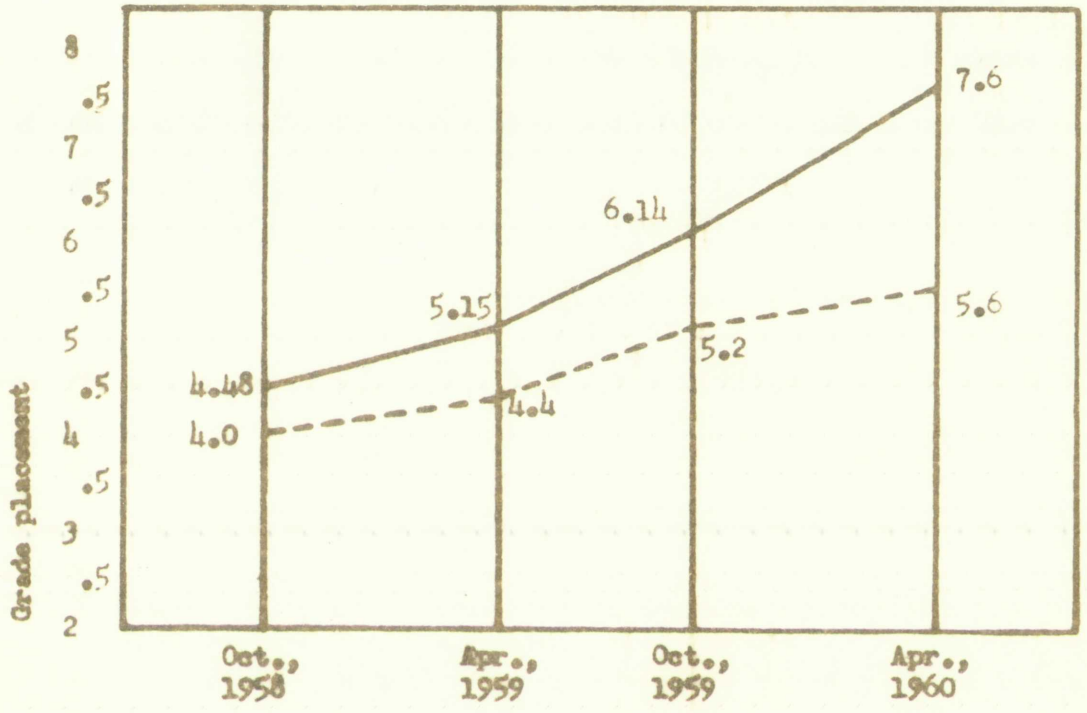

FIGURE 13

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP II, SECTION C FROM OCTOBER, 1958, TO APRIL, 1960

—— Group II, Section C

- - - Expectancy

Figure 14 illustrates the comparison of the rate of academic growth in middle range I. Q. students who have been grouped by achievement for one year and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. Group II, Section M, ended the two year testing period .6 higher than expectancy although it scored below expectancy at two other times in the two year period.

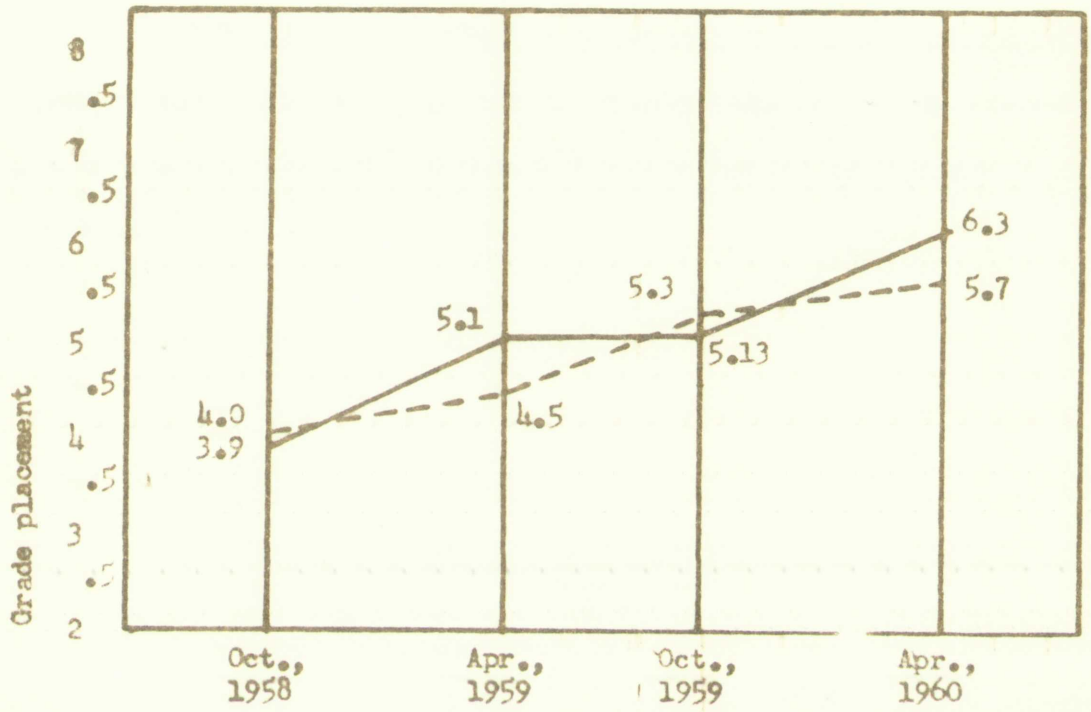

FIGURE 14

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP II, SECTION M FROM OCTOBER, 1958, TO APRIL, 1960

—— Group II, Section M

- - - Expectancy

Figure 15 illustrates the comparison of the rate of academic growth in middle range I. Q. students who have had no achievement grouping experience and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. According to the figure, Group II, Section P, is never closer than .29 to its expectancy, always scoring higher and ending the test period 1.2 higher than expectancy.

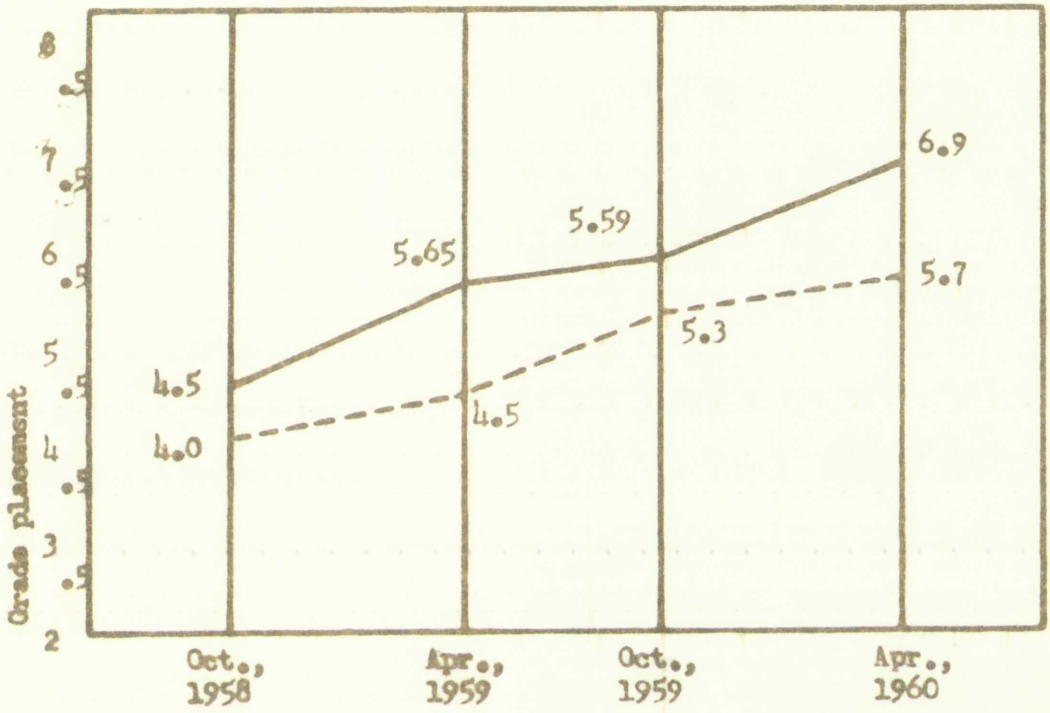

FIGURE 15

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP II, SECTION P FROM OCTOBER, 1958, TO APRIL, 1960

——— Group II, Section P

– – – Expectancy

Figure 16 shows the growth in months made in the school year 1958-59 by Group III. It compares Section M with Section C. It should be noted here that at this time (April, 1959) Section C had been grouped by achievement only one year and Section M had had no achievement grouping experience. The figure shows the gains made in reading and arithmetic and in a composite of the two subjects.

This figure presents a striking difference in the growth made in both subjects by Section C over Section M. In both reading and arithmetic, Section C made exactly twice as much gain as Section M.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 16 is shown in Table X.

TABLE X

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP III
FROM OCTOBER, 1958, TO APRIL, 1959

SECTION M

Reading		Arithmetic		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
3.9	4.4	3.3	3.9	3.48	4.17

SECTION C

3.3	4.7	3.3	4.5	3.3	4.66

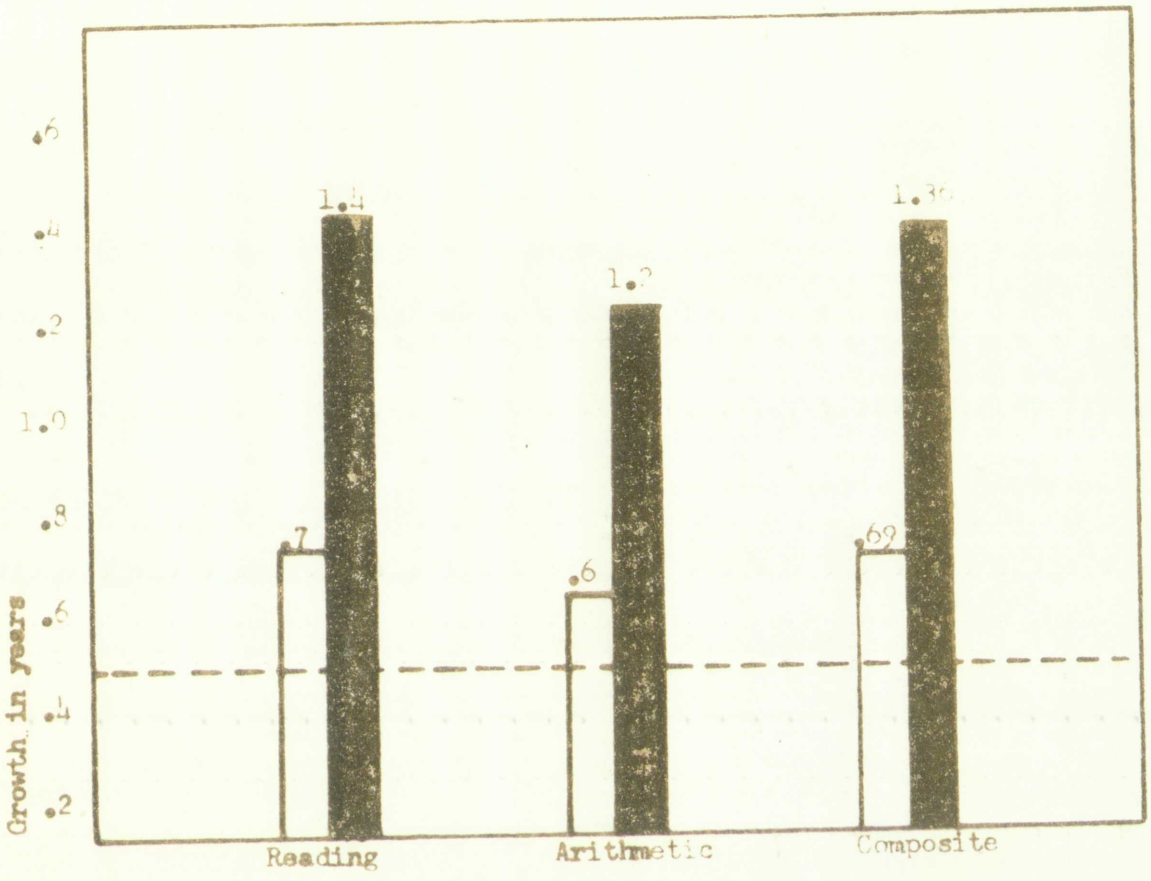

FIGURE 16

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP III
FROM OCTOBER, 1958, TO APRIL, 1959

national norm

Section M

Section C

Figure 17 shows the growth in months made in the school year 1959-60 by Group III. It compares Sections P, M, and C. The figure shows the gains made in reading, arithmetic, language, and a composite of the three subjects.

Except in language, Section P made a consistently larger gain than did the other two sections, though the gain was small enough so that it is only two months higher in the composite score than Section C.

The broken line at .5 indicates national norm of academic growth for students of average I. Q. The numerical presentation of Figure 17 is shown in Table XI.

TABLE XI

ACHIEVEMENT LEVELS BY SUBJECT MADE BY GROUP III
FROM OCTOBER, 1959, TO APRIL, 1960

SECTION P

Reading		Arithmetic		Language		Composite	
Oct.	Apr.	Oct.	Apr.	Oct.	Apr.	Oct.	Apr.
4.6	6.2	3.9	5.5	4.5	5.6	4.3	5.8

SECTION M

4.1	5.3	4.1	5.0	4.1	4.6	4.1	5.0

SECTION C

4.8	6.0	4.5	5.9	4.8	6.0	4.7	6.0

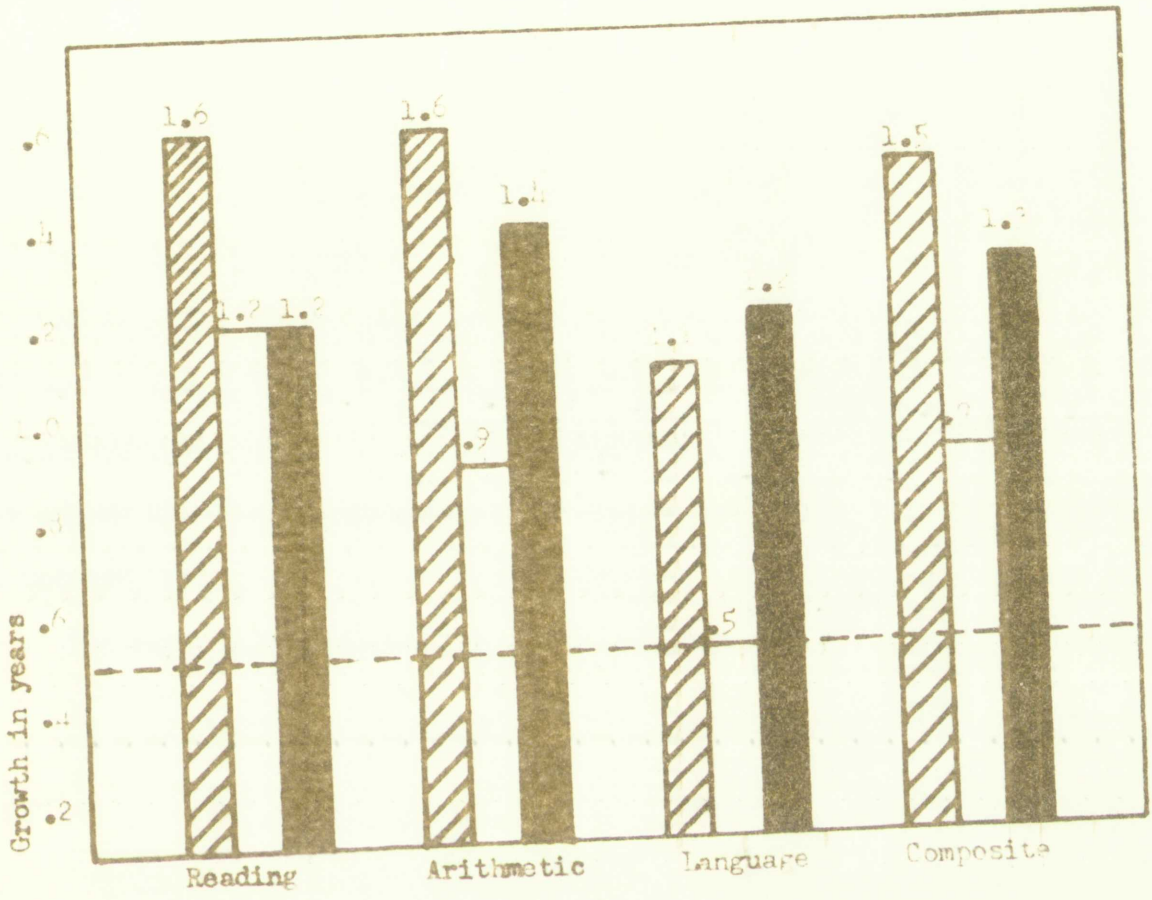

FIGURE 17

ACHIEVEMENT RATES BY SUBJECT MADE BY GROUP III
FROM OCTOBER, 1959, TO APRIL, 1960

--- national norm

Section P

Section M

Section C

Figure 18 illustrates the grade placement of students in Group III (low I. Q.). The composite scores have been averaged for the purposes of this illustration.

Section C, which started in October, 1958, lower than either of the other sections, at 3.30, made a growth of 2.73; this compares with Section P's 2.11 and Section M's 1.52. Section C in October, 1958, was only slightly higher than the national norm (3.30 as compared to 3.2) but in April, 1960, it was 1.33 (6.03 as compared to 4.7) higher than the national norm. It should be noted that Section C was the only one of the three sections to make a gain between April, 1959, and October, 1959.

The numerical presentation of Figure 18 is shown in Table XII.

TABLE XII

GRADE PLACEMENT OF GROUP III FROM OCTOBER, 1958, TO APRIL, 1960

	Oct., 1958	Apr., 1959	Oct., 1959	Apr., 1960	Oct., 1958-Apr., 1959	Oct., 1959-Apr., 1960	Oct., 1958-Apr., 1960
Normal growth	3.2	3.7	4.2	4.7	.5	.5	1.5
Section P	3.69	4.8	4.34	5.80	1.11	1.46	2.11
Section M	3.48	4.17	4.08	5.00	.69	.92	1.52
Section C	3.30	4.06	4.71	6.03	1.36	1.32	2.73

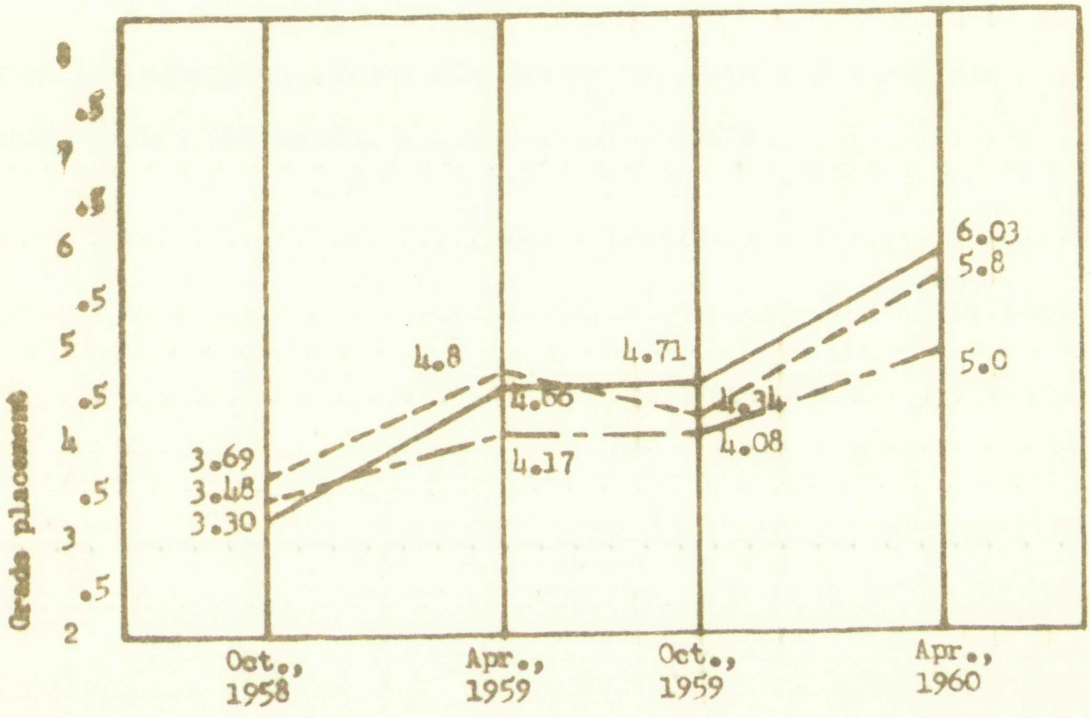

FIGURE 18

GRADE PLACEMENT OF GROUP III FROM OCTOBER, 1958, TO APRIL, 1960

- - - - Section P

——— Section M

——— Section C

Figure 19 illustrates the comparison of the rate of academic growth in low I. Q. students who have been grouped by achievement for two years and the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. Starting almost exactly at its expectancy, Group III, Section C, rises rapidly above expectancy, ending the testing period a full 1.4 above.

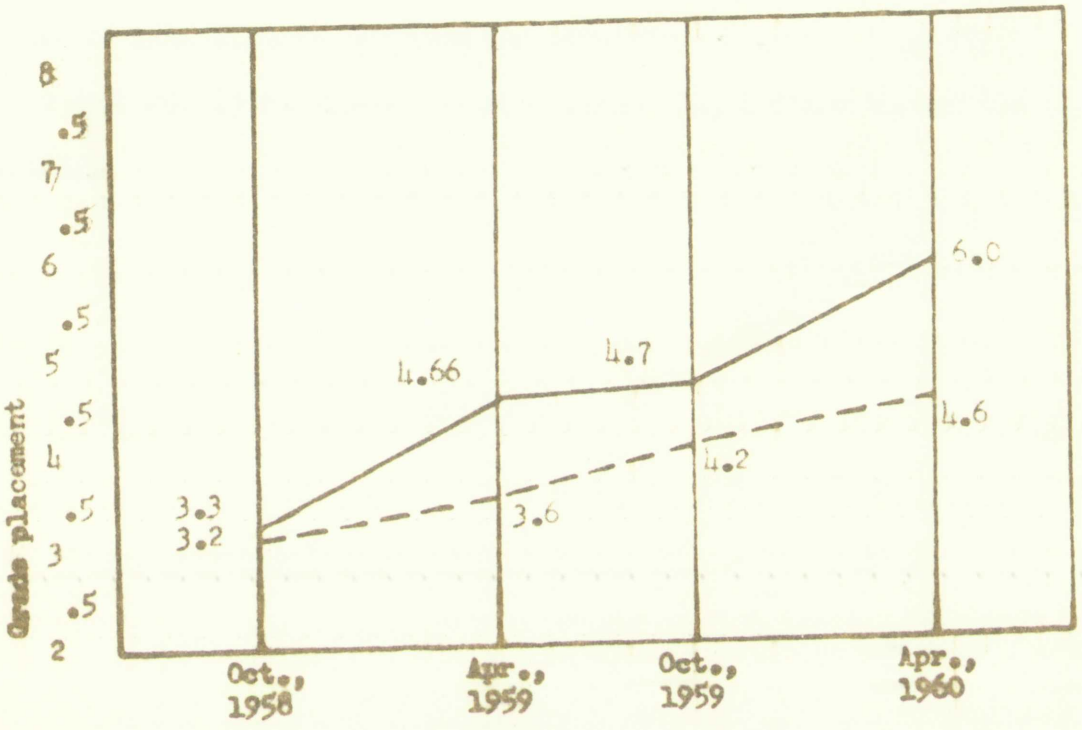

FIGURE 19

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP III, SECTION C FROM OCTOBER, 1958, TO APRIL, 1960

—— Group III, Section C

- - - Expectancy

Figure 20 illustrates the comparison of the rate of academic growth in low I. Q. students who have been grouped by achievement for one year with the expectancy for those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. This figure shows no appreciable difference between Group III, Section N, and its expectancy.

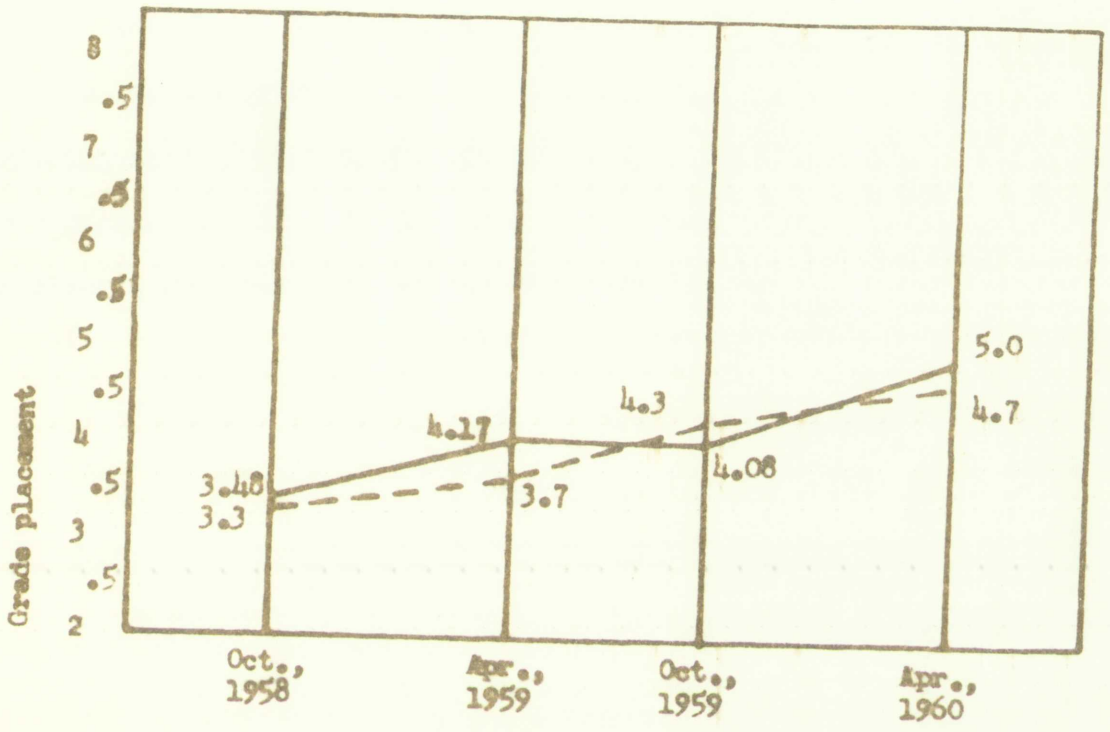

FIGURE 20

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP III, SECTION M FROM OCTOBER, 1958, TO APRIL, 1960

——— Group III, Section M

– – – Expectancy

Figure 21 illustrates the comparison of the rate of academic growth in low I. Q. students who have had no achievement grouping experience and the expectancy of those students. Expectancy figures have been computed by the University of California Test Bureau on the basis of intelligence quotient and chronological age. This figure shows an erratic growth rate for Group III, Section P. Although the beginning test of the two year period shows these students only .3 above expectancy and the third test shows them slightly lower than expectancy, the second and fourth tests see them 1.0 above expectancy.

FIGURE 21

GROWTH BY GROUPING EXPERIENCE COMPARED WITH THE EXPECTANCY TABLES FOR GROUP III, SECTION P FROM OCTOBER, 1958, TO APRIL, 1960

——— Group III, Section P

- - - - Expectancy

IV. SUMMARY

The results of this study support other evidence that achievement grouping is not a panacea for all educational ills. They do, however, indicate that achievement grouping may be a forward step in the attempt to develop more fully the abilities of the individuals committed to the charge of public education. This study is limited in several particulars, especially in the following two: (1) two years is a short span of time for any study of this nature; (2) ninety pupils comprise a very small experimental group on which to base any far-reaching conclusions. It is submitted, however, that, in spite of these limitations, the results of the study would indicate that sufficient gain has been made by achievement grouping to justify its continued use.

The results, as shown in this chapter, give evidence to the fact that all three I. Q. groups studied benefitted from achievement grouping. The composite growth rate of those who had been grouped by achievement for two years was substantially higher than that of those who had been grouped by achievement for only one year and those who had had no achievement grouping experience.

One further point should be mentioned in summarizing this study: the success of achievement grouping, or any other educational technique, depends to a very great extent on the ability and attitude of the individual classroom teacher. It is highly possible, for instance, that a skilled teacher for a heterogeneously grouped class, or for a "low" class in achievement grouping, might be a poor teacher

for a "high" class. The existence of such a situation could result from either the ability or the attitude of the teacher involved. Should such a situation exist, it would very likely mean that the children involved would not receive the highest benefits from achievement grouping.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations presented in this chapter are based largely on the statistical data compiled and analyzed in the preceding chapter. Three of the conclusions, however, are based on these statistics plus personal observation and discussion with teachers and other school personnel. Great care has been taken to assure objectivity and validity in this study, but because of its nature and the fact that personality cannot be truly divorced from any experiment in education, these last three conclusions do contain a measure of subjectivity.

I. CONCLUSIONS

1. Children, in almost all cases, made a greater academic gain under achievement grouping than under heterogeneous grouping. In 1958-59, Section C, which included students who had been grouped according to achievement at that time for one year, soared ahead of Section M, which had not been grouped by achievement, in I. Q. Groups III and I, actually doubling the academic growth made by Group III. The growth made by Group II in both sections was almost exactly the same.

In 1959-60, in comparing again Sections C and M, one notes that Section M in Group I was slightly behind Section C. In Groups II and III Section C was far ahead.

In comparing Section C with Section P, students who had had no achievement grouping experience but who had been for one year under an experimental reading program explained in Chapter III, one concludes that Section P has made a very slight gain in academic growth over Section C in reading in all groups, that Section C outdistanced the other sections in arithmetic and language in Group II, and that Section P has slightly outranked the other sections in Groups I and III.

2. Children who had been grouped by achievement for two years made a substantial overall gain over those who had been grouped by achievement for one year and over those who had had no achievement grouping experience. A composite growth of nearly three years (2.99) was made by all students in Section C. This is .69 higher than the growth made by Section P and .79 higher than the growth made by Section M.

From the results of the language tests, the obvious conclusion is drawn that Section C in every section and group and in every testing period made a far greater gain than did either of the other sections. Section C also surpassed the other sections in growth in arithmetic, with Section M scored second in these tests. Section P, however, outranked the other sections in reading.

3. Although all groups in Section C made a greater gain academically than those in the other sections, Groups II and III made the highest gain over the two year period. Both Group II and Group

III of Section C scored seven months higher than the next highest section. Group I of Section C scored five months higher than the next highest section.

Second high in academic growth in Group I was Section M who gained two months more than Section P's Group I. Group II in Sections M and P scored the same growth. Section P made a one month gain over Section M in Group III.

4. A greater gain in non-tested areas has been made by Group I students who have been grouped by achievement than by Group I students grouped heterogeneously. Although it was not possible for the purposes of this study to administer tests other than the standard reading, arithmetic, and language, the investigator has strong evidence from observation and from teacher reports, that high I. Q. students have made far higher growth in science and social studies and "special" subjects than they did under a heterogeneous grouping plan. This is likely to have been caused by the fact that no time must be spent on material already known by the more gifted children as opposed to the heterogeneous system in which instruction must be geared as nearly as possible to the learning rates of all the children.

5. Children with high I. Q.'s are challenged to achieve far more in achievement grouping than in heterogeneous grouping. It follows naturally that competition is keenest among students of relatively equal abilities. Achievement grouping, therefore, satisfies a need particularly for the gifted children who are encouraged to development

of their individual potentials to a greater degree than in heterogeneous grouping.

6. Greater possibilities for the development of leadership and total class contribution are present in the average and slower groups in achievement grouping than are present in heterogeneous grouping. Many children of average and low average ability and achievement have "blossomed" in an atmosphere of equality of ability whereas they were unable to make significant contributions to the class or to develop leadership qualities when they were in competition with children of far greater abilities.

II. RECOMMENDATIONS

Based on the analysis of data collected in this study and from the conclusions drawn from them, the following recommendations are made:

1. In achievement grouping, classes should be kept small. This is, of course, the goal for all schools and any type of grouping; it appears, however, that slower groups, particularly, would demand such an amount of individualized attention that to achieve the best results from achievement grouping these groups should have a maximum of twenty students. In this study, Section C made an appreciably greater gain than Section M, even at the time when both sections had been grouped by achievement for the same amount of time. A discernible difference in the two sections was that Section C had small classes and Section M had large classes.

2. To best meet the individual needs of the students, both inter-class and intra-class grouping must be kept highly flexible. This is a difficult problem, but thoughtful attention by teacher and principal should make it possible and effective.

3. Achievement grouping should be continued essentially as described in this study; however some effort should be made to incorporate a system similar to the modified Joplin Reading Plan within the existing achievement grouping system. Since those students who participated in this plan, as explained earlier in the study, showed a large gain in reading but did not show equal gains in arithmetic and language, it would appear that neither achievement grouping nor the Joplin Plan has the total answer to highest academic growth. However, the two in combination might be a very large step forward and would bear some attention and further study.

4. Great care should be exercised in the choice of teachers for the various section. The administration should take into consideration the teacher's preference, his attitude toward achievement grouping and each section of it, his ability, and his total personality.

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APPENDIX

TEST RESULTS FOR GROUP I, SECTION C
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	FL1	WK1	HS1	KJ1	SB1	HL2	MC1	PE1	CJ1	RB2
Reading	5.9	5.7	5.7	5.6	5.4	5.6	5.0	5.0	4.7	4.5
Arithmetic	4.5	4.0	3.7	4.6	4.2	4.0	4.1	4.2	3.5	3.8
Composite	5.2	4.9	4.7	5.1	4.8	4.8	4.6	4.9	4.1	4.2
Above G. P.	3.0	1.7	1.5	1.9	1.6	1.6	1.4	1.7	.9	1.0
Expectancy	-.4	-.2	.2	.5	.3	.5	.1	-.1	-.8	.3
October, 1958	Group Mean . . . . 4.71 Group Median . . . 4.8 Group Expectancy . -.04									
Reading	7.2	6.6	7.3	6.6	6.0	6.7	5.9	6.6	5.4	5.0
Arithmetic	6.0	5.6	6.0	6.0	5.5	5.4	5.7	5.8	5.8	5.5
Composite	6.6	6.1	6.7	6.3	5.8	6.1	5.8	6.2	5.6	5.3
Above G. P.	2.9	2.4	3.0	2.6	2.1	2.4	2.1	2.5	1.9	1.6
Expectancy	.3	.5	1.4	.8	.4	1.1	.4	.5	.2	.8
April, 1959	Group Mean . . . . 6.1 Group Median . . . 6.1 Group Expectancy . .64									
Reading	8.7	8.6	8.1	7.7	7.2	6.6	7.5	7.7	6.7	6.3
Arithmetic	6.7	6.1	6.3	6.3	6.1	6.0	5.3	6.0	5.9	5.5
Language	8.0	7.2	8.4	7.6	7.8	6.7	6.8	8.6	5.9	6.0
Composite	7.8	7.3	7.6	7.2	7.0	6.4	6.5	7.4	6.2	5.9
Above G. P.	3.6	3.1	3.4	3.0	2.8	2.2	2.3	3.2	2.0	1.7
Expectancy	.9	.9	1.9	1.2	1.1	.8	.8	1.0	.2	.7
October, 1959	Group Mean . . . . 6.9 Group Median . . . 7.1 Group Expectancy . .95									
Reading	8.8	8.3	9.0	7.8	8.0	9.3	8.2	8.5	6.5	6.2
Arithmetic	8.2	5.8	6.9	6.9	7.0	6.9	6.2	6.9	7.1	6.3
Language	9.4	7.4	9.4	8.3	8.7	9.6	8.7	8.7	7.7	6.7
Composite	8.8	7.2	8.4	7.7	7.9	8.6	7.7	8.0	7.1	6.4
Above G. P.	4.1	2.5	3.7	3.0	3.2	3.9	3.0	3.3	2.4	1.7
Expectancy	1.1	.2	1.9	1.0	1.3	2.2	1.1	.9	.5	.4
April, 1960	Group Mean . . . . 7.8 Group Median . . . 7.8 Group Expectancy . 1.06									
I. Q.	149	149	149	143	141	139	138	137	133	128
C. A. (Apr., 1960)	121	116	111	113	113	111	114	118	117	112

TEST RESULTS FOR GROUP I, SECTION M
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	KC	KJ	BL	BG	JD	TM	GK	KB	PB	EM
Reading	5.2	5.7	4.9	5.7	5.7	4.2	5.6	4.3	3.7	5.1
Arithmetic	4.4	4.3	3.8	4.2	4.3	3.6	4.3	3.6	3.6	4.1
Composite	4.8	5.0	4.4	5.0	5.0	3.9	5.0	4.0	3.7	4.6
Above G. P.	1.6	1.8	1.2	1.8	1.8	.7	1.8	.8	.5	1.4
Expectancy	-.5	-.9	-.5	-.6	.3	-1.5	.8	-.1	-.6	.1

Group Mean 4.5
Group Median . . . 4.7
Group Expectancy . -.35

Reading	5.9	6.0	6.0	6.0	6.0	4.7	6.0	5.3	4.7	5.8
Arithmetic	5.6	5.7	5.5	5.4	5.5	4.6	5.4	4.3	4.2	5.2
Composite	5.8	5.9	5.8	5.7	5.8	4.7	5.7	4.8	4.5	5.5
Above G. P.	2.1	2.2	2.1	2.0	2.1	1.0	2.0	1.1	.8	1.8
Expectancy	-.2	-.7	0	-.6	.2	-1.3	.8	.1	-.5	.3

Group Mean 5.4
Group Median . . . 5.7
Group Expectancy . -.19

Reading	7.8	8.5	5.9	7.7	5.5	5.4	7.3	6.2	4.9	8.7
Arithmetic	5.5	6.3	4.3	6.3	6.0	5.2	6.6	4.9	4.9	6.1
Language	6.2	8.5	6.4	8.2	6.9	4.5	7.6	6.7	4.3	6.5
Composite	6.5	7.8	5.5	7.7	6.1	5.0	7.2	5.9	4.7	7.1
Above G. P.	2.3	3.6	1.3	3.5	1.9	.8	3.0	1.7	.5	2.9
Expectancy	-.1	.6	-.9	.8	0	-1.7	1.6	.4	-.9	1.4

Group Mean 6.4
Group Median . . . 6.3
Group Expectancy . .12

Reading	7.9	8.9	7.1	8.9	7.6	5.3	8.2	7.8	6.1	7.7
Arithmetic	7.0	6.6	6.2	7.2	6.7	6.7	7.0	6.0	6.0	6.4
Language	6.6	8.5	6.9	7.9	8.7	5.2	7.1	6.8	6.0	7.6
Composite	7.1	8.0	6.7	8.0	7.7	5.7	7.4	6.9	6.0	7.2
Above G. P.	2.4	3.3	2.0	3.3	3.0	1.0	2.7	2.2	1.3	2.5
Expectancy	-.3	0	-.4	.3	.9	-1.8	1.2	.9	-.2	.8

Group Mean 7.1
Group Median . . . 7.2
Group Expectancy . .14

I. Q.	154	149	146	142	141	139	137	132	129	129
C. A. (Apr., 1960)	113	120	114	121	114	120	111	112	115	112

TEST RESULTS FOR GROUP I, SECTION P
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	CVS	MWJ	WGJ	DJJ	MMS	BBS	RLS	RDJ	CTJ	WKJ
Reading	6.0	5.6	6.0	5.8	5.8	5.9	5.4	5.8	6.0	6.0
Arithmetic	4.8	4.4	4.7	4.7	4.6	3.8	5.8	4.5	4.5	4.5
Composite	5.4	5.0	5.4	5.3	5.2	4.9	5.6	5.2	5.3	5.3
Above G. P.	2.2	1.8	2.2	2.1	2.0	1.7	2.4	2.0	2.1	2.1
Expectancy	-1.3	-.4	.4	0	.6	.1	1.3	.7	.4	.8

October, 1958
Group Mean 5.3
Group Median . . . 5.3
Group Expectancy . .26

Reading	6.0	6.4	8.3	6.0	6.0	5.9	5.7	6.0	6.0	6.0
Arithmetic	6.0	5.4	5.8	5.6	5.8	5.8	4.7	5.6	5.6	5.8
Composite	6.0	5.9	7.1	5.8	5.9	5.9	5.2	5.8	5.8	5.9
Above G. P.	2.3	2.2	3.3	2.1	2.2	2.2	1.5	2.1	2.1	2.2
Expectancy	-1.1	-.1	.8	.1	.5	.6	.5	.7	.3	.4

April, 1959
Group Mean 5.9
Group Median . . . 5.9
Group Expectancy . .32

Reading	8.5	7.8	7.2	7.1	8.1	7.4	6.9	6.4	6.9	6.4
Arithmetic	6.9	5.0	6.0	5.9	6.1	5.0	5.2	4.9	5.5	5.0
Language	8.9	5.4	8.0	7.9	8.8	5.2	7.9	4.7	5.4	7.2
Composite	8.1	6.1	7.1	7.0	7.7	5.9	6.7	5.3	5.9	6.2
Above G. P.	3.9	1.9	2.9	2.8	3.5	1.7	2.5	1.1	1.7	2.0
Expectancy	0	-.6	.6	1.1	1.7	0	1.2	-.4	-.2	.6

October, 1959
Group Mean 6.6
Group Median . . . 6.5
Group Expectancy . .40

Reading	9.2	8.7	9.5	8.1	9.2	8.2	9.3	7.9	7.8	8.0
Arithmetic	7.8	7.7	7.0	7.1	6.9	6.3	6.4	5.1	6.7	6.2
Language	10.0	6.9	7.0	7.1	9.4	6.4	8.9	6.4	6.6	6.8
Composite	9.0	7.8	7.8	7.4	8.5	7.0	8.2	6.5	7.0	7.0
Above G. P.	4.3	3.1	3.1	2.7	3.8	2.3	3.5	1.8	2.3	2.3
Expectancy	-.1	.4	.5	.2	1.8	.4	2.2	0	.3	.7

April, 1960
Group Mean 7.6
Group Median . . . 7.6
Group Expectancy . .61

I. Q.	160	150	150	142	141	135	134	133	131	130
C. A. (Apr., 1960)	122	115	114	117	118	115	111	115	114	115

TEST RESULTS FOR GROUP II, SECTION C
Third Grade, 1958-59
Fourth Grade, 1959-60

	WR2	NKC	GA2	CA2	CCC	RPC	UEC	CKC	FM1	TJ2
Reading	4.9	5.4	5.4	4.7	6.0	4.4	4.0	4.0	5.7	4.5
Arithmetic	3.7	4.6	4.3	4.1	4.5	3.8	3.2	3.6	4.4	4.0
Composite	4.3	5.0	4.9	4.4	5.3	4.1	5.6	5.8	5.1	4.3
Above G. P.	1.1	1.8	1.7	1.2	2.1	.9	.4	.6	1.9	1.1
Expectancy	.5	1.2	.2	.9	1.0	.6	-.3	-.1	1.1	.3

October, 1958

Group Mean 4.5
Group Median . . . 4.4
Group Expectancy . .54

Reading	5.6	6.2	6.1	5.5	7.6	5.7	5.4	5.9	5.7	5.6
Arithmetic	5.8	5.4	5.8	5.4	5.4	4.9	4.5	4.9	5.7	5.7
Composite	5.7	5.8	5.9	5.5	6.5	5.3	5.0	5.4	5.7	5.7
Above G. P.	2.0	2.1	2.2	1.8	2.8	1.6	1.3	1.7	2.0	2.0
Expectancy	1.3	1.1	.5	1.4	1.6	1.2	.6	1.0	1.2	1.1

April, 1959

Group Mean 5.7
Group Median . . . 5.7
Group Expectancy . 1.1

Reading	6.3	7.1	6.4	6.6	7.0	5.7	5.3	5.6	7.3	5.8
Arithmetic	5.9	5.0	6.1	5.8	4.9	4.6	5.4	5.0	5.7	5.9
Language	6.1	6.9	6.9	6.7	9.2	6.1	5.5	5.5	6.8	7.0
Composite	6.1	6.3	6.5	6.4	7.0	5.5	5.4	5.4	6.6	6.2
Above G. P.	1.9	2.1	2.3	2.2	2.8	1.3	1.2	1.2	2.4	2.0
Expectancy	1.0	1.2	.5	1.7	1.4	.8	.4	.4	1.4	1.0

October, 1959

Group Mean 6.1
Group Median . . . 6.3
Group Expectancy . .98

Reading	7.1	8.9	8.8	7.7	9.5	6.8	6.5	*	7.8	6.8
Arithmetic	6.4	7.8	9.2	6.2	7.4	5.5	6.1	*	6.9	6.2
Language	7.9	8.3	9.7	8.6	9.4	6.5	6.2	*	7.4	8.5
Composite	7.1	8.3	9.2	7.5	8.8	6.3	6.2	*	7.4	7.2
Above G. P.	2.4	3.6	4.5	2.8	4.1	1.6	1.5	*	2.7	2.5
Expectancy	1.5	2.7	2.7	2.0	2.7	.8	.6	*	1.7	1.5

April, 1960

Group Mean 7.6
Group Median . . . 7.4
Group Expectancy . 1.8

I. Q.	124	124	123	122	120	120	120	120	115	114
C. A. (April, 1960)	113	113	122	111	120	112	115	115	119	120

* moved

TEST RESULTS FOR GROUP II, SECTION M
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	BJ	BD	VC	MJ	FB	MJ	RN	CS	BJ	MD
Reading	5.1	3.5	3.7	4.7	4.3	3.3	3.8	4.2	4.6	4.4
Arithmetic	3.8	4.1	3.2	3.6	3.1	3.3	3.8	3.5	4.2	3.4
Composite	4.5	3.8	3.5	4.1	3.9	3.3	3.8	3.9	4.4	3.9
Above G. P.	1.3	.6	.3	.9	.7	.1	.6	.7	1.2	.7
Expectancy	.1	-.7	-.1	-.3	.4	-.2	.4	.5	0	-.1

October, 1958

Group Mean 3.9
Group Median . . . 3.9
Group Expectancy . 0

Reading	6.0	5.6	5.8	4.7	4.9	5.0	5.9	5.1	5.7	5.8
Arithmetic	5.4	5.6	4.3	4.3	4.5	4.4	4.7	3.8	5.2	4.9
Composite	5.7	5.6	5.1	4.5	4.7	4.7	5.3	4.5	5.5	5.3
Above G. P.	2.0	1.9	1.4	.8	1.0	1.0	1.6	.8	1.8	1.6
Expectancy	.6	.3	.9	-.6	.5	.6	.3	.5	.6	.8

April, 1959

Group Mean 5.1
Group Median . . . 5.2
Group Expectancy . .45

Reading	7.8	5.1	4.8	4.7	6.0	4.5	5.0	4.4	7.0	6.3
Arithmetic	6.0	5.7	5.0	4.6	4.8	4.2	5.2	3.7	5.0	4.6
Language	7.2	3.4	3.9	4.9	4.8	5.2	4.0	4.6	5.5	6.0
Composite	7.0	4.7	4.6	4.7	5.2	4.6	4.7	4.2	5.8	5.8
Above G. P.	2.8	.5	.4	.5	1.0	.4	.5	0	1.6	1.6
Expectancy	1.4	-1.2	-.3	-1.0	.4	-.2	-.9	-.3	.2	.6

October, 1959

Group Mean 5.1
Group Median . . . 4.7
Group Expectancy .- .27

Reading	8.3	6.8	6.2	6.5	6.5	6.2	6.3	5.9	7.5	7.7
Arithmetic	7.0	6.8	5.9	6.7	6.3	5.2	6.3	4.8	6.2	5.5
Language	8.9	6.4	4.9	5.1	4.6	6.9	6.0	5.9	5.9	6.2
Composite	8.1	6.7	5.7	6.1	5.8	6.1	6.2	5.5	6.5	6.5
Above G. P.	3.4	2.0	1.0	1.4	1.1	1.4	1.5	.8	1.8	1.8
Expectancy	1.8	.2	.2	-.2	.3	.6	.1	.4	.4	.8

April, 1960

Group Mean 6.3
Group Median . . . 6.2
Group Expectancy . .44

I. Q.	125	125	124	122	121	119	117	116	115	115
C. A. (Apr., 1960)	118	120	111	120	112	113	122	112	122	119

TEST RESULTS FOR GROUP II, SECTION F
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	KHS	LOJ	PRJ	MSS	RWJ	RHS	DPS	LWJ	JMS	PHJ
Reading	5.4	4.2	2.4	6.0	5.7	5.3	4.7	3.6	4.4	6.0
Arithmetic	4.2	5.6	3.1	6.0	3.2	4.7	4.3	3.5	3.6	4.5
Composite	4.8	4.9	2.8	6.0	4.5	5.0	4.5	3.6	4.0	5.2
Above G. P.	1.6	1.7	-.4	2.8	1.2	1.8	1.3	.4	.8	2.0
Expectancy	1.0	.2	.2	1.4	-.2	.9	.4	-.3	-.4	1.5

October, 1958

Group Mean 4.5
Group Median . . . 4.7
Group Expectancy . .47

Reading	5.4	6.0	5.5	6.0	6.0	5.9	5.9	5.9	5.4	6.0
Arithmetic	5.2	5.4	5.3	6.0	5.7	5.7	5.8	4.7	4.9	6.0
Composite	5.3	5.7	5.4	6.0	5.9	5.8	5.9	5.3	5.2	6.0
Above G. P.	1.6	2.0	1.7	2.3	2.2	2.1	2.2	1.6	1.5	2.3
Expectancy	.9	.3	2.2	.7	.7	1.1	1.2	.9	.2	1.7

April, 1959

Group Mean 5.7
Group Median . . . 5.8
Group Expectancy . .99

Reading	6.3	6.6	4.6	7.4	5.8	6.8	6.0	4.5	4.3	6.0
Arithmetic	4.6	5.5	5.3	7.0	5.4	6.5	4.6	4.7	5.1	5.6
Language	5.6	5.7	4.1	7.2	4.5	6.8	6.0	4.4	4.5	7.3
Composite	5.5	5.9	4.5	7.2	5.2	6.7	5.5	4.5	4.6	6.3
Above G. P.	1.3	1.7	.3	3.0	1.0	2.5	1.3	.3	.4	2.1
Expectancy	.2	0	.7	1.3	-.6	1.2	0	-.5	-1.0	1.4

October, 1959

Group Mean 5.6
Group Median . . . 5.5
Group Expectancy . .27

Reading	7.5	*	6.5	8.7	6.8	7.8	8.6	5.9	7.3	7.7
Arithmetic	6.8	*	7.5	8.0	4.8	7.2	6.6	5.4	6.1	6.8
Language	6.3	*	4.2	9.6	5.8	8.2	6.9	5.2	6.6	7.7
Composite	6.9	*	6.1	8.8	5.8	7.7	7.4	5.5	6.7	7.4
Above G. P.	2.2	*	1.4	4.1	1.1	3.0	2.7	.8	2.0	2.7
Expectancy	1.3	*	1.7	2.3	-.6	1.8	1.5	-.1	.6	1.9

April, 1960

Group Mean 6.9
Group Median . . . 6.9
Group Expectancy . 1.15

I. Q.	125	124	124	122	119	118	118	117	117	114
C. A. (Apr., 1960)	112	121	111	122	122	119	119	116	122	117

* moved

TEST RESULTS FOR GROUP III, SECTION C
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	HVC	LL3	GV3	PTC	SCC	HAC	SP3	STC	WSC	PCC
Reading	4.4	3.2	3.6	4.2	3.0	3.0	2.9	2.9	3.1	2.6
Arithmetic	3.6	3.3	2.5	3.9	3.3	3.4	3.2	3.0	3.3	3.0
Composite	4.0	3.3	3.1	4.1	3.2	3.2	3.1	3.0	3.2	2.8
Above G. P.	.8	.1	-.1	.9	0	0	-.1	-.2	0	-.4
Expectancy	.5	0	-.6	.6	-.1	-.3	.4	.6	.9	-.5

October, 1958

Group Mean 3.3
Group Median . . . 3.2
Group Expectancy . .15

Reading	5.8	5.8	4.5	5.6	4.2	4.4	4.8	4.8	3.8	3.7
Arithmetic	5.3	4.5	4.2	4.8	4.4	4.8	4.5	4.2	4.6	4.0
Composite	5.6	5.2	4.4	5.2	4.3	4.6	4.7	4.5	4.2	3.9
Above G. P.	1.9	1.5	.7	1.5	.6	.9	1.0	.8	.5	.2
Expectancy	1.5	1.4	.2	1.1	.5	.5	1.5	1.2	1.1	0

April, 1959

Group Mean 4.7
Group Median . . . 4.6
Group Expectancy . .90

Reading	5.2	5.7	4.9	4.8	4.3	4.6	5.2	4.8	4.5	4.3
Arithmetic	4.4	4.1	4.0	4.7	4.5	4.1	4.8	4.1	4.9	5.3
Language	5.8	4.5	4.2	6.2	5.0	5.0	4.7	4.4	5.0	3.3
Composite	5.1	4.8	4.4	5.2	4.6	4.6	4.9	4.4	4.8	4.3
Above G. P.	.9	.6	.2	1.0	.4	.4	.7	.2	.6	.1
Expectancy	.6	.6	-.4	.6	.3	-.1	1.0	1.0	1.6	-.1

October, 1959

Group Mean 4.7
Group Median . . . 4.7
Group Expectancy . .51

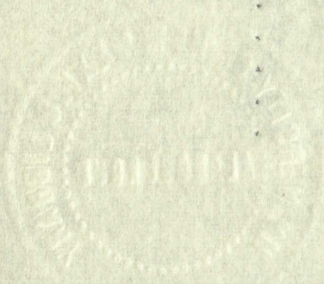
Reading	7.5	6.4	6.1	6.2	4.7	5.4	6.2	5.3	4.5	*
Arithmetic	7.0	5.7	5.1	5.7	5.2	5.9	6.9	6.0	5.2	*
Language	7.3	6.1	5.6	7.2	5.9	4.6	5.7	5.9	4.6	*
Composite	7.3	6.1	5.9	6.4	5.3	5.3	6.3	5.7	4.8	*
Above G. P.	2.6	1.4	1.2	1.7	.6	.6	1.6	1.0	.1	*
Expectancy	2.1	1.3	.5	1.2	.5	.2	2.1	1.8	1.1	*

April, 1960

Group Mean 6.0
Group Median . . . 5.9
Group Expectancy . 1.2

I. Q.	105	105	105	104	103	103	101	92	90	82
C. A. (Apr., 1960)	120	116	122	121	118	121	112	115	114	122

* moved



TEST RESULTS FOR GROUP III, SECTION M
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	GP	WM	MC	CL	US	BD	CM	MM	BH	LW
Reading	4.9	4.1	4.3	3.5	4.2	3.2	3.1	3.4	3.1	2.7
Arithmetic	3.5	3.4	3.5	3.6	3.9	3.3	2.4	2.9	3.3	2.7
Composite	4.2	3.8	3.9	3.6	4.1	3.3	2.8	3.2	3.2	2.7
Above G. P.	1.0	.6	.7	.4	.9	.1	-.4	0	0	-.5
Expectancy	1.2	.8	1.0	-.9	.4	.1	.1	0	-.1	-.1

October, 1958

Group Mean 3.5
Group Median . . . 3.5
Group Expectancy . .25

Reading	5.7	5.0	4.8	5.4	4.7	3.9	3.4	4.4	3.9	3.2
Arithmetic	3.6	4.0	3.9	4.6	4.7	3.9	3.6	3.9	3.9	2.6
Composite	4.7	4.5	4.4	5.0	4.7	3.9	3.5	4.2	3.9	2.9
Above G. P.	1.0	.8	.7	1.3	1.0	.2	-.2	.5	.2	-.8
Expectancy	1.1	1.0	1.0	.1	.5	.2	.2	.3	.2	-.4

April, 1959

Group Mean 4.2
Group Median . . . 4.3
Group Expectancy . .42

Reading	4.4	4.4	4.9	4.6	5.7	3.3	3.2	3.4	3.2	3.4
Arithmetic	5.0	3.7	4.9	4.6	4.2	4.1	3.5	3.3	3.8	3.7
Language	4.5	5.6	4.4	4.5	5.3	3.7	3.6	2.9	3.6	3.2
Composite	4.6	4.6	4.7	4.6	5.1	3.7	3.4	3.2	3.5	3.4
Above G. P.	.4	.4	.5	.4	.9	-.5	-.8	-1.0	-.7	-.8
Expectancy	.4	.6	.8	-.9	.4	-.5	-.3	-1.1	-.7	-.6

October, 1959

Group Mean 4.1
Group Median . . . 4.2
Group Expectancy .- .19

Reading	4.4	*	5.9	5.6	6.6	5.7	5.6	5.3	5.6	3.4
Arithmetic	5.9	*	5.3	5.3	5.5	5.5	4.0	3.5	6.0	4.2
Language	4.3	*	5.1	5.8	6.0	4.7	3.9	3.3	5.3	2.9
Composite	4.9	*	5.5	5.6	6.0	5.3	4.5	4.0	5.6	3.5
Above G. P.	.2	*	.8	.9	1.3	.6	-.2	-.7	.9	-1.2
Expectancy	.3	*	1.1	.3	.7	.6	.3	-.7	1.1	-1.1

April, 1960

Group Mean 5.0
Group Median . . . 5.3
Group Expectancy . .26

I. Q.	106	105	103	103	102	102	97	97	95	81
C. A. (Apr., 1960)	114	113	113	122	122	118	115	121	122	122

* moved

TEST RESULTS FOR GROUP LII, SECTION P
Third-Grade, 1958-59
Fourth-Grade, 1959-60

	DJJ	MES	MJK	MRS	MSS	VHS	KDS	DHS	HJJ	OLJ
Reading	3.5	4.4	4.3	5.4	4.7	4.2	4.4	3.1	2.5	3.5
Arithmetic	3.3	3.5	4.9	3.9	3.7	3.5	2.7	3.3	1.7	3.2
Composite	3.4	4.0	4.6	4.7	4.2	3.9	3.5	3.2	2.1	3.4
Above G. P.	.2	.8	1.4	1.5	1.0	.7	.3	0	-1.1	.2
Expectancy	0	.9	1.4	.9	.7	.6	.1	-.1	-1.3	.6

October, 1958
Group Mean 3.7
Group Median 3.7
Group Expectancy . .38

Reading	5.3	5.4	5.3	5.5	5.6	5.4	5.5	4.1	3.4	5.5
Arithmetic	4.9	4.7	4.2	5.0	4.6	5.0	4.7	4.1	3.6	4.0
Composite	5.1	5.1	4.8	5.3	5.1	5.2	5.1	4.1	3.5	4.8
Above G. P.	1.4	1.4	1.1	1.6	1.4	1.5	1.4	.4	-.2	1.1
Expectancy	1.2	1.4	1.1	1.0	1.1	1.4	1.2	.4	-.1	.6

April, 1959
Group Mean 4.8
Group Median 5.1
Group Expectancy . 1.03

Reading	5.1	3.9	6.7	5.1	5.6	3.8	5.9	3.2	2.8	4.1
Arithmetic	4.0	3.3	4.1	4.5	4.0	3.9	4.5	3.8	3.7	3.4
Language	4.1	4.7	6.2	5.0	4.8	5.5	4.2	3.6	2.8	3.8
Composite	4.4	4.0	5.7	4.9	4.8	4.4	4.9	3.5	3.1	3.8
Above G. P.	.2	-.2	1.5	.7	.6	.2	.7	-.7	-.9	-.4
Expectancy	0	-.2	1.5	.1	.3	0	.5	-.7	-1.0	.1

October, 1959
Group Mean 4.4
Group Median 4.4
Group Expectancy . .06

Reading	6.3	5.6	6.4	6.8	6.7	6.9	7.3	5.6	5.0	5.3
Arithmetic	5.7	6.7	6.1	5.9	4.9	5.4	5.1	6.0	4.5	4.9
Language	5.6	4.6	7.0	6.2	5.6	6.8	5.2	5.3	4.0	5.9
Composite	5.9	5.6	6.5	6.3	5.7	6.4	5.9	5.6	4.5	5.4
Above G. P.	1.2	.9	1.8	1.6	1.0	1.7	1.2	.9	-.2	.7
Expectancy	.9	.9	1.7	.9	.6	1.6	1.0	.9	-.1	1.1

April, 1960
Group Mean 5.8
Group Median 5.8
Group Expectancy . .95

I. Q.	105	105	105	104	104	103	101	95	86	84
C. A. (Apr., 1960)	118	115	116	122	120	118	120	122	122	122

COMPOSITE SCORES FOR ALL GROUPS
1958 - 1960

	GROUP I			GROUP II			GROUP III		
	C	M	P	C	M	P	C	M	P
Reading	5.4	5.0	5.6	4.9	4.1	4.8	3.3	3.7	4.0
Arithmetic	4.1	4.0	4.6	4.0	3.6	4.3	3.3	3.3	3.4
Composite	4.7	4.5	5.3	4.5	3.9	4.5	3.3	3.5	3.7
Above G. P.	1.5	1.3	2.1	1.3	.7	1.3	.1	.3	.5
Expectancy	.1	-.4	.3	.5	0	.5	.2	.3	.4
October, 1958 Third-Grade									
Reading	6.3	5.6	6.2	5.9	5.5	5.8	4.7	4.1	5.1
Arithmetic	5.7	5.1	5.6	5.4	4.7	5.5	4.5	3.9	4.5
Composite	6.1	5.4	5.9	5.7	5.2	5.7	4.7	4.2	4.8
Above G. P.	2.4	1.7	2.2	2.0	1.4	2.0	1.0	.5	1.1
Expectancy	.6	-.2	.3	1.1	.5	1.0	.9	.4	1.0
April, 1959 Third-Grade									
Reading	7.5	6.8	7.3	6.3	5.6	5.8	4.8	4.1	4.6
Arithmetic	6.0	5.6	5.6	5.4	4.9	5.4	4.5	4.1	3.9
Language	7.3	6.6	6.9	6.7	5.0	5.6	4.8	4.1	4.5
Composite	6.9	6.4	6.6	6.1	5.1	5.6	4.7	4.1	4.4
Above G. P.	2.8	2.2	2.4	1.9	.9	1.4	.5	-.1	.2
Expectancy	1.0	.1	.4	1.0	-.3	.3	.5	-.2	.1
October, 1959 Fourth-Grade									
Reading	8.1	7.6	8.6	7.8	6.8	7.4	6.0	5.3	6.2
Arithmetic	6.9	6.6	6.7	6.9	6.1	6.6	5.9	5.0	5.5
Language	8.5	7.1	7.5	8.1	6.1	6.8	6.0	4.6	5.6
Composite	7.8	7.1	7.6	7.6	6.3	6.9	6.0	5.0	5.8
Above G. P.	3.1	2.4	2.9	2.9	1.6	2.2	1.3	.3	1.1
Expectancy	1.1	.4	.6	1.8	.4	1.2	1.2	.3	1.0
April, 1960 Fourth-Grade									
I. Q.	111	110	111	120	120	120	99	99	99
C. A. (Apr., 1960)	115	116	116	116	117	117	119	120	121

IMPORTANT!

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