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A Comparison of Underachievers and Normal Achievers at the Upper-Elementary and Seventh-Grade Level

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A COMPARISON OF UNDERACHIEVERS AND NORMAL ACHIEVERS AT THE UPPER-ELEMENTARY AND SEVENTH-GRADE LEVEL

by

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M. Nephi Manning

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INTRODUCTION

That each is born with differing capacities and potentials is self-evident. Both students and teachers should accept as their right and duty the task of bringing to full fruition these latent potentialities.

It is a cause of concern in the nation, among parents and teachers, and in later years among students themselves, that many of our youth fail to achieve that of which they are capable. This is a loss to society and a disappointment to the individual.

The purpose of this study is to add to the growing fund of knowledge concerning factors related to this important area of education and the relationship of these factors to life's fulfillment.

Statement of the Problem

This study was an investigation of the number of underachievers, the magnitude of underachievement, and some of the causes of underachievement of students at the upper-elementary and seventh-grade level in two Utah school districts, only one of which practiced ability grouping. Particular attention was paid to the third factor: causes which may be responsible for underachievement.

One phase of the study was devoted to a comparison of the number of underachievers and the magnitude of underachievement between the two districts in an effort to ascertain the effects of ability grouping on underachievement.

Hypotheses

All hypotheses were stated in the null form and comparisons were made within each district at each ability level and between the two districts at each ability level.

The following hypotheses were set forth:

1. There are no significant differences related to sex between boys and girls in regard to the following hypotheses.

2. There is no significant difference in (a) the number of underachievers, nor (b) in the magnitude of underachievement in the two districts surveyed.

3. Underachievers do not have significantly inferior study habits as compared with normal achievers.

4. There is no significant difference between the amount of emotional disturbance in normal achievers as compared with underachievers.

5. Underachievers, as compared with normal achievers, do not show a significantly smaller amount of achievement motives.

6. No significant difference exist between home conditions, including the socio-economic aspect and the parents' attitudes toward school, of underachievers as compared with normal achievers.

7. There is no significant difference in the health of underachievers as compared with normal achievers.

Definitions of Terms

Underachiever

Underachievement is defined as "academic achievement at a level below the one expected on the basis of the student's performance on general aptitude tests" (Good, 1959, p. 585). See the Procedure section for method of determing student's achievement and aptitude levels.

Normal achiever

For the purposes of this study, all students not classified as underachievers were placed in this category. No attempt was made to differentiate students who achieve beyond expectations, over-achievers. Detailed treatment of the characteristics of these two groups was not within the scope of this study.

The Need for Maximal Achievement

Examples of failures in recognition of individual differences--especially outstanding potentialities in students--are classic. Horne (1952, p. 269) listed a number of those who were misfits in early schools. The list included: Charles Darwin, Linnaeus, Napoleon, William Seward, Patrick Henry, Newton, Samuel Johnson, Swift, Wordsworth, Heinrich Heine, George Elliot, Walter Scott, Hegel, Byron, Huxley, Schiller, Lowell, Goldsmith, Wagner, Goethe, H. W. Beecher, W. C. Bryant, Emerson, Pasteur, Thackeray, Shelley, Daniel Webster, John Adams, Gladstone, Coleridge, James Watt, Hume, Herbert Spencer, Ibsen, and others.

In later years, as recognition of individual differences came to the fore, much research was done on the educational needs of youth and necessary conditions for learning. In recent years, stress has been placed on qualifying our educational system to equip students to meet changing conditions in an increasingly complex civilization.

Some of the goals of education and needs of youth, as listed by various organizations, were:

Commission on Reorganization of Secondary Education 1912	Educational Policies Commission 1938	Association of Secondary School Principals 1944	Harvard Committee 1945
(7 cardinal principles of education)	(4 goals of education)	(10 imperative needs of all American youth)	(Traits of mind of the educated person)
Good health	Self-realization	Health and physical fitness	Rational thinking
Good citizenship	Economic efficiency	Saleable skills	Communication of thought
Worthy use of leisure time	Civic responsibility	Aesthetic appreciation	Relevant judgment
Worthy home membership	Human relations	Respect for humanity	Discrimination among values
Command of fundamental processes		Purchase and use of goods	
Civic responsibility		Citizenship	
Vocational efficiency		Family living	
		Leisure time	
		Scientific appreciation	
		Rational thinking	

Students of education have also set forth the important conditions which must be present before effective learning can take place. A summation of these has been presented by Frandsen (1957) in his book, How Children Learn. The discussion treats: (1) sufficient mental maturity, (2) teacher-guidance, (3) practice, (4) perception of the

effects of each trial, (5) provision for transfer of training, (6) motivation, and (7) freedom from anxiety.

Also, there is coming to be some agreement among the theorists concerning just how learning takes place, and a substantial body of facts is emerging upon which there is some accord. Too, with our system of public schools, we have more students in school and for a longer period of time than any other nation on earth. But, there is much yet to be done before each person can attain full self-fulfillment through realization of the aforementioned goals. What remains to be done is to improve the quality of education. Buswell (1956) suggests three fruitful fields of research for educational psychologists: teaching students how to think, studies of personality characteristics, and studies of motivation.

Changes in modern living have increased the complexity of improving the quality of education. A few of these changes will be mentioned in following paragraphs. Too, many students who might more profitably spend their time in a vocational school are required by law to remain in the public schools, in contrast to European schools. Thus the heterogeneity of our classrooms has been increased, making it more difficult to meet the individual needs of the pupils.

The complexity of education has been increased over the last decade by a host of new factors which former educators did not have to deal with. Scientific and technological advances; the exploding population from unexpectedly high birth rates; the comparative nearness, in time, to formerly distant countries; the interdependence of men and nations; the upsurge of rival ideologies, especially communism; social changes; early dating and marriage; increased responsibilities of the

youth in military service; the greater amount of education needed on nearly any job--all comprise some of the large problems that confront education.

Other factors are: satellites; television; unexpected doubling of enrollment within the next ten to fifteen years; the greater amount of money needed, and its dwindling purchasing power; and more demands for what money could be available--due to increased demands from other agencies, such as the military, roads, and welfare. The curriculum gets quickly out of date. Our public-school-educated citizenry is more demanding, and our students need more education.

In view of these factors, Dr. Robert Bush (1961), of Stanford University, recently said, "We must turn this crisis into an opportunity. We must achieve an educational break-through."

Educators can no longer tolerate a system of education which does not permit each individual student to progress from level to level, and from grade to grade as fast as his academic achievement, social well-being, and health will permit. Research and careful experimentation, based on sound principles, are needed. When the answer is clear, then the schools should not hesitate to change and to move ahead with the goal of keeping sacred the dignity of the individual and bringing to pass as fast as possible the greatest self-fulfillment and fruition of each citizen. If each individual has been helped to reach maximal achievement, he will, on reaching adulthood, work cooperatively with his teachers to improve conditions for all children, youth, and mankind.

REVIEW OF RELATED LITERATURE

The review of literature in this study is divided into four parts. The first part deals with studies in grouping--including the history of grouping and types of grouping. The second section deals with studies of underachievement--including the environmental factors and the personal factors relating to underachievement. The third part reviews suggestions and recommendations for improvement of grouping programs, and the fourth part is an over-all summary of the related literature.

There is overlapping in some cases because of the close relationship between grouping and achievement.

Review of Studies in Grouping

History of grouping

Cook (1958) gave a historical perspective to grouping. Plans were devised in the early part of the Nineteenth Century to make assembly-line educational procedures operate successfully. Memory work, examinations, goals, and educational progress were measured in terms of textbook items completed. Cook stated that

> the basic assumption underlying textbook procedure is that pupils can be classified into homogeneous groups and taught uniform material by a standardized procedure. The textbook has a place in education, but these assumptions inhibit the process of making "schooling" truly educational. (Cook, 1958, p. 249)

Some of the early steps toward homogeneity were characterized by graded textbooks, such as McGuffey's Readers, which were published in 1837. The first eight-room building, or graded elementary school,

came in 1848. All schools were graded by 1870, and achievement based on textbooks became the basis for promotion.

The methods of handling individual differences included all forms of acceleration and retardation. XYZ grouping of students through group intelligence tests came by 1920. Grouping by achievement and teachers' marks followed. By 1936 the practice was so prevalent that the NSSE made a critical evaluation of grouping in its Thirty-fifth Yearbook (1936).

Cook named and described some of the panaceas for variability recommended and adopted in the early years of the century:

> In some schools an attempt was made to hold standards constant and to get uniformity of achievement by increasing the amount of instruction for the slow pupils, as in the Batavia Plan, the Assisting Teacher (Teacher-Aide) Plan, and the Vacation-Classes Plan. Other schools received recognition by holding the course of study constant and differentiating the amount of time required for slow, medium, and fast-learning pupils, as in the North Denver Plan, the Cambridge Plan, and the Portland Plan. Other schools got their names in print by holding time constant, and differentiating the course of study for slow, medium, and fast-learning pupils, as in the Santa Barbara and Baltimore plans. Still other schools tried dividing the course of study into units of specified activities and achievement, permitting each pupil to advance at his own rate in each subject, as in the Pueblo Plan, the Winnetka Plan, and the Dalton Plan. (Cook, 1958, p. 252)

In 1947-48, Otto (1953) reported that 53 per cent of 1,598 city school systems were using ability grouping in some form in one or more schools. The per cent of cities using ability grouping ranged from 72 in cities of more than 100,000 population to 44 in cities of 2,500 to 5,000 population. The report did not indicate whether ability grouping in these cities was used in elementary or secondary schools.

A nationwide sampling of school administrators was made by The Nation's Schools (1955) in regard to the question: Should children be grouped through the early years on the basis of ability rather than

according to the typical age-grade system? The opinion of the administrators was indicated by a 60 to 40 split--with the majority against the idea. Those who favored ability grouping pointed out that it was more likely to give the outstanding pupil the attention he might otherwise miss. But, they said, it probably works better where there is superior teaching and in larger cities where generally there is less parental friction than in small towns. Many of those who favored the traditional age-grade grouping had no objection to ability grouping within the classroom, but some suggested that ability grouping is completely wrong--that all pupils learn from dealing with others of contrasting ability. One superintendent said, "Our life is mixed with both types, and certainly we must learn to understand both groups."

According to this opinion poll, six of the ten superintendents would keep traditional age-grade groupings. Opposition of parents was also reported as being a factor deterring ability grouping.

Eales, Reed, and Wilson (1955) surveyed the grouping practices in 42 secondary schools of Los Angeles County and found that 36 used some kind of ability grouping. The investigators noted a marked increase in classes for mentally retarded and, to a lesser extent, for gifted children.

In a review of over 600 Western schools, Vredevoe (1955) found pupils grouped in the following ways:

39 per cent were classified or grouped through a composite of these factors: intelligence, achievement, chronological age, maturity, and social adjustment

11 per cent according to ability

18 per cent on social adjustment and maturity

32 per cent on chronological age

Grouping continues to be the object of close scrutiny. Borg (1958) described the more recent situation:

> The ability grouping system has for many years held out a possible solution to such problems as making maximum use of available educational facilities, obtaining more efficient teaching from the many inadequately trained teachers now in the classroom, and providing a program that recognizes and is adaptable to individual differences in an economically feasible manner. In spite of the promises held out by ability grouping, relatively few schools are currently using this technique. This is partially because there has been no major research that has demonstrated that ability grouping does the things claimed for it by its proponents. Research that has been conducted has usually been concerned with only one aspect of the ability grouping situation--academic achievement. The available research evidence generally supports the contention that ability grouping results in greater achievement, particularly among superior students.
>
> These findings, however, have had little effect upon critics of ability grouping because ability grouping has generally been criticized on grounds other than achievement. It is the belief of the principal investigator that an extensive long-term study of all outcomes of ability grouping as compared with heterogeneous grouping could provide valuable information to the many administrators who are considering ability grouping as a possible solution to some of the pressing problems in today's schools. The lack of agreement among authorities, the confusion of teachers in the field, and the emotional flavoring of most of the published material concerning the question of ability grouping all tend to underline further the necessity for research in this field. (Borg, 1958, p. 1)

Types of grouping

Many different approaches have been tried in an attempt to allow for the variability in students. The task is so complex because the more adequately we meet the needs of all pupils, the more heterogeneous the groups become. The range of individual differences is greater than generally realized.

Cook (1958) stated that random six-year-olds will range from four to eight years of age in ability, and that in the typical

sixth-grade class may be found a range of approximately eight years. He stated that in any grade above the primary level will be found the complete range of elementary school achievement.

> It is time the public learned the facts. The range of ability in the classes of the elementary and high school is so great that if the slow learner in the eighth grade were demoted to the fourth, he would still be a slow learner in the fourth, and below the median of the class. If the top pupil of the fourth grade were accelerated to the eighth, he would still be a bright student in the eighth, and above the median of that class. (Cook, 1958, p. 254)

McElwee (1933), in studying homogeneous grouping of retarded pupils, found that the arithmetic achievement of 50 per cent of the entire group of 2,225 children exceeded their reading achievement from two to six times. Their average teaching difficulty was approximately two units. Fifty per cent of a group homogeneously graded according to mental age and reading achievement would be so heterogeneous as to arithmetic achievement that their instruction as a group in arithmetic would present serious teaching difficulty.

The task is further complicated because student abilities vary from subject to subject and one initial grouping does not suffice for all the subjects he must learn. A few of the many types of grouping tried around the 1920 decade were mentioned briefly in the History of Grouping discussion. Other typical factors used as a basis for grouping--chronological age grouping, wider age-range grouping, reading ability grouping, grouping by elective courses, ability and achievement grouping, friendship grouping, etc., will now be discussed.

Chronological age grouping and wider age-range grouping

Traditionally, children have been grouped by chronological age. This is so common among us that one tends to forget that it is still

grouping. Variations of this generally accepted procedure have been advocated by DeLong (1938) and evaluated by Bennett, et al. (1953). The basic idea was a flexible rate of progress in a wider age-range grouping. For example, students in the usual fifth and sixth grades might be combined into a common unit. Each child progresses through this block at his own rate. This may require as little as one year, or as much as three years. Within the block there would be several levels of ability--perhaps as many as six. Advancement to a higher level would depend upon mastery of the preceding level.

Polkinghorne (1950) sent out questionnaires from the laboratory school at the University of Chicago to find how many schools held combined classes and what school people were thinking about grouping children in school. The advantages for combined grouping were listed as (1) social values, and (2) improvement of learning skills--especially of the younger children. The disadvantages were listed as (1) parental opposition, (2) difficulties in making up a schedule, and (3) appointing leadership to the older students. According to the questionnaire, both the older and the younger students liked the arrangement.

Conclusions of 18 of 43 schools listed the following:

1. Dual grouping is not a factor for failure or success.
2. A gain was shown in achievement.
3. Combined groups caused dissatisfaction among teachers.
4. Children were more relaxed without a grade barrier.
5. Parents showed increased approval as time passed.
6. Combined groups are a definite advantage. (Polkinghorne, 1950, p. 508)

Reading achievement

Abbott (1944) included a standardized test in reading comprehension as a basis for grouping. Hartill (1936), Kefauver (1929),

Martin (1942), McElwee (1933), Ramey (1956), Vredevoe (1955), and Floyd (1954) all indicated that reading has been used, at least in part, for the selection of groups when ability grouping has been practiced.

Elective courses

In the junior high school, students are often permitted to select some of their subjects from among classes such as foreign languages, typing, general business, journalism, speech, photography, electronics, band and orchestra, art, chorus, office training, and library training. These offer a small measure for grouping. Students of course, have little opportunity for elective courses in the elementary school.

In the senior high school, opportunities for elective courses are greatly expanded. Some subjects, such as higher mathematics, provide a type of natural selection on an ability basis. Although this type of grouping has the advantage of student and parental acceptance, it has been the object of criticism by some. Chavoor (1955) indicated that its possibilities have been limited because of parental pressure, and because in history and English classes the students have been enrolled in direct competition with students interested in meeting college requirements. "The net result," says Chavoor, " has been a system of 'natural failure?'" Guidance in selecting courses is thought to be necessary, as parents are still prone to have their youngster in the so-called "white collar" program.

Chavoor recommended that two college preparatory classes, Spanish and algebra, be offered in the ninth grade of the junior high school to carry out the exploratory purpose of the junior high school. Exploratory Spanish and exploratory mathematics might also be offered to carry out

this exploratory function for slower students, give good review, give opportunity to develop interests and aptitudes, and "forestall failure" to a period in which the student is more mature.

On the high school level (grades ten, eleven, and twelve), he suggested that the effort to forestall failure might lead to the division of the history and English classes into either "college" or "vocational" sections. Also, a special "slow" section might be set up in English and history on the sophomore and junior levels. It was thought that this two-pronged attack would provide a positive approach for those who become disinterested in school and assist the gifted in avoiding mediocrity.

Ability grouping and achievement grouping

Intelligence, mental age, achievement scores, and expected age-grade placement, and/or combinations of the above seemed to be some of the more common bases for grouping. Chruckshank (1958) considered intelligence, mental age, and chronological age. Hunt (1942) divided groups on the basis of a group intelligence test. Klinge (1954) described the gifted as the upper 1 to 2 per cent of the population in intelligence.

We find grouping also for the mentally retarded. Wortis (1958) stated that mentally retarded children cannot be treated as other "sick" children, but that the child with a disability which is basically incurable should be helped to make the most of his assets with techniques which we now, broadly speaking, describe as rehabilitation techniques. This child does not need an I.Q. pinned on him, but a complete diagnostic evaluation by a series of appraisals by pediatricians, neurologists,

psychologists, speech therapists, psychiatrists, social workers, and others. The results of these tests and appraisals will help the teacher guide children who need special consideration.

Abbott (1944), to find a successful method for use in grouping pupils, used a combination of a four-point system based on (a) a standardized test in reading comprehension, (b) a similar device to measure arithmetic reasoning, (c) the I.Q., and (d) the subjective-objective estimate of the sixth-grade teacher relating to the ability of the pupil.

Organizational plans for grouping generally fall into two categories--multiple track or individual instruction plan. In the multiple track plans, pupils are promoted according to their achievement in the track to which they are assigned. The grouping is flexible, and students can move from track to track according to their needs. Examples of this type are the Cambridge, Baltimore, St. Louis, Santa Barbara, and Detroit XYZ plans. The Winnetka and Dalton instruction plans are samples of the individual instruction plans.

In the Winnetka plan, the student is given individualized instruction in the common essentials. There are many group and creative experiences which have socialization goals.

In the Dalton plan, the subject matter is divided into units covering about three to four weeks each. They are assigned according to the children's ability. The child may work in the unit (or contract) at any time, but must finish all units in the allotted time.

Kefauver (1929) evaluated a number of bases for grouping:

1. The most significant single source of information for predicting success in the first year of junior high school is the judgment of the teachers in the elementary school.

2. The general intelligence test is the most accurate of the tests in predicting general success, but it is superceded by special achievement tests for predicting success in individual subjects.

3. The general achievement test covering the content of a number of subjects gives a high relationship with general success.

4. For special grouping in each subject, special achievement tests related to content should be used. (Kefauver, 1929, p. 113)

Holmes and Harvey (1956) compared two methods of grouping, permanent and flexible, in terms of their effect on arithmetic achievement and found few significant differences in learnings or attitudes. They suggested that rather than to argue unproductively that one method is better than another, each teacher should analyze his own class and make provisions for differences in ways which will best meet his needs.

Comparing the achievement of a group selected on the basis of high intelligence with another chosen on the basis of high interest in language arts, and finding that the latter exceeded the former, Lazarus (1955) concluded that grouping by interest at the secondary-school level was sound.

Lawson (1957) analyzed grouping from a historical and philosophical approach:

> The perennialist-idealist, therefore, will best serve his own stated objectives of education by frankly admitting that there are no sacrosanct elements of education: for the only sacred thing in the school is the child.
>
> No one, more than the pragmatist, insists upon the democratic concept in education, its organization and its administration. It would seem that the pragmatist, then, would be attracted to a system which attempts to measure each child's potential and to place him in a group whose progress and capacities are consistent with that potential.
>
> More perhaps than anyone else, the realist has recognized the better possibilities of homogeneous grouping. (Lawson, 1957, pp. 259-61)

Lawson stated

1. Homogeneous grouping is not necessarily undemocratic. Education in a democracy should mean provision for each child to achieve at

his own best level in accordance with his own individual potentials. It is no more "democratic" to consider all children as having equal learning capacities and mental potentials than it would be to insist that all children have feet of the same size and must be given shoes that are exactly alike. He feels that major research supports individual differences.

> Homogeneous grouping actually is an attempt to recognize each child's democratic right to an education that he can handle, to an education that will help him individually to achieve his own maximum of self-realization, happiness, and effective growth. Homogeneous grouping is the very antithesis of an autocratic regimentation and imposed uniformity.
>
> Intelligent clinical studies of children show that some need one dietary regimen while others need a different prescription. The same fact is true in educational prescription. No one accuses the medical prescriptionist of being undemocratic! The very heart of democracy in education is the determination to measure each child's weaknesses and strengths--and to see that the requirements and the opportunities are consistently tailored to his needs. Properly conducted and with adequately skilled guidance, homogeneous grouping is a step in this direction. (Lawson, 1957, p. 266)

2. Homogeneous grouping is not impossible. It does not imply that children are identical. It implies that they are alike, or that their potentials are highly similar.

> Scientific grouping requires a diagnostic approach to the study of the individual. Such study must determine important facts about the child's (a) apparent mental ability, (b) special aptitudes, (c) basic social drives, (d) physical and emotional maturity, (e) educational age in the various learning areas, (f) health, (g) nervous stability, (h) personal and family history and attitudes, and (i) inter-personal adjustment factors. (Lawson, 1957, p. 267)

3. Intelligent grouping is not necessarily rigid and permanent. Many opponents of homogeneous grouping appear to see it as a system which permanently assigns a child to a specific classification from which there can be no escape. But under intelligent operation, it is similar to the familiar plan used by any good teacher of beginning reading--breaking the

class into small groups, some of which are more advanced than others. The sole purpose is that of seeing that each child works at his own best level. When his progress justifies his being moved to a more advanced group, the teacher quietly shifts him.

On a larger scale, Lawson indicates that over-all ability grouping attempts to accomplish the same result in each area of study. The learner may be shifted, say, from a slow group in mathematics to a more advanced group in that subject while remaining perhaps with a slow group in social studies or English. Flexibility is limited only by administrative feasibility. A learner might under these conditions be placed temporarily in a slow group to receive remedial help following a period of illness.

4. Homogeneous grouping does not maladjust the child. Research in general shows that children tend to gravitate toward contacts with other children of similar mental and intellectual levels. With his peer group he finds success. Being with others with whom he cannot compete is more apt to cause maladjustment, for here he meets constant failure.

5. Homogeneous grouping can offer each child an optimum challenge for his best abilities. The gifted child may become bored in the heterogeneous group whose range of abilities extends far below his own. Teachers tend to pace the work to averages.

Lawson concludes:

> Perhaps the school today, faced with the desperate need to cultivate the talents of its superior students, should take a second and very thoughtful look at the possibilities for homogeneous grouping. (Lawson, 1957, p. 269)

Ramey (1956) developed a study of grouping practices at a school in Los Angeles to determine how grouping could best be used for effective learning. The pattern used was to group each grade level by ability,

determined primarily by expectancy and reading grade scores, giving consideration to the recommendations of teachers and counselors. Each grade was divided into sections of 30 to 35, and the groups were labeled A, B, C, etc., the letters continuing as far as necessary to take care of the groups. This grouping didn't include the low intelligence group who were programmed separately.

The conclusions of the study were:

1. It was found that there is no truly homogeneous group.
2. It was felt that four groups would be best.
   a. Fast moving group.
   b. Regular or average group.
   c. Slow or remedial groups.
   d. Special training groups for those under 75 I.Q.
3. Grouping within the class is still necessary.
4. Grouping on the basis of reading doesn't necessarily coincide with ability in reading.
5. There must be continuous re-evaluation. (Ramey, 1956, p. 290)

The findings were:

> All of the groups showed a concentration around the median, but the grouping itself was not as marked or significant as the range of scores within each group. On the range of test scores, there was almost complete overlapping of all groups except the lowest. As the pupils had been grouped according to expectancy and reading placement, these, of course, showed the greatest bunching of scores around the median. The others approached a normal curve. (Ramey, 1956, p. 291)

Other types of grouping

Harrah (1955) studied the effectiveness of five kinds of grouping on achievement and social behavior of students. Forty teachers and 1,117 students participated in the study. The five kinds of grouping were equally distributed in relation to the number of classes, and eight teachers participated in each of the kinds of grouping.

> The results of the study revealed that friendship grouping gave better results on achievement and social behavior. Interest grouping rated second and ability grouping rated third. Ability grouping did not appeal to the majority of the students involved.

Arbitrary and alphabetical grouping were weighted heavily toward unsatisfactory results.

The major findings of this study regarding the effectiveness of the five kinds of grouping revealed that:

1. A close relationship existed between students' opinions and comments and the total results of satisfaction within the kinds of grouping used.
2. Friendship and interest grouping showed close consistency in achievement for grades eight and nine as measured by the metropolitan achievement tests.
3. Teachers' marks were more consistent in grades seven, eight, and nine with friendship grouping than with the other four kinds of grouping.
4. Grade seven showed less consistency between the teachers' marks and the metropolitan achievement tests for all kinds of grouping used than was revealed for grades eight and nine.

When all factors or measures used were considered, the five kinds of grouping were recommended in the following order as to the most effectiveness: friendship, interest, ability, arbitrary, and alphabetical.

Social behavior and achievement results were more conclusive for grades seven and eight than for grade nine.

The results of the evaluations of social behavior changes were more conclusive than the results of achievement changes. (Harrah, 1955, p. 715)

Blanchard (1953) suggested grouping and promotion according to the student's total behavior pattern.

Literature and research favorable to grouping

The review in this section will be divided into evidence for grouping and opinions and arguments for grouping.

Evidence for grouping

Riley (1956) experimented with grouping to see if it might aid the learning and teaching processes. The results of standardized tests, teacher judgment, and general achievement were used. Reading ability, creative ability, and I.Q. were also considered. The principal and the

teachers involved made the final decisions. They divided the students into four groups: (1) gifted, (2) high average, (3) low average, and (4) slow learners.

When standardized achievement tests were given near the close of the school year, the grade equivalents ranged from 6.5 to 10.5. The number of near perfect scores indicated more than usual progress. The results showed progress from 14 to 54 months. The class median was 17 months above the median shown in the first testing. In some areas, the median was 29 months higher.

The slower classes were able to achieve and were therefore happy. The social development of slower children being class officers was also significant. Sports were carried out without problems, all levels winning some games.

Success was thought to depend a great deal on teacher and principal attitudes and qualifications. All should realize the advantages and disadvantages of grouping.

Riley concluded that the gifted should be grouped when conditions are favorable. Under those conditions, they should be grouped for their own sake and for the sake of the added contribution they can make to the American way of life. By providing more adequately for the gifted, better provision is made for all other pupils in any one grade.

Rankin, Anderson, and Bergman (1936) endeavored to evaluate the effectiveness of three different instructional organizations that varied in degree and type of their adjustment to individual differences: (a) the Detroit plan grouped the pupils by half-grades and classified them as X, Y, or Z; (b) the mass instruction plan was used to teach all pupils the same way, with no attempt being made to make the groups

homogeneous in pupil ability; (c) the vertical group plan utilized ability grouping beyond that used in the Detroit system. Children were classified as X, Y, and Z, and a special effort was made to make the classes homogeneous in brightness level, even though two or even three half-grades might have to be combined to make up a class. Data for about 500 pupils in each plan in grades three through six were presented.

Test results indicated that the vertical plan was 20 per cent superior to the Detroit plan, and still greater superiority was shown over the mass plan in reading. In arithmetic, results showed the Detroit plan was 14 per cent superior to the vertical plan, and even greater over the mass plan.

Theisen (1922) used the Illinois Intelligence Test to group VII-B students of varying ability. In some cases weight was given to previous school records. At the end of June, an effort was made to determine some of the achievements of the different sections in each school. The pupils were tested with the Stone Reasoning Test in arithmetic, Monroe Reading Test Form II, and the Charters Language Test. Quality of work was also considered.

The findings showed that the sections that made higher intelligence test scores in each school excelled in scholarship. Intelligence and achievement were correlated and found positive. The highest correlation was between intelligence and arithmetic; reading comprehension ranked next; language, third. The conclusions of the study were:

1. Grouping by ability is good.
2. Physically and mentally mature students should pass through school more rapidly.
3. Enrichment for middle class and a minimum program for the slow should be set up.
4. Achievement standards for the various groups should be set up.

5. More supervision is needed. (Theisen, 1922, p. 305)

Kraraceus and Wiles (1938) conducted an experiment in grouping for effective learning in the elementary schools of a Massachusetts school district. They found that one school was considerably below the others in achievement, and they set up a grouping experiment to find if grouping would solve the problem. On the basis of the Metropolitan Achievement tests and the judgment of the teachers, the students were classified into three groups, according to their achievement and apparent skills in reading, English, and arithmetic. Each group spent some time with the whole group. Added objective data was obtained from the Pressey Attainment Scales, administered city-wide. On retesting of achievement at the close of the 1937-38 school year, this grade in the experimental school rose from lowest in the district to fifth from the bottom. The conclusions of the study were:

> 1. With respect to academic achievement, the objective data indicates that more than the average pupil growth was made in the course of that year.
> 2. Because of the nine possible groups, the learner was more often met at his own ability and achievement level in each subject than by other methods used traditionally. At the same time, many of the values of heterogeneous grouping were maintained by the morning period and the social studies period being spent together. Long periods allotted to each subject matter field proved advantageous.
> 3. The grouping provided greater opportunity to guide the abler pupils to reach their potentialities and to plan a rich remedial program for the lowest group.
> 4. Since each teacher worked with all three achievement levels during the day, he was better able to keep his perspective of proper standards.
> 5. Departmentalism was avoided because each teacher guided learnings in all subject fields.
> 6. Wider social relationships were possible for both students and teachers.
> 7. Disciplinary problems were reduced.
> 8. Report card marks tended to be more fair since they represented three teachers' cooperative thinking. (Kraraceus, 1938, p. 268)

Research dealing with the social aspects of ability grouping is much less common in the literature. Studies reported are frequently inferior to the achievement studies in terms of design. Jackson (1943), studying students in the third and fifth grades, reported findings generally favorable to ability grouping. An interesting result of this research was his report that truancy in ability-grouped sections almost disappeared and behavior problems were reduced.

Martinson (1960) conducted a study project on programs for gifted pupils, from which data she concluded that special planning need not affect the gifted child adversely, whether he remains in the regular classroom or takes part in a special class. In this study his regular classmates did not regard him as a less desirable friend because special provisions were made for him.

In regard to achievement differences, when the experimental groups were compared to control groups on the basis of academic performance during the experimental year, ten out of twelve of the experimental groups were found to have made significant gains in mean scores.

> Final evidence of the quality of achievement to be found in the intellectually gifted is shown by the results of the Graduate Record Examination. During May, 1959, 75 seniors took the Area Tests of this examination in social science, natural science, and the humanities. On all three tests, the high school seniors made an average group score considerably beyond the average for college seniors. They compared closely with college students who had majored in the three subject areas for four years. In other words, they performed like those who had taken four years of college work, without the college experience. (Martinson, 1960, pp. 7-9)

Evaluations made by Bennett, et al. (1953) who did not cite objective data, said that students made satisfactory progress, showed

interest, made good emotional and social adjustment, recognized and accepted individual differences among themselves under ability grouping. Teachers became better acquainted with the children and intra-class grouping was facilitated.

Marsh (1955) reported "An Interesting Experience in Grouping" in the Culver City, California, High School. Grouping was accomplished through a screening process involving five factors:

A. Teacher rating
   1. The teacher rates a pupil by symbols of 1, 2, 3, 4, etc. No. 1 is the highest.
   2. The rating of pupils is done in the spring quarter in preparation for school in the fall.
   3. Each pupil is rated on every subject in the school.
   4. The teacher uses the following criteria to rate with:
      a. Scholastic achievement
      b. I. Q.
      c. Reading and mathematics achievement scores
      d. Emotional maturity
      e. Social adjustment
      f. Work habits
      g. Attitude toward school

B. Choice of electives. In the spring the students choose the elective subject they wish for the next year.

C. Choice of friends. Students who should not be scheduled together are listed.

D. Selection of teachers. A selection of the right teacher to be placed in the right class.

E. Scheduling restless pupils. English and social studies were scheduled during the first four periods. (Marsh, 1955, pp. 50-51)

The accomplishments of this study were:

1. The gap in the ability within any one class was not so wide but that it could be bridged by the teacher.

2. The classroom discipline problems were reduced to the lowest point since the Culver City Junior High School was started in 1949.

3. The teachers felt they were doing a better job of teaching.

4. The needs of the pupils were provided for much better.

5. The program helped to bring about higher teacher and pupil

morale.

6. The experiment proved that most of the children were challenged to put forth more effort.

Marsh's work tended to support Jackson's findings.

Opinions and arguments
for grouping

In a study of Justman and Wrightstone (1956) on the expressed attitudes of teachers in the New York City schools toward special classes for intellectually gifted children, contrary to the opinions of the older, inexperienced with intellectually gifted children classes, the younger teachers and teachers with intellectually gifted children (IGC) class experiences tended to maintain that:

1. The attitude in IGC classes was not too competitive.

2. Intellectually gifted children got better training for leadership in IGC than in a regular class.

3. Children of IGC classes tended to be above-average in social adjustment.

4. Children from IGC classes got along well with children from other classes in work and play situations.

5. Children enrolled in IGC classes did not tend to become conceited about their abilities.

6. More cooperation was received from parents of children enrolled in IGC classes.

Summary of arguments for grouping. The following arguments for grouping are summarized from the studies just preceding and from Blanchard

(1959); Dahlen (1961); Horner (1959); Morton (1959); Eales, Reed, and Wilson (1955); Gowan (1955); Wallin (1956); Tonsor (1953); and Cook (1958).

(Pupils)

1. Slow learners in separate groups are not discouraged by the superiority of others, but can compete on more equal terms and can develop their own leaders.

2. Children having more than average ability tend to form habits of idleness, inattention, and mental laziness if compelled to mark time with average or slow pupils; competition is keener and pupils are more likely to work to their capacity in a grouped situation.

3. Homogeneous grouping prevents low standards from dominating the whole group.

4. The attitude in intellectually gifted children classes is not too competitive.

5. Homogeneous grouping lessens pupil failure and discouragement and reduces the amount of retardation.

6. Homogeneous grouping adds to the happiness of children. The sting of failure and inferiority is removed.

7. Grouping contributes to improved work by the better students and reduces failures among the slower learners.

8. It provides greater challenge to students and thus contributes to a more efficient use of ability; it assists the more capable learner to perform closer to his level of ability and to progress more rapidly.

9. Slower students will no longer be frustrated by trying to achieve beyond their reach and a richer remedial program can be provided.

10. Homogeneous grouping usually provides groups which are more congenial and sociable.

11. Homogeneous grouping prevents the development of either inferiority complexes on the part of the dull, or superiority complexes on the part of the bright.

12. It provides students with more opportunity to develop leadership and feelings of personal adequacy.

13. Homogeneous grouping is democratic.

14. Children of intellectually gifted classes tend to be above average in social adjustment; they get along well with children from other classes in work and play situations.

15. Grouping contributes to a sense of belonging.

16. Fast students can better be prepared for college through an accelerated course.

17. Grouping will allow the boy to be able to pursue a vocational curriculum rather than a pre-college curriculum.

(Teachers)

18. Homogeneous grouping facilitates the work of the teacher because it enables him to adapt methods of teaching to meet the needs of individuals and groups of similar interests, abilities, etc.

19. By limiting the range of variation within a group, more time can be given to the individual pupil and the number of disciplinary problems are reduced.

20. Teachers may specialize in teaching a homogeneous group.

21. A goal within reach serves as an incentive.

22. Teachers become better acquainted with the children.

(Curriculum)

23. Homogeneous grouping makes differentiation of curricula easier.

(Administration)

24. Homogeneous grouping makes promotions far more flexible.

25. Homogeneous grouping is already an integral part of school practice.

26. Grouping on a basis of age and degree of maturity has been the pattern throughout the history of our schools.

27. More cooperation is received from parents of children enrolled in intellectually gifted children classes.

Literature and research unfavorable to grouping

As in the section preceding, a differentiation will be made between evidence and opinions and arguments.

Evidence against grouping

Abramson's (1959) report showed no statistically significant differences observed in any instance in the grade-point averages earned by high ability students who had been members of organized ability groups in their respective high schools and students who had not been grouped on an ability basis.

In regard to grades and I.Q., his report indicated that the overall achievement of students is associated with their level of intelligence, and not with the particular high school they attended.

Lorge and Mayans (1954) examined the achievement of migrant Puerto Rican pupils and found that challenging them to understand in a regular classroom had marked advantages over separating them into vestibule classes both for English mastery and for personal adjustment.

Rudd (1958) conducted a study on the psychological effects of streaming (grouping) by attainment. The experiment involved two groups, each of 90 pupils, entering the same selective school, at the age of eleven years. The control group was organized into three groups whose membership did not change during the two-year period following entering the school. The experimental group was organized into three streams (groups) and pupils were transferred between streams after each half-yearly examination.

The findings were:

1. Taken together, the results of the ability tests showed no significant differences between the groups attributable to the organization based on streaming.
2. The attitude tests toward examinations, school lessons and school life in general yielded no significant differences between groups.
3. The samples of classroom behavior revealed that in the group organized into streams fewer social contributions to lessons were made by pupils, that there was more aggressive behavior and less attention to work.
4. The estimates of personality made by the teachers revealed no significant differences between the groups. The pupils self-estimates revealed an extensive, but probably temporary, deterioration in personality following re-grouping.
5. Studies of several pupils indicated that the more lasting effects of transfer are a highly individual matter. No general long-term effects attributable to streaming were discovered. (Rudd, 1958, p. 47)

The conclusions were:

1. The attempts to increase the homogeneity of the streams by transferring pupils from one to another were unsuccessful.
2. The attainments of the pupils were no greater where the organization was based upon streaming than where it was not.
3. The transfers of pupils between streams had traumatic effects both upon the pupils transferred and upon the streams to which they

transferred, but that these effects were temporary.

4. The traumatic effects upon the pupils of the organization based upon streaming by attainment were apparently unnoticed, as such, by the teachers involved in the organization.
(Rudd, 1958, p. 60)

Luchins and Luchins (1948) conducted a study on children's attitudes toward homogeneous groupings. Every other child in the fourth, fifth, and sixth years of the elementary school was interviewed. The subjects, 190 in number, were called out of the classroom, one at a time, and brought to the teachers' lounge where the experimenter attempted to put them at ease. Discussion revealed that every pupil was aware of the significance of the superscript (1, bright; 2, dull; 3, average) attached to his class. The subject was told that the Board of Education was conducting a study to find out what kind of classes children prefer. In this study it was shown that many of the dull-class pupils appeared to feel inferior and ostracized. There was a decided stigma attached to the 2-class label and a strong social pressure to be in the 1-class. The brighter children, in turn, were on the whole, snobbish in their attitudes toward those in the 2-class. In brief, homogeneous grouping seemed to help create a kind of caste-system in the school. As there was no control group, it is possible that dull children also feel this way in heterogeneous classes.

Research by Mann (1957) showed that there was little real friendship between superior and average or below average students in heterogeneously-grouped classrooms. This suggests the possibility that some of the results obtained by Luchins and Luchins could be due to differences in ability rather than the grouping system per se. Mann compared the sociometric choices of 281 children, 67 of whom were classified as

superior or gifted. The students were from the fourth, fifth, and sixth grades. This study is discussed more fully on pages 42 to 44.

Opinions and arguments against grouping

Martin (1942), in his article "Ten Years of Ability Grouping," gave the experience of a junior high school principal who had administered ability grouping by achievement and intelligence quotient for ten years and felt that a mistake had been made and other methods should be tried. The practice has now been discarded in his school district. He listed the following as objections:

1. Too rigid.
2. Needs to be flexible enough to allow for remedial work.
3. Should be flexible enough to allow for social maturity of group.
4. Should be flexible enough to provide for leadership in each group.

Although this was not an experiment, and no concrete data substantiated his claims, his observations seemed to have worth and the ten-year duration of this study is in his favor.

In Justman and Wrightstone's (1956) study, both positive and negative results were recorded (see page 26). The expressed attitudes of the older teachers without experience in classes for intellectually gifted children (IGC) tended to be that too many children were placed in IGC classes who really did not belong there, that having small IGC classes was unfair to other teachers, and that parents tried to "pull strings" to get their children enrolled in an IGC class. The positive

results were given in the section devoted to opinions and arguments for grouping.

Summary of opinions and arguments against grouping. The following arguments against grouping are summarized from the studies just preceding, and from the same sources listed in "Summary of arguments for grouping," page 27.

(Pupils)

1. With homogeneous grouping the slower groups lose the stimulus and the contributions of the brighter pupils; outstanding leaders to inspire the others are lost.

2. The average or above-average pupil loses the opportunity of helping the dull child.

3. Pupils put in the lower ability groups sometimes develop a sense of failure and inferiority and are apt to feel jealous and resentful. Pupils put into higher ability groups are apt to develop a superiority complex.

4. "Segregation is a by-product of a planned society." It makes some people feel as if they are second-class citizens.

5. Homogeneous grouping is undemocratic and tends to create class distinctions.

6. A certain stigma is often attached to the lower groups; children in slower groups are marked as "dullards" or "dumbells."

7. Grouping on an ability basis puts pupils with poor social backgrounds together, whereas citizenship improves by association with higher types of pupils.

8. A highly competitive, tense atmosphere is sometimes created when students of the same or nearly the same ability are grouped together.

9. Segregation naturally limits to some extent the social growth of a student, and more than anything else a student wants to be on an equal social basis.

10. Fewer social contributions are made to lessons by pupils, there is more aggressive behavior, and less attention to work is given in grouped situations.

11. Transfers of pupils between groups often has traumatic effects upon both the pupils transferred and the other members of the groups.

12. The attainments of the students are no greater in a grouped situation.

13. Some pupils will deliberately do poor work in order to get into slower groups and therefore be required to do less work.

14. Ability grouping tends to prevent adequate training for meeting competition in out-of-school situations where people are not grouped by ability.

15. A heterogeneous group allows for a more normal social situation for elementary pupils.

16. An experience of slow children in a group of varied ranges of students provides a wholesome experience of realization of other's contributions to the world.

17. Cooperation is needed in the every-day world of business between people of different ability levels. Our schools provide for this only when we do not segregate according to ability level.

18. No challenge exists for foreign students to master English or make personal adjustment when grouped separately.

19. The bright pupil--the one who profits most from an educational environment--is eliminated from school first. He spends less time there; while the slow pupil who can profit least from an educational environment spends the most time there.

(Teachers)

20. The adjustment of teachers to the various groups is difficult.

21. The lighter load of small special classes, especially intellectually gifted children classes, is unfair to other teachers.

22. Few teachers succeed in adequately differentiating the materials of instruction for different levels.

23. There is a tendency for teachers to be complacent with low achievement in low groups.

24. Teachers are divided in their support of any particular system of grouping--particularly those assigned to teach slow groups.

25. Slow groups are more difficult to teach and discipline because of the concentration of problems in one class.

26. If teaching special groups is so important, a person should be specially trained for his or her level; yet because most teachers don't like to teach the slower classes, a rotation from year to year takes place.

27. Attention to individual differences is minimized in situations such as a "homogeneous group" where the teacher feels she can take a "flock shot."

28. An excess of retarded pupils in the upper grades aggravates the range of ability problems, and the variability of classes is as great as when universal promotion is practiced.

(Curriculum)

29. Homogeneous grouping offers no advantage to a school with an activity program and a correlated curriculum. It is only advantageous when a formal curriculum is followed.

(Administration)

30. It is very difficult to divide pupils into truly homogeneous groups, for what is more or less homogeneous in one subject may be completely heterogeneous in another; homogeneity is only relative.

31. Homogeneous grouping is sometimes misunderstood and resented by parents.

32. Homogeneous grouping complicates school administration by making the mechanics of promotion more difficult and contributing to scheduling problems.

33. Homogeneous grouping is impossible or difficult except in schools of considerable size.

34. Too many children are placed in intellectually gifted children classes who really don't belong there--sometimes through parental pressure.

35. Since all instructional groups vary widely in interests and ability, it seems wiser to attempt to develop techniques for meeting the needs in such groups instead of constantly striving for a homogeneity which cannot be achieved.

36. Grouping is too rigid; it needs to be flexible enough to allow for remedial work, to allow for social maturity of the group, and to provide for leadership in each group.

Review of Studies of Underachievement

This section will treat causation and identification of underachievers, achievement differences as related to subject matter and ability level, and opinions and suggestions for improvement.

Causation and identification of underachievers

The studies of underachievement reviewed have been divided into those dealing with environmental factors which might relate to underachievement--such as, family background and home conditions, occupational distribution of parents and social position, community and neighborhood environment, companions and age preferences, counseling procedures, teacher influence, and social acceptance--and into those dealing with personal factors which relate to underachievement--such as, identification, study methods, aspirations, self-concept, emotional disturbance, health, intelligence quotient, goals and achievement motives, interests, values, and occupational choices. The main emphasis of this study has been to investigate the accumulated or long-term influences that relate to underachievement, rather than to investigate temporary upsets which periodically lower learning performance.

Evidence relating to environment

Home conditions. In evaluating the influence home conditions have upon underachievement, it was found that parents' attitudes toward school and socio-economic conditions in the family are major factors dealt with in the literature.

The Goldberg study (1959), which will be described more in detail in the section on personality factors related to underachievement, pointed out that home environment is a contributing factor to underachievement. In the Goldberg experiment, a classroom climate was maintained where the students felt free to come to the teacher with personal, as well as with school problems. These personal contacts revealed the information that in many instances there were serious misunderstandings and poor relationships between boys and their parents which were related to school behavior.

Fliegler (1957) has already been quoted as stating that ". . . it is not too presumptuous to postulate that the underachiever is a maladjusted youngster." The next question one might ask is: What is the extent of this maladjustment? Is there a greater proportion of underachievers who develop mental illness than there is among normal-achievers. If this could be shown to be true, it would coincide with Hollingshead and Redlich's (1958) findings relative to social status and psychiatric illness. They concluded that

> 1. A definite association exists between class position and being a psychiatric patient.
> 2. The lower the class, the greater the proportion of patients in the population.
> 3. The greatest difference is between classes IV and V, in that Class V has a much higher ratio of patients to population than Class IV. (Hollingshead and Redlich, 1958, pp. 216-17)

A description of these five classes can be found in the data section on socio-economic conditions.

A study by Gibboney (1959), with respect to socio-economic status and achievement in social studies, used two groups of sixth-grade students: (a) one from the upper middle class (35 pupils--19 boys and

and 16 girls), and (b) one from the upper lower class (40 pupils--23 boys, 17 girls). Differences in intelligence were controlled by covariance in the analysis of the achievement test scores. He concluded that the first group achieved significantly higher than the second group, at the 5 per cent level of significance (Gibboney, 1959, pp. 340-346).

Support for Gibboney's findings may be inferred in a study project on programs for gifted pupils under the direction of Martinson (1960), project coordinator. From a sample of 929 pupils, 493 were in the first six grades, and 436 were in either junior or senior high school.

> At all grade levels, there were 478 boys and 451 girls. The mean I.Q. of the total group on the Revised Stanford-Binet Scale was 140.1. The socio-economic rating used was based upon the father's occupation. Two per cent of the pupils came from the lower socio-economic group, 48 per cent from the middle, and 50 per cent from the upper (professional-managerial). (Martinson, 1960, p. 2)

Two writings reported by Goldberg (1959) indicated that attempts to explain the discrepancy between measured intelligence and performance date back many years. Goldberg pointed out that:

> There is considerable evidence to suggest that social-psychological factors such as socio-economic status, ethnic and religious background, educational level of the family, stability of family structure, and availability of educational and occupational models in the home and in the community are related to achievement. (Goldberg, 1959, p. 1)

Companions and age preferences. Bedoian (1954) studied 743 pupils from 22 classes for the purpose of determining if a relationship existed between the social rejection or social acceptability of the underage, at age, and overage pupils in the sixth grade. Four sociometric test scores were given and combined, then weighted to determine social acceptability.

One sociometric test was given to determine social rejection. A summary of findings follows:

> 1. The underage pupil received significantly higher social acceptance scores, while the overage pupils scores were significantly lower than the at-age pupils. Pupils only slightly underage appear to enjoy higher status than pupils who are underage to a greater degree. It is important to note that in spite of the loss of acceptability by the extreme underage pupils, they still excel the at-age and overage children. It is evident from the present data that age determines social acceptance to a considerable degree. The data from class seventeen clearly shows that if the overage pupils are placed together they enjoy a higher degree of status than the overage pupils who do not make up a large share of the class.
>
> 2. The overage pupils appear to possess significantly higher rejection scores than the at-age or underage who are about the same.
>
> 3. A large per cent of underage students were "stars," while a large portion of overage were "rejectees." (Bedoian, 1954, p. 519)

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A sociometric study by Muggenthaler (1955) of 48 pupils of an elementary grade gives evidence that slow-learning pupils among them are rejected because of academic failure, while in special classes for slow learners, the rejection of a classmate is based on other, more personal biases. If this be the case, it would suggest the consideration of early transfer of slow learners to special classes to insure optimal adjustment (Muggenthaler, 1955, pp. 226-30).

Goldworth (1959) made a study of the effects of a fast-learner program on the social relationships of elementary school children in a San Francisco Bay area community. Pupils admitted to the study were from grades four through eight, whose I.Q.'s were 130 or higher on the California Test of Mental Maturity, or 120 or higher on the short form of the Revised Stanford-Binet. The subject areas included art, biological science, physical science, and social studies.

In each area, two groups were formed: grades four through six, and grades seven and eight. Four special teachers were employed, all

of whom were doctoral candidates in the School of Education at Stanford University, held a California Teaching Credential, and each was a specialist in one of the subject areas involved. A control and an experimental group was formed with 204 students in the experimental group and 211 in the control group.

Pre-measures and post measures used were (1) the Columbia Classroom Social Distance Scale and (2) three sociometric tests.

The purpose was to see if differences between children in the experimental classrooms and children in the control classrooms were significant in respect to change in their (a) acceptance of each other as friends, (b) acceptance as friends by their classmates, (c) acceptance of their classmates as friends, (d) group cohesion, and (e) subgroup preferences.

The findings were:

1. In their acceptance of each other as friends, the control group was accepted by their classmates to a significantly greater degree ($p < .001$). This may be accounted for by their being in a separate building for two 90-minute periods each week.

2. Control groups showed an increase in the degree to which they were accepted as friends by their classmates. The difference, however, was not significant.

3. At all grade levels, four to six and seven and eight, no significant differences were found between experimental and control fast-learners. Thus, the fast-learner program had no apparent effect on the feelings of fast-learners toward their classmates within the regular classroom setting. This finding seems to contradict the common view that

special grouping fosters attitudes of intolerance.

4. In regard to group cohesion, the three sociometric tests (with one exception) showed that no significant difference was found at any grade level for any of the three sociometrics. Thus the fast-learner program did not seem to have any apparent effect on the volume of mutual choices (positive interaction).

5. The fast-learner program did not result in the formation of identifiable sub-groups of cliques among the fast-learners with their regular classroom groups.

Goldworth concluded that for regular classroom groups the fast-learner program (a) had a limiting effect on the number of classmates which children accepted as best friends; (b) had no effect on fast-learners' acceptance of classmates as best friends, on group cohesion, or on sub-group preference; and (c) that despite the occurrence of some negative changes, these children's social relationships remained relatively stable. The value of this study was limited because of lack of coordination of teacher effort, the duration of the project was only five months, and the sociometric instruments furnished only limited information. These fast-learning children attended special classes held for 90-minute periods twice a week.

Mann (1957) posed the question, "How real are friendships of gifted and typical children in a program of partial segregation?" The procedures developed were designed to measure the social position the gifted children held among gifted as well as typical classmates. The procedures consisted of two sociometric measures and a parent questionnaire.

The first sociometric measure was given to children drawn from the

fourth, fifth, and sixth grades--in all, 281 children. Of this number, 67 were gifted children. These gifted children came from two workshops at Colfax--the intermediate and the senior workshop groups. The intermediate workshop group consisted of 31 gifted children drawn from the fourth and the lower half of the fifth grades. The senior workshop group consisted of 36 gifted children drawn from the upper fifth and sixth grades.

Here gifted children, as members of the intermediate workshop, chose other gifted children over typical children in 181 more instances. In the senior workshop, they chose other gifted children over typical children an additional 124 times. Typical children, too, when they chose friends, seemed to prefer friends from their own level. Typical children from the intermediate regular classes chose other typical children over gifted children in 524 more instances. In the senior regular classes, they chose other typical children over gifted children an additional 806 times. In all instances, gifted and typical children significantly chose and rejected more of their own group. The results of the second sociometric which was given to the 67 workshop children, tended to reinforce the findings on the first sociometric. A correlation of +.42 was found for intermediate workshop children and +.39 for senior workshop children.

It seems to the investigator that correlations of +.42 and +.39 for the workshop children showed that a slight relationship is present, but not a strong relationship. Also, the fact that the gifted children's contacts with typical children were far from real leaves the study without an adequate control situation.

In connection with this same study, a parent questionnaire indicated: (a) there was a substantial relationship between the friends of the workshop children in school and those they had in the community. The higher the school acceptance score, the more frequent the mention of the child's name on the parent questionnaires; (b) the workshop provided the most frequent locale for meeting the friends that gifted children made. One might say, therefore, that while the workshop--the room in which gifted children worked together--helped to develop and reinforce friendships in and out of school, the regular class, which provides a place where gifted and typical children mingle and which is really the unique contribution of the Colfax Plan, did not actually produce relationships significant enough to be classified as friendships. This again calls attention to the fallacy in believing that grouped children have arrived at accepting each other for what they are.

Williams (1959), in her study regarding "Acceptance and Performance Among Elementary School Children," sought to determine if acceptance significantly influences performance. She administered the California Test of Mental Maturity and a Classroom Social Distance Scale to 117 gifted pupils plus others to a total of 888 children. Numerical analysis of the data revealed that four out of five children high in total acceptance were achieving within or beyond expectancy. She summarizes as follows:

> 1. No appreciable differences in intelligence between high and low acceptees.
> 2. An appreciable difference in both test-measurements and scholastic evaluation of social performance favoring the high acceptees.
> 3. Evidence of greater acceptance extended to the group by the high acceptees.
> 4. No difference between high and low acceptees with regard to characteristics valued in friends.

> 5. Greater permissiveness and wider variety of channels for learning in the experience of the high acceptees.
> 6. More consistent satisfaction with the inter-personal relationships among the high acceptees, and more consistent dissatisfaction among the low acceptees.
> 7. Considerable difference between high and low acceptees in the fulfillment of their emotional needs, as indicated by the Van Pit Series-Wishes. (Williams, 1959, p. 43)

It was significant that none of the individual gifted children considered himself a "big brain." None sought special attention, and none were anxious for special teachers or more school work. All were willing to attempt the work outlined by the school.

She concluded that

> if schools make a greater effort to fulfill the needs of gifted children by strengthening acceptance, in all probability the performance of such children will thereby be improved. . . . Look to the child first, and only subsequently to his gifts. . . . The school must re-examine practices which are inimical to acceptance, and change them. (Williams, 1959, p. 43)

Armstrong (1955) compared the interests and social adjustment of underachievers and normal achievers at the secondary school level. The procedure followed was to administer the Otis Quick-Scoring Mental Ability Test, Gamma Form, to all students in grades 9 and 11 in Woodrow Wilson High School, Middletown, Connecticut to establish a common standard of intelligence. Otis I.Q. scores and the average of school marks were correlated; those whose average school mark was at least one-half of one standard error of prediction below their predicted average were considered underachievers. These were matched on age, sex, grade, and curriculum with a control group (normal achievers) whose average school marks were within one-half of one standard error of prediction from the predicted average. Kuder Preference Records, Vocational and Personal,

were administered to all students in the study. Scores above the 75th percentile (high scores) and below the 25th percentile (low scores) were compared for underachievers and normal achievers. Rating scales on "cooperation," "dependability," and "judgement" were completed on all students by selected teachers. Each student was interviewed by a counselor who followed a specific outline, and personal records were used to clarify data obtained in the interviews. Chi square was used as a test of significance for all comparisons between underachievers and normal achievers.

She concluded that underachievers were more likely than normal achievers--

> 1. To be following vocational goals set for them by others.
> 2. To have stated goals not in line with their dominant interests.
> 3. To prefer outdoor activity.
> 4. To have been chosen less often for positions of responsibility (girls only).
> 5. To prefer companions older than themselves (boys only). (Armstrong, 1955, p. 1349)

Opinions and arguments relating to environment

Family background and home conditions. Consideration of the principal areas where children spend most of their time, brings to focus the importance of the home and of the school in the development of the child. Few people, however, realize fully the deep influence of these two factors--and fewer still realize how disproportionate is the time spent in the home, or under the influence of the home, as compared with the time spent at school.

From birth through age 14, the average child spends less than 10 per cent of his time in school. Approximately 90 per cent of his time is spent in or around the home, or under the influence or control of the home. There are 8,760 hours of time in a year, or approximately 123,000 hours in 14 years. If a child spend 7 hours per day in school for a 9-month period (180 days) from age six to fourteen, he will spend approximately 12,000 hours in school in these nine years. When trips, illness, half-day sessions, and other attendance factors are brought into the picture, the amount of time spent in school (and especially in actual study time) from birth through age 14 will be found to be under 10 per cent.

The home becomes the first school of the child. In good homes, parents should know their children better than any teacher could know them, and should have more influence with them than any teacher could possibly have. Parents who take the time and the interest to satisfy the curiosity of their children, to provide creative play and purposeful learning experiences, will have done much to insure the healthy personality and sound character traits needed for well-rounded mental and emotional development and will have done much to avoid the deep-seated traits that are though to be related to underachievement.

Of recent years, changes in family life have been evident, and there may be some of these which are not for the better. Perhaps there are certain factors which could be related to underachievement. The movement of a greater proportion of the people to urban areas, reduction of family size, less opportunity for good times within the family circle, and a greater percentage of mothers working away from home are all

happenings which older people recognize as changes. The increasing mobility of families and the rapid development of housing areas may not provide stable adult models for the young. It may be that the gaps left by these changes in family life have not yet been filled by the schools or by other social agencies.

Occupational distribution of parents and index of social position. In an attempt to determine which significant personal and social characteristics distinguish high school girls who plan to go on into higher education from high school girls who plan to marry, get a job, or take technical training for a job immediately after graduation from high school, Stivers (1959) hypothesized that: (a) high school girls in the upper quarter of academic ability who want to go to college have a higher socio-economic status than those who do not plan to go to college; (b) that there would be a greater need for achievement on a level of excellence; and (c) that the desire to go to college is developed and directed by certain experiences in which relatives, teachers, friends, and others play an important part in defining college as a rewarding experience.

Of 45 girls from the top one-fourth of a class in a midwestern high school, 32 expected to enter college; 13 planned to do otherwise. Stivers first hypothesis was confirmed, although not strikingly; the second was refuted; the third was confirmed.

Teacher influence. In Rosenfeld and Zander's (1961) study of teachers' influence on student aspirations, a questionnaire was used. The purpose was to explore the effect of teachers' influence upon students' aspirations for achievement in school.

Hypotheses drawn from earlier work on the differential consequences of separate types of social power were tested in a correlational analysis.

1. Tendencies to accept a teacher's influence are aroused in students who are subject to reward, legitimate, referent, or expert power; while tendencies to ignore or oppose what teachers desire are aroused in students subject to indiscriminate coercive influences. . . . . .

6. The separate bases of power are effective in determining aspirations to the degree that the students are ego-involved in the performances on which they are setting aspirations. (Rosenfeld and Zander, 1961, pp. 10-11)

Goodlad (1960), in his article, "Pressures to Learn Can Be Blocks to Learning," stated:

1. Prepackaged content and inappropriate rewards. . . . A shift has occurred, a subtle but significant shift. A process of inquiry, a process of putting ideas together to infer a logical conclusion, has shifted to a mere guessing game. Guess the right answer and the teacher's warm beam of approval floods down upon you. . . . . Perhaps, for some aspects of learning, machines are more promise than threat. At least they focus on learning for learning's sake. You press the button and you're right or you're wrong. No syrupy words of commendation, no halos, for guessing the teacher's mind.

2. Perceptions of coverage. . . . A crippling perception of coverage often is part of the teacher-learning environment. . . . Such a concept of coverage creates immeasurable pressures to learn. It, too, is based on a "sacred cow" view of the curriculum. . . .

3. External standards. . . . Short-route methods take on a special attractiveness. Drill replaces the search for meaning. . . . Teacher presentation replaces pupil exploration. Routes that <u>appear</u> to be most direct take precedence. . . . True standards free rather than restrict the human mind in its search for order and truth . . . .

4. Some grounds to stand on . . . . <u>First, we need a concept of curriculum that better defines</u> (gives limits) <u>our freedoms</u>. . . . Some facts are transitory. . . . Such facts should be subordinated to the larger ends of formulating and employing concepts. The teacher is free to use whatever data seem appropriate to the clarification of larger concepts. . . . <u>Second, we need a better understanding of the learner realities</u> (individual differences) <u>before us</u>. . . . Actually, the differences in reasoning among slow and bright children almost defy mathematical comparison. One is thousands of times more proficient than the other in certain kinds of abstract reasoning. . . . <u>Third, we need a concept of learning embracing unlimited expectancy for human creativity</u>. . . . We know only that our school practices tend to recognize and reward certain abilities out of proportion to other abilities. . . . What we value in peacetime we value not in time of war. . . . Schools must avoid

> like the plague external rewards for certain kinds of learning that freeze the creative process in its infancy. They do well to encourage creativity as an end in itself. . . . Somewhere along the educative and miseducative road that is life, the learner must respond to compelling forces within him, forces seeking to repeat the satisfactory experience of coming to know for one's self. The best way to make sure that these forces never will hold sway is to substitute for them pressures from without--pressures to please, pressures to cover, and pressures to conform. (Goodlad, 1960, pp. 24-27)

Fliegler (1957), in his study on understanding the underachieving gifted child, stated:

> Unknowingly, the teacher may further increase oppositional tendencies and feelings of inadequacy. The teacher, recognizing the underachiever's ability, urges him to achieve beyond his functioning level. Unable to respond to blandishments, he secures lower grades since it is appropriate mental hygiene practice to evaluate the child's present achievements against his potential. The effect only serves to intensify feelings of failure. An analogy, at this point, may highlight the incongruity of the situation. The slow learner who operates below his expectance is considered working within the scope of his deficiency. Generally, teachers assume that this is not unusual for a slow learner. However, it is believed that the converse holds true for the gifted. He can always overcome his inadequacies and is merely being lazy. Obviously, this reasoning is based upon teacher projection rather than an analysis of behavioral data. (Fliegler, 1957, p. 535)

Frandsen (1957), in his book How Children Learn, lists seven essential conditions for elementary school children to learn effectively to read, to understand arithmetic or social studies, to acquire appropriate social techniques, or to learn effectively in any of the areas previously outlined, and at the same time acquiring confidence as learners and interests in many learning activities:

1. Sufficient mental maturity and an appropriate pattern of abilities;
2. Teacher-guidance in focusing attention on
   a. Goal-directing hypotheses (mental sets leading to identification, discrimination, and differentiation of stimulus clues, and to tentative formulation of means-to-goal response patterns),
   b. Efficient modes of attack and
   c. Adjustments in goals or standards to the progress of the learner;

3. Practice which consists of provisional trials or hypothesis-guided self-activity oriented toward discovery, differentiation, and integration of more effective patterns of behavior;

4. Perception of the effects of each trial, with provision for checking the correctness and adequacy of each and for revising subsequent efforts in the light of clear perception of the results of previous goal-directed attempts;

5. Provision for transfer of training, which involves emphasis upon meanings, the inductive learning of principles, the interorganization and expansion of these principles, and their useful application;

6. Motivation, which arouses, sustains, directs, and determines the intensity of learning effort, and which in cooperation with perception of the effects defines and evaluates the consequences of provisional trials; and

7. Freedom from anxiety and distorting attitudes which impair or prevent effective learning. (Frandsen, 1957, pp. 46, 47)

Evidence relating to personal characteristics

A study by Goldberg (1959) analyzed the causes of underachievement. In the spring of 1956, the administration and supervisory staff of DeWitt Clinton High School invited members of the Talented Youth Project of the Horace Mann-Lincoln Institute of School Experimentation, Teachers College, Columbia University, to cooperate with the school in studying (a) social and personal factors associated with underachievement, and (b) to experiment with school procedures which would provide special attention to the problems of an underachieving group.

Of 102 entering-tenth-grade underachievers, 70 students were paired on the basis of I.Q. and ninth-year averages. One student from each pair was placed in the special class and the other became a control. The control students were unidentified to themselves or to their teachers and were randomly distributed in homeroom situations and subject matter classes.

In addition, a group of high ability high achievers was identified.

Records were kept on these students, but no special provisions were made for them beyond those normally made by the school for able students.

A testing and interview program was designed to bring out the differences between these groups. Dr. Jane Beasley of the Talented Youth Project interviewed 26 of the underachievers (15 from the special class, 11 from the control group) and 4 of the high achievers. Too, the Iowa Tests of Educational Development were administered as a regular part of the school's testing program. Also, objective measures of self-attitudes, attitudes toward school, family patterns, problem areas, academic aspiration levels, and vocational choices were obtained from each student in the study. Parents filled out questionnaires, also.

The Iowa test supported the conclusion that achievement on objective measures of academic mastery is more closely related to intelligence than to school grades.

The attitude and personality measures provided insight into the lives and attitudes of bright young adolescents:

1. Disruption of the normal family pattern was much more frequently observed among the underachievers.

2. The highs were more satisfied with school and with their school performance than were the underachievers.

3. When asked what grade they would be willing to settle for in examinations, the highs would rarely settle for anything below 90. The underachievers stated that they would be fairly satisfied for a passing grade of 75.

The interviews produced information in regard to friendships that was revealing. All the students took part in social activities and had

friends. Frequently, however, they attributed their social success to "not being a grind," to not studying too hard nor too much. They recognized the fact that they were potentially capable of outstanding academic achievement, but in most of the interviews there was strong resistance against making the necessary effort.

Winkler and MacNutt (1960) studied problems involved in underachievement at the fourth-grade level for the purpose of understanding, if possible, reasons why children seem to fail to continue the growth of which they seemed so capable during the first three years in school. Information was sought concerning underachievement as it relates to intellect, personality, socio-economic conditions, family relationships, health and developmental patterns, and peer and authority relationships.

The subjects were 271 pupils (148 boys and 123 girls) in the fourth grades from eight schools in Tangipahoa Parish, Louisiana.

The approach was a teacher-administered California Achievement Battery to locate underachievers--those whose grade placement on two or more areas was below 4.0 and whose level of intelligence was above 90 I.Q. Intelligence was evaluated by administration of SRA's Primary Mental Abilities; personality, by SRA's Junior Inventory; social acceptance, by the Ohio Social Acceptance Scale. Other areas involving the family were obtained by a questionnaire filled out by the parents.

Among the findings were the facts that

> girl underachievers have more personality problems than boy underachievers, apparently because it is a threat to a girl's self-concept. Underachievers were concentrated at the middle socio-economic level, with a small percentage in the lower level and none at the upper middle class. Social class level, parental pressures, and level of aspiration are the significant factors in the child's underachievement. (Winkler and MacNutt, 1960, p. 58)

Self-concept. Closely related to aspiration level is the self-concept factor in the personality development and achievement of children.

The results of part of a research project being performed pursuant to a contract with the United States Office of Education by Brookover, Velinsky, and Thomas (1961), of Michigan State University, have been made available to the investigator. The research in which they are currently engaged pertains to the question: Is it true that achievement is primarily related to the individual's self-conception of his ability, and this irrespective of his measured I.Q.?

For their sample, they took all seventh graders for whom two sets of I.Q. scores were available. On the basis of the two sets of I.Q. scores and school subject grades for the fourth through the sixth grades, a sample of 1,151 students was obtained. From this number, they determined the over-achievers and underachievers and eliminated the 365 students who fell in the middle range.

The results of their study overwhelmingly confirmed the theory. The higher the achievement scores, the higher the self-concept of ability. It was noted that the high achievers had a higher mean self-concept score than the underachievers even though these two groups had comparable I.Q.'s. The level of significance was .001.

Two other theories being tested in this project, on which results are not yet available, are: (a) Does the student have just a generalized conception of his ability to learn, or does he have a series of self-concepts related to different content areas? (b) How is this self-concept developed? Although the results on the larger study for the second hypothesis are not yet available, if they follow the pattern of

the pre-test interviews, it will be shown that

> the differentiation of self-concept along subject matter lines is quite real for the student. There also seems to be a tendency for a student's general self-concept of his ability to correlate more highly with his best grades, rather than with his worst. If this holds for our larger group, we would be led to conclude that one's general "self-concept of ability" is weighted more heavily by successes than by failures. (Brookover, Velinsky, and Thomas, 1961, p. 7)

A study by Bills (1953) attempted to determine the relationship between the level of aspiration scores on the Index of Adjustment and Values with five behavioral scores designed to measure level of aspiration.

The five-level aspiration tasks were: (1) dart throwing, (2) Rotter target aspiration board, (3) marking out letter, (4) substituting letters, and (5) addition.

In the marking out test, the subject was given a paragraph and instructed to mark out as many e's as possible in two minutes. The substitution test consisted of a series of letters with a blank space beneath each. At the top of the page was a key; the subjects were instructed to place below each letter the correct letter acquiring to the key. Two minutes were allowed. The arithmetic test was a series of five two-place numbers. The digets were arranged in different order in each series, but problems on all series contained the same combination; the time limit again was two minutes.

In each test, the subject was given a series of practice trials and informed of his score on the last practice. Next he was given the test and told his score on this. He was then asked, "How much do you think you could make the next time?" The next test was conducted, his performance recorded, and the subject was asked, "How much do you

think you scored?" The subject was then informed of his score. "How do you feel about the performance?" His remarks were recorded. Then after an interval in which the subject read some other material, he was asked to recall his score on each of the five-point scales.

The Index of Adjustment and Values requires a subject to make three ratings on a five-point scale for each of 49 traits. The ratings are arranged into three measures: concept of self, acceptance of self, and concept of ideal-self. The discrepancy between concept of self and concept of ideal-self is the measure of level of aspiration set by the subject in respect to his ideals.

The study arrived at the conclusion that acceptance of self, as shown by the Index of Adjustment and Values, was significantly related to attitude towards performance, estimate of performance, and recall of performance.

Goldberg (1959) found that improvers differed significantly from non-improvers.

> On the self-attitudes inventory, the non-improvers showed a greater discrepancy between their perception of their abilities and their wished-for ability status. This score is generally viewed as an index of adjustment and suggests that the non-improvers see their ability to perform in va rious areas as too far from where they would like it to be to warrant making an effort to improve. (Goldberg, 1959, p. 23)

The problems discussed under aspiration and self-concept indicate the delicate nature of providing individual motivation which is neither too great nor too mild. It appears that to help the underachiever the teacher needs to deal in more than generalities. An individual approach is needed.

Emotional disturbance. What part does emotional disturbance play in causing underachievement? Is it possible that conflicts, anxiety, emotional disturbance, and other manifestations of poor adjustment are caused by poor academic ability and in turn contribute to poor scholarship? In other words, is there a circularity in the relationship of these factors?

Jensen (1958) experimented with four groups of college students. All students took the MMPI. The grade point averages of each group is shown below:

		Scholastic ability	Predicted	Actual
Group A	146 non-achieving students	low	2.27	1.75
Group B	107 achieving students	low	2.27	2.25
Group C	147 achieving students	high	2.93	2.25
Group D	58 non-achieving students	high	2.93	1.75

The most obvious trend in this study was for the non-achieving students of low ability to consistently obtain higher scores on the MMPI than achieving students of high ability.

> These findings offer some support for the general hypothesis that students of low scholastic ability as compared to other groups are at a disadvantage with respect to non-intellectual areas of college life. With certain exceptions, there was a general tendency throughout the study for non-achievers of low scholastic ability to encounter more adjustment problems than other students with whom they were compared. Thus, these students tended to be at a disadvantage with respect to non-intellectual areas, as measured by the MMPI, as well as in their academic pursuits. The general trend was for gifted achievers to express themselves as having fewer adjustment problems than the other groups. The results presented throughout this study support the findings reported by Terman, Brown, Hinkelman, Lightfoot, and others. These studies, including this one, all have a tendency to show that scholastic ability favors adjustment, while low scholastic ability obstructs it. (Jensen, 1958, p. 500)

Jahoda (1955) described the mentally healthy person as having: a workable adjustment to social conditions and the environment, including the freedom to modify conditions when necessary; a consistent inner regulation of behavior relatively free from inner conflicts; and a correctness of perception of self and others.

Ullmann (1952) studied 810 pupils to determine each one's mental adjustment. Six kinds of information were obtained by use of (a) ratings by teachers on the adjustment level of the child; (b) ratings by teachers using forced choice test of adjustment; (c) the self score on the California Test of Personality; (d) the social score on the California Test of Personality; (e) the basic difficulties score on the Science Research Associates Youth Inventory; and (f) a sociometric rank converted to a standard score. He found 8 per cent of the students to have severe maladjustment, and that the best identification was obtained when teacher ratings, self-descriptive data, and peer ratings were combined.

A project on a process for early identification of emotionally disturbed children was reported by Bower, Tashnovian, and Larson (1958). This project was undertaken by the California State Department of Education and involved 75 school districts, 200 teachers, and approximately 5,500 school children. There was at least one clinically designated emotionally disturbed child in each class of the 200 teachers. Altogether there were 162 boys (approximately 3 per cent) and 45 girls (approximately 1 per cent) in the group of emotionally disturbed children. According to the above data, the number of boys and girls combined who were emotionally disturbed was 3.8 per cent (Bower, Tashnovian, and Larson, 1958, p. 18).

Findings:

1. The emotionally disturbed children scored significantly lower on group I.Q. tests. On psychological tests given individually, they approached the mean of all children included in the study.

2. The emotionally disturbed children scored significantly lower on reading and arithmetic achievement tests. The differences were greater and more significant on arithmetic achievement. The higher the school grade, the greater the differences between the emotionally disturbed child and others in the classes.

3. The emotionally disturbed children differed significantly from the other children in the classes in their self-perception as revealed in some of the items in the Personality Inventory. Emotionally disturbed boys exhibited greater dissatisfaction with self and their school behavior than the other boys. Emotionally disturbed girls showed less dissatisfaction with self than the rest of the girls in the classes.

4. On the sociogram, "A Class Play," the other children in the classes tended to select emotionally disturbed children for hostile, inadequate, or negative roles and failed to select them for the positive, good roles. Hostile children particularly were selected for roles consistent with their behavior.

5. The emotionally disturbed children came from homes which were not significantly different in socio-economic level from those of other children generally.

6. Altogether 87 per cent of the clinically known emotionally disturbed children were rated by their classroom teachers as among the most poorly adjusted children in the class. . . . Nearly 61 per cent of these were described by the teachers as being overly aggressive or defiant often or most of the time . . . . , while 25 per cent were designated as being overly withdrawn or timid quite often or most of the time. . . . As perceived by teachers, 4.4 per cent of all the children in the classes were overly aggressive or defiant most of the time . . . , while 6.1 per cent were overly withdrawn or timid most of the time.

Implications:

1. Children's judgments of other children's personality are surprisingly accurate and predictive.

2. Teachers' judgments of emotional disturbance are very much like the judgments of clinicians.

3. Teachers selected a greater number of children as being overly withdrawn or timid most of the time than as overly aggressive or defiant most of the time.

4. At least three children in each average classroom can be regarded as having emotional problems of sufficient strength to warrant the appelation "emotionally disturbed children."

5. The differences between emotionally disturbed children and the others seem to increase with each grade level. (Bower, Tashnovian, and Larson, 1958, pp. 67, 68)

Mathias (1959) used Rorshach and TAT to measure aggression and depression. He compared aggressive and depressive responses of high intelligence, average intelligence, and low intelligence quotients. He found the average group had the fewest number of aggressive responses. Bright and slow students both had significantly more aggressive responses than average students (beyond the 1 per cent level). These findings were obtained with both the Rorshach and TAT tests. He concluded that the greater amount of aggression found in the bright and slow pupils is due to frustration in the school situation which is aimed primarily at the average pupil.

The high I.Q. group established the least amount of depression. The lowest I.Q. group established the greatest amount of depression.

Stone and Ganung (1956) reported a study which they began in 1947. One hundred and twenty-six freshman students were studied during a four-year period to determine if differences in scholastic achievement could be found between those who had high scores on the Minnesota Multiphasic Personality Inventory and those who obtained normal scores.

They concluded that--

1. Over the four years of college experience, those girls who scored high (70 or above) on one or more scales of the MMPI received a lower grade placement average than those receiving normal scores. "Although the difference was statistically significant, it could be described verbally only as 'medium C' as compared with 'high C.'" (Stone and Ganung, 1956, pp. 155-6)

2. Significantly more of the normal group graduated as compared to the high scoring group on the MMPI (38 per cent as opposed

to 22 per cent).

3. There was no significant difference in the number of quarters completed by the two groups.

The foregoing studies clearly indicate that emotional disturbance is detrimental to academic achievement.

Health. Klausmeier (1958) studied the physical, behavioral, and other characteristics of high- and lower-achieving children in favored environments.

> The means of height, weight, strength of grip, permanent teeth, and carpal development of high achieving children were found to be not significantly different from the means for low achievers in third, fourth, and fifth grade classes in favored environments. (Klausmeier, 1958, p. 580)

Intelligence quotient. How and to what degree is intelligence related to the achievement of students? Hinkelman (1955) conducted a study to seek an answer to this question. Thirty boys and 30 girls were used. Their grades over an eight-year period--second through seventh grade--were correlated with I.Q. scores obtained by the use of the Kuhlmann-Anderson Intelligence Rating test.

> The present correlations have resulted from an attempt to find how verbal intelligence correlates with teacher grades at the elementary school level. The data of this study indicate pupil progress in nine of the ten curricular areas studied are markedly related to intellectual ability for the three selected grades. . . . The correlations, in summary, show verbal abstract intelligence has an important and consonant relationship to elementary school achievement. Further investigation along the present line, together with other relative factors to school success, would add much to the inadequate number of research studies made on the elementary school level. (Hinkelman, 1955, pp. 178-9)

A study by Frandsen and Higginson (1951) of 50 fourth-grade school children, using Stanford-Binet I.Q.'s and total grade equivalent

scores on the Stanford Achievement Test, showed a tendency for high I.Q.'s to correspond to higher achievement. The correlation was .63. If this is interpreted by the use of the coefficient of determination (r^2), it indicates that approximately 40 per cent of the variation in achievement of these students can be accounted for by variations in their I.Q. Study and work methods, motivation and other factors may account for the other 60 per cent.

Interests, goals, and achievement motives. According to Burdick (1961), who obtained chi square values on six TAT pictures for two independent groups with N's of 215 and 201, respectively, found need for achievement, affiliation, and power are independent and may be combined statistically.

> Need for achievement refers to a drive to compete satisfactorily with an interiorized standard of excellence; need for affiliation has reference to a drive to establish, maintain, or restore a warm, reciprocal relationship with another person; and need for power refers to a drive to control the means of influencing another's behavior. (Burdick, 1961, p. 225)

All three--achievement, affiliation, and power--are measures of motivation.

Achievement motivation in normal and mentally retarded high school children has been studied by Jordan and deCharms (1959). The purpose of the study was to "evaluate the conceptual and empirical status of the achievement motive in the study of mental retardation, using two groups of mentally retarded, educable adolescent males and a comparable group of normals."

> The empirical findings of the study suggest that the n achievement measure is, at the moment, not applicable to the prediction of academic performance either in a first-order correlational relationship, or in a multiple correlational relationship with

an intelligence measure.

> There is evidence to support the contention that n achievement scores, and therefore levels of achievement motivation, are not a function of the level of intelligence. Some children of low intelligence show high achievement motivation, and vice versa. (Jordan and deCharms, 1959, pp. 4, 16-17)

Armstrong (1955), reported in the evidence section of this study under the heading of Causation and Identification of Underachievement as related to enrironment, studied the interests and social adjustment of underachievers as they compared to a matched group of normal achievers on the secondary school level. Statistically significant differences between underachievers and normal achievers were found as follows:

> Underachievers were found more often (1) to have chosen their future occupations because of the influence of others, (2) to have future vocational goals which did not agree with their dominant interests as measured by the Kuder Preference Record-Vocation, (3) to have obtained a greater number of low scores on the computational sclae of the Kuder Preference-Vocational, (4) to have obtained more low scores in the area of "preference for avoiding conflicts" as measured by the Kuder Preference Record-Personal (5) to have obtained lower ratings on "cooperation," "dependability," and "judgement," (6) to prefer companions older than themselves (boys only), (7) to have obtained a smaller number of high scores on the computational scale of the Kuder Preference Record-Vocational, and (8) not to have been chosen for positions of responsibility in extra-curricular activities (girls only). (Armstrong, 1955, p. 1349)

Opinions and arguments concerning personal characteristics

As stated in the previous section, many environmental factors influence achievement. Personal factors within the student are also extremely complex. The first step in working with those students who are underachieving would be their identification. This must be carefully done, as pointed out by MacLean (1958). He felt that underachievement might be related to the complexities of the adolescent

life: school, sports, dances, Scout troops, clubs, movies, TV, radio, bands, etc. He felt that adolescents are often overscheduled and overloaded.

> To make a judgment as to whether a boy or girl is underachieving, I think it essential to examine, over a considerable period of time, all of the activities in which time and energy are invested in terms of interests and values, of external and internal pressures. If we find that pupils are in fact overscheduled, we run into the paradox that the sure way to get them to achieve in academic work is to give them far fewer things to do. How this can be accomplished I do not know. Can we reduce the demands upon them of their homes, their churches, their social organizations, and the varied and powerful lures of the entertainment industry in order that they may have more time and energy for study? I think not, for these are the established patterns of American life.
>
> . . . . . .
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> Assuming a psychophysical energy level to match high measured academic intelligence, we still find it essential to inquire into a pupil's interests before we can name him an underachiever. Although the Bestors, Rickovers, Hutchins, and other critics of our high schools would ignore or deny either the validity or importance of interests as a key to achievement, we cannot do so. The extensive, careful research over a 40-year period by E. K. Strong, M. E. Hahn, J. G. Darley, Frederick Kuder and their associates and students has established beyond cavil that interests (1) are becoming patterned and canalized in the high school years and change very little during the rest of life; (2) have a low correlation with abilities (i.e., may have a profound and lifelong interest in music and in foreign language, but little ability in either because my ears are insensitive to fine shades of tone or pronunciation); (3) when both interest and ability are high, achievement is almost certain; (4) which are lacking or low in intensity can rarely, if ever, be developed by forcing, demanding, or punishing. It is clear that an essential element in the identification of the underachiever is the measurement of his interests. (MacLean, 1958, p. 70)

Identification of underachievers. Sufficient means of identification will be found in most schools. Although many variations exist, the general rule for identifying an underachiever is a comparison of his actual achievement with his potential achievement, as measured by some well-established test of mental ability. The subjective judgment of school personnel is also used when research is not involved.

A few examples are cited to illustrate common methods of identification. Calhoun (1956) used a disparity in months greater than 13.48 between mental age and achievement age as a measure of underachievement. Armstrong (1955) correlated Otis I.Q. scores and the average of school marks. Those whose average school mark was at least one-half of one standard error of prediction below their predicted average were considered underachievers.

Super (1949) showed a correlation between I.Q. and achievement of from .40 to .50. Having established this relationship, a predicted grade average was computed by using the regression equation $b = r \frac{\sigma x}{\sigma y} y$. The predicted average was compared with the average actually received by the student. Whenever the obtained average was one-half of one standard error of prediction below the predicted grade average, that student was considered an underachiever.

The present study used the disparity between expected education age and education age, as explained in the Procedure section, page 105.

Study methods. No studies were found showing a relationship between study methods and underachievement. The desire to investigate this area led to its inclusion in the present study.

Aspiration. Is a child's aspiration level related to his achievement? This is a question which may be and is asked concerning underachievers. In studies of this type, tasks of equal difficulty and subject to equal objectivity in scoring are often given to students in a series. These tasks must not be so difficult but that increased effort may result in an improvement. The individual may be asked to

guess or estimate what his next score will be, based on his previous experience with the series.

Sears (1940), in studying fourth-, fifth-, and sixth-grade children, found that successful students set realistic aspiration levels. Because their goals continued to be reached, the sequence is "gratifying and becomes self-perpetuating." Frustrated or unsuccessful children have aspiration levels which are much less realistic. They tend to set them either too high or too low. They may thus achieve satisfaction from imagined success or derive satisfaction from over-reaching a goal which was set too low (Sears, 1940, p. 530).

A student's trials, then, if successful, would be reinforced and used on other occasions. Success appears to lead to heightened interest and effort and its effect is fairly certain. Reaction to failure appears to vary greatly with different individuals.

Studies involving short and long-range aspirations will undoubtedly prove valuable in the study of underachievement. A current study which will be closely watched is that of Schultz (1961). Schultz is investigating the aspirations of high school students. The form which was used to obtain measures of aspiration from students included five major areas: family information, educational plans, vocational interests, work experience, honors, awards, and special interests.

Russell (1958) in commenting on the possible causes of underachievement, brought out the thought that children do not deliberately choose to be underachievers.

> Due to certain experiences in his life, a child may find himself not measuring up to his capabilities, but few are the children who construct all the plans for such a situation. Practically no normal child is inherently antagonistic to life situations and

> people, nor is he born to be lazy or indifferent to new experiences. (Russell, 1958, p. 68)

He suggested, further, that negative feelings may have been engendered in school life, home life, or community life.

Health. Teachers attack the underachievement problem from all sides, but in attempting to motivate underachieving students to work up to the limits of their capacity may overlook factors such as health, or other factors which are not always outwardly manifested.

However, there are means available to teachers and parents of identifying poor eyesight, hearing, low blood count, and other serious difficulties which may keep students from not doing their best. Parents, the school nurse, and the physician should team up in these cases to give whatever assistance is possible.

MacLean (1958) says:

> A frequent reaction of school personnel to finding an underachiever is to counsel, cajole, goad, or threaten him in the hope of making him work and study up to the limits of his capacity . . . . Discrepancy between measured academic intelligence and performance in terms of grades is only one clue, the simplest and easiest of all. Beyond and beneath such surface symptoms lie many factors. First and most basic is the pupil's physical and psychic energy level. (MacLean, 1958, p. 69)

He suggested that a teenager's energy may be sapped by the speed of his growth, poor diet or malnutrition, loss of sleep, puberty and related distractions, or colds and diseases.

Home conditions. There is support in the literature for the view that home conditions play an important part in the achievement of the child. Gowan (1955) supports this view, as does Fliegler (1957). Fliegler points out the psychological basis underlying the relationship

between the home and the underachieving child:

> Primarily, the underachiever dislikes people--parental figures, authority figures, siblings, and peers. Unable to create warm relationships, he perceives the world negativistically and this fosters emotional disturbance and insecurity. The inability to identify positively with people magnifies negative values which are consequently transferred to the learning situation.
>
> Resistance to acquiring new information by the underachiever is directed toward the teacher. Realistically, the underachiever possesses the ability to cope with intellectual problems; hence, the marginal achievement may be conceived as a result of viewing the teacher as an antagonistic symbolic figure. It is unavoidable that preconceived hostile notions be expressed toward the teacher either passively or overtly since the underachiever reflects barren familial relationships. This deductive inference is open to question and limited, but it is necessary to postulate probable conjectural statements for further research and observation.
>
> Two additional aspects of personality dynamics are of interest . . . . In order to maintain a degree of emotional homeostasis, the underachiever lowers his level of aspiration which reduces any desire for academic achievement. Such behavior is necessary in order to maintain an integrative personality. The lowered level of aspiration is hypothesized to reflect general diminution of creativity. The underachiever doesn't select certain areas to dislike and others to enjoy; he withdraws from intellectual challenge because it is uncomfortable.
>
> Furthermore, it seems that the underachiever has a low threshold of frustration. Coupled with a lower level of aspiration, frustration tends to restrict the youngster's inclination to achieve. . . . Hence, it is not too presumptuous to postulate that the underachiever is a maladjusted youngster. (Fliegler, 1957, p. 534)

Intelligence. Engle (1957) stated:

> In the elementary school, it has been found that achievement in classwork and intelligence-test scores correlated about +.75 . . . . Prediction of school achievement from intelligence-test scores is less certain at the high school level than at the elementary school level. Correlations from +.60 to +.65 are usually found between high school achievement and intelligence-test scores . . . . Nearly all students at the high school level are of average or higher intellectual ability. Thus it is harder to distinguish between them and harder to predict that one will do better than another. A second reason for the lower correlation at the high school level is that more factors are involved in high school achievement than in elementary achievement. In elementary schools, all students must learn basic facts and skills. The subjects studied are much the same for everyone. High school students have some opportunity to choose the subjects they wish to study. Consequently, interest plays a greater part in determining achievement than it

> does at the elementary level. . . . At the college level, correlations between achievement in classwork and intelligence-test scores are usually found to be about +.50. The college group is even more homogeneous in intellectual ability than is the high school group. (Engle, 1957, pp. 217-19)

Achievement differences and results

In this section an attempt was made to separate the studies which showed differences in achievement by subject matter from those showing differences in achievement by ability level. So much interrelationship existed that this was virtually impossible. However, by some repetition a measure of delineation was attempted. Studies showing over-all results in achievement under grouping will also be presented.

Subject matter differences

Barthelmess and Boyer (1932-1933), in their article on an evaluation of ability grouping, stated that there is a distinct favor for homogeneous grouping in arithmetic, reading, and technical English skills. They suggested, however, that the superiority may be due to greater professional stimulation of the experimental schools, but state that this is not probable. Their study presented exceedingly strong evidence that homogeneous grouping can be a factor in securing improvement in certain important skill subjects.

They studied academic achievement gains in five schools under ability grouping versus 16 control schools using random grouping in grades 4B and 5A. Classification of students into groups was based on comprehensive individual examinations by clinical psychologists.

Groups were matched according to grade placement, intellectual brightness, chronologicial age, initial status in the factors to be improved, and efficiency of teaching. They attempted to equate all conditions except the ability grouping variable.

The following results were noted:

The total of 565 experimental pupils made an improvement of 12.8 points, while the control group made 10.4 points. Thus there was an advantage of 2.4 months for the experimental group, with a standard error of .31 indicating statistical significance for the difference. The separate groups were both in agreement. For the entire 565 pairs, there was an advantage in improvement of 2.1 for high-ability students, a superiority of 2.6 for the medium-ability students, and a superiority of 1.8 for the low-ability students.

Nash (1942) conducted a project to determine if ability grouping would aid students in business training. Each year two small classes, representative of the highest and the lowest level of student ability, were formed. In 1938, 15 non-academic sophomores with low reading quotients were formed into a special remedial class. It contained a modified curriculum, built around a core of 10 English periods, and simplified academic units to offset the limitations of the reading handicap which the group had. Most of the work was oral, but all areas were taught. Typing was taught starting in the sophomore year. This group was held intact for three years. It was found that of the 15 original members, 11 fulfilled all diploma requirements and graduated.

Cook (1924), in his study of homogeneous grouping of abilities in high school classes, classified pupils according to previous grades

in English III, geometry, or nearest related subject. In English I and ancient history, students were classified according to the Terman Group Test of Mental Ability that was administered one week after the opening of the term. In order to compare accomplishments and results of the different methods used, special tests were devised and given at intervals during the term, and a comparison was made of the final term grades in these subjects. The tests were devised by both teachers involved.

Of the 600 persons in the classes in Cook's study, 495 scores were used to establish conclusions. Test scores from the three groups were assembled in separate tables. Scores were totaled and averaged in each group and the distribution of term grades tabulated. In English III and geometry where grades were compared, a tabulation was made of members of grades improved, stayed the same, or went down. A comparison showed pupils of superior ability did not benefit by separate grouping in geometry, for their grades were nearly the same as in the mixed group. Pupils of inferior ability did improve by their separation from bright pupils. In English III, the results indicated pupils of superior ability were able to do the work of this course equally well in both mixed or uniform ability classes. Inferior pupils improved, although not as much as they did in geometry. Nearly the same results were found in English I as were found in English III. In ancient history the top ability group showed a decided advantage over mixed groups. The records showed that pupils of low ability in ancient history did much better work in mixed groups where they were brought in with better minds than did the low ability group that was segregated.

Lorge and Mayans (1954), previously reported, in a study of mastery of English by Puerto Rican pupils, found that challenging them to understand in a regular classroom had marked advantages over separating them into vestibule classes.

Ability level differences

Below-average students. Cook's study (1924), reported in this writing under the previous section treating subject matter differences, reported that pupils of inferior ability did improve by their separation from bright pupils in geometry. They also improved in English III, but not as much as they did in geometry.

McElwee (1933), reported in this writing under Types of grouping, found that retarded pupils in arithmetic exceeded their reading achievement from two to six times.

Jordan (1959) attempted to evaluate the conceptual and empirical status of the achievement motive in the study of mental retardation, using two groups of mentally retarded, educable adolescent males and a comparable group of normals. He found that school achievement between retarded children in special classes and those in regular classes showed a difference in favor of those in regular classes.

Above-average students. Theisen (1922), previously reported, claimed that sections in the study that made higher intelligence test scores in each school excelled in scholarship. Intelligence and achievement were correlated and found positive. The highest correlation was between intelligence and arithmetic; reading comprehension ranked next; language, third.

Martinson (1960), previously reported, related that under a system of grouping for gifted pupils, ten out of twelve of the experimental groups were found to have made significant gains in mean scores in academic performance.

Goldberg (1959), previously reported, stated that the Iowa tests supported the conclusion that achievement on objective measures of academic mastery is more closely related to intelligence than to school grades.

Brookover, Velinsky, and Thomas (1961), also previously reported, stated that high achievers had a higher mean self-concept. From this it might be inferred that a relationship exists between high ability, high self-concept, and higher achievement scores.

Another previously reported study by Frandsen and Higginson (1951) showed a tendency for high I.Q.'s to correspond to higher achievement. The correlation was .63.

Opinion articles. No opinion articles came to the attention of the investigator relating to differences in achievement by ability level. It would appear that this area is too highly structured for observers to express opinions that are not substantiated by evidence.

Over-all results

The inter-relationship of scholastic achievement to ability grouping is generally recognized. In fact, the ideal of maximum achievement for each individual is an outgrowth of the recognition of the wide range of individual differences among students in the public schools. Educators find this one of their chief concerns, and many attempts

have been made by teachers and administrators to adjust curricula, schedules, goals, classes, and subject matter presentations to meet this need.

However, there are inherent difficulties in achieving homogeneity. Cook (1958) stated:

> General ability grouping was criticized and defended on education grounds, philosophical grounds, social grounds, and psychological grounds--all questions were raised except: How homogeneous are the groups in the particular subject being taught? (Cook, 1958, p. 249)

Vredevoe (1955) stated that there was no research which indicated that homogeneous grouping benefits all children in all subjects. His findings included the following:

> 1. General practice in secondary schools reveals attempts at both homogeneous and heterogeneous methods of grouping in every school.
> 2. The many variables involved make it almost impossible to have a truly homogeneous group.
> 3. Factors used for homogeneous groupings vary and change among individuals within the group.
> 4. Certain classes automatically provided more homogeneity than others: such as trigonometry, foreign language, chemistry, and stenography.
> 5. Recognition of the heterogeniety of a class should result in provisions of grouping within the group--the task should be within the grasp of every pupil in the class, but he should be required to stand on tip toe to reach it.
> 6. Experimental research is needed before any definite conclusions should be drawn relative to the value of either one method or the other in any secondary school class, activity, or experience. (Vredevoe, 1955, p. 37)

Ramey (1956) reported that there was almost complete overlapping from one ability group to another, but that teachers tended to generalize and teach according to their perceptions of the homogeneity of the group and neglected the wide inherent ranges in any group.

Polkinghorne (1950), previously reported, sent out questionnaires from the laboratory school at the University of Chicago to 43 schools

to obtain views on combined classes. Eighteen schools out of the 43 claimed achievement gains under this system of dual grouping.

Kraraceus and Wiles (1938), previously reported, with respect to academic achievement concluded that the objective data indicated that more than the average pupil growth was made in the course of the year spent under a system of ability grouping.

Opinions and Suggestions for Improvement

Graham (1958) stressed that evaluation of grouping programs is needed, and suggests questions that may be asked:

1. What is philosophy of staff in regard to underachievers?
2. What does teacher or supervisor have to offer these children?
3. Does teacher have microscopic vision to see this child who is underachiever?
4. Does teacher have telescopic vision that gives him long-range view of prognosis for this child?
5. What are standards of measurement used with underachieving pupil?
6. What resources are available to help teacher understand multiple problem of underachiever?
7. What resources are available to help teacher better plan underachiever's program.
8. What avenues of help are available to assist teacher to improve work with underachiever?
9. Are some pupils being incorrectly labeled as underachievers?
10. Are there objective evidences that the program for the underachievers is getting results? (Graham, 1958, p. 79)

Martinson (1960), in her study of programs for gifted pupils, wrote:

> During the experimental year, the participating teachers were asked to evaluate themselves and the program in which they were involved in relation to the following factors: Enthusiasm for plan, teaching skill, knowledge of subject-matter, appreciation of gifted pupils, values of programs, and problems in programs. Two evaluations were made during the year so that a measure of trends in attitudes was possible.
>
> On a five-point scale ranging from marked decrease to marked increase, the teachers in every plan rated their enthusiasm for plan far better than average, their teaching skill as increasing because

of participation, their knowledge of subject matter as increasing, and their appreciation of gifted pupils high. All of the plans were successful on the four factors, according to the teacher ratings.

. . . . . .

To obtain an evaluation of pupil performance and attitudes by parents, teachers and selves, the study staff devised a scale composed of sixteen factors, all judged important in evaluating the effect of programs. The same items, with some vocabulary variations, were reacted to by all parents and teachers of experimental pupils and by the pupils in experimental programs from fifth grade on. . . .

The items were (1) ability to solve problems; (2) knowledge of subject matter; (3) interest in school; (4) ability to see relationships; (5) research skills; (6) ability to work independently; (7) status in peer group; (8) critical thinking ability; (9) rapport with teacher; (10) motivation toward learning; (11) basic skills; (12) intellectual curiosity; (13) ability to accept responsibility; (14) ability to experiment with things and ideas; (15) self-understanding; (16) acceptance of leadership roles.

For summarization purposes, the items were grouped into six clusters. Three clusters were grouped in cognitive areas (having to do with skills in learning and knowledge), and three in non-cognitive areas (dealing with relationships and attitudes).

The pupils, who started at a high level of performance in the study, showed growth in every one of the six clusters. The growth was uniformly true at all grade levels. Subject-matter competence and self-understanding were two clusters with especially high ratings. (Martinson, 1960, pp. 5, 6.)

Krugman and Impellizzeri (1960) conceived underachievement as an action pattern with roots in early childhood experience, in present home and family conditions, in self-concepts, and in character. If this be true, they surmise that to get at the real problems, studies involving underachievers will have to be more clinical and individual in nature. Their study on the identification and guidance of underachieving gifted students satisfied weaknesses found in many studies. First, enough subjects were included to have an excellent sample: 3,200 experimental students and 1,700 control students were used from 39 high schools. Counseling work with teachers, work with parents, clinical services,

remedial work, testing and research were all part of the program to identify and develop talents--as well as to identify, prevent, or minimize maladjustment. This teaming up of parents, counselor, psychologist, social worker, doctor, and psychiatrist on case studies is deemed a new departure in guidance services.

Parker (1954) in a study of ways of providing for individual differences concluded:

> 1. Differences should be provided for. A teacher should cherish the difference between students.
> 2. The move of late has been to enrich curriculum rather than acceleration of pupils.
> 3. Homogeneous grouping is almost impossible for two, let alone 30 to 35. This does not exclude grouping as a whole.
> 4. Grouping is not effective unless accompanied by varied materials suited to the needs.
> 5. Free periods could provide for differences through prepared opportunities.
> 6. Grouping of children necessitates the grouping of teachers to these children. (Parker, 1954, p. 38)

He stated that there is no one method or basis to group students, but that a combination of a number of methods would probably best solve the problems.

In McCarthy's (1957) study to determine the effectiveness of a modified counseling procedure in promoting learning among bright underachieving adolescents, the measures used suggested that a predominantly non-directive orientation is ineffective in promoting learning among bright underachieving ninth-grade boys, but it is possible that factors inherent in the experimental design obscured evidence of academic gains.

> Since the experimental members appeared to identify with their own disguised cases, group counseling sessions directed toward the solution of such cases seemed to provide a beginning step in assisting underachievers to perceive themselves as their peers perceived them. But since the experimental members gave evidence of ego-defensiveness when their own cases became the focal point for discussion, they tended to offer resistance to recommendations made

> by peers; hence, an individual follow-up interview between the counselor and each counselee would probably enable the counselee to let down his defenses and gain insight more readily than he would be likely to do if he continued to meet with peer members. Furthermore, analysis of the content of the experimental members' verbalizations during the group counseling sessions revealed the need for information about the self; therefore, to render the individual interview most effective, the counselor should assume a somewhat more active role by providing the counselee with desired information concerning his own ability, aptitudes, interests, and goals. This study, then leads to the conjecture that non-directive group counseling sessions centered upon the study of disguised cases, when supplemented by an individual interview in which the counselor assumes a more directive role, will foster improved attitudes toward school and higher school grades among bright underachieving ninth-grade boys. (McCarthy, 1957, pp. 2, 3)

Calhoun (1956) assessed the effects of a program of individual counseling on the academic accomplishment of underachieving pupils in the eighth grade of the Gordon Junior High School in Coatesville, Pennsylvania. He found that the mean achievement age for the experimental group at the final testing exceeded by more than three months the control group. A t ratio of 1.66 indicated a probability of more than .10 that counseling did not bring about statistically significant improvement in achievement as measured by standard test battery.

As previously quoted from Shaw's study, "underachievement on the part of bright students is not a surface phenomenon, easily modifiable, but rather is related to the basic personality matrix of the individual." (Shaw, 1957, p. 199)

Cutts and Mosely (1958), in their article "The Disorderly Underachiever," suggested the following provisions for improvement:

> You and the lazy disturber in your class may find yourself at war with each other, a war that neither can win. The way to peace is to remove the cause of the trouble. Bad work and bad behavior march together because they are both set off by the same causes.
>
> Any difficulty in a student's home life is almost sure to affect his life in school. What are the value systems of the parents?
>
> Is the student's trouble rooted in poor habits?

> Be sure of your facts about your pupil. Use records, observe. Does he reveal sparks of interest; if so, over what?
>
> Confer informally with the student; help the student see the connection between hard, efficient study now and later success in achieving his goals. Confer with both parents if possible.
>
> Try to have the student assigned to a class and a course in line with his ability and achievement. Experiment with group work in your classroom and in homework and special assignments.
>
> Examine your program and methods. (Cutts and Mosely, 1958, p. 79)

In Martinson's (1960) study, the programs in which the pupils participated were planned within the general areas of Enrichment in the Regular Class, Acceleration, and Special Groupings. In these three general areas, 17 programs at various grade levels were evaluated. The programs and grade levels represented were:

1st Grade	Enrichment in the Regular Class
	Acceleration
	Ungraded Primary
	Cluster Groups
2nd Grade	Cluster Groups
5-6th Grades	Enrichment in the Regular Class
	Special Interest Groups
	Cluster Groups
	Special Class
	Saturday Class
8th Grade	Acceleration
	Special Classes
	Community Sponsor
11th Grade	Special Classes
	Independent Study
12th Grade	Honors Classes
	Acceleration to University and Junior College

> An attempt was made in the establishment of programs to choose a variety, and to plan them at selected grade levels throughout the elementary and secondary schools. (Martinson, 1960, p. 3)

MacLean (1958) stated that the solution to the problems of the underachiever cannot be placed upon the student, but must come in further development of processes of education. He suggests the following:

1. Basic research in the psychology of adolescent.
2. Improvement of tests and measurements.
3. More effective counseling and guidance by trained personnel.
4. Continuous study and revision of curriculum and co-curriculum.
5. Better pre-service and in-service education of teachers and administrators. (MacLean, 1958, pp. 69-72)

Johnson (1958) stated that the problem of the underachiever has taken its place alongside another problem--that of providing a program that will challenge the intellectually gifted child--and suggested that there is no reason why these two programs cannot be compatible. He said the solution requires a philosophy of providing equal, rather than identical, educational opportunities for all children. He suggested that the slow learner's fundamental educational problem lies, not in adapting the present program of instruction, but in constructing a unique curriculum designed to meet his specific needs.

> The low achiever, as seen in the high school, is not an entity, but presents a multiplicity of problems, each one requiring unique treatment and educational planning. Before any program can be embarked upon for children whose achievement is significantly below that of the group with whom he is placed, a complete educational and psychological diagnosis is essential. Slow learners require curriculums designed specifically in terms of their needs, characteristics, and potential. Remedial problems need supplementary services provided by a specialist in this area in order that they may learn to operate effectively in the educational environment designed for children of their ability level and potential. Children with unhealthy attitudes toward school require help in the development of more healthy and positive ones. Children with problems of adjustment require the supplementary aid of the psychologist and guidance counselor in order that they may live more effective lives, participate more effectively in society, and derive greater benefit from the learning experiences provided them. (Johnson, 1958, p. 74)

Krugman and Impellizzeri (1960) maintained that

> one of the major problems confronting this nation today is that of manpower shortages, particularly in technical and professional fields. Since all the potential manpower passes through the nation's schools at one time or another, educators have the prime responsibility for uncovering talent, whether palpable or hidden. (Krugman and Impellizzeri, 1960, p. 283)

They stated that most studies of underachievement have three weaknesses: (a) they deal with small numbers of subjects, (b) they are largely statistical and do not delve into problems of personality dynamically, and (c) they are generally limited to information gathering and seldom apply to treatment techniques. They suggested

> a new departure in guidance service--the teaming up of counselor, psychologist, and social worker, with medical and psychiatric service available--with "normal" children, as well as problem children, and with very young children. (Krugman and Impellizzeri, 1960, p. 286)

Katz and Horhous (1958) wrote:

> We hold ourselves accountable; today it is not a question of a program for all youth, but many kinds of programs for many kinds of youth. Underachievement is a lurking possibility in every aspect of our broad high school program. (Katz and Horhous, 1958, p. 87)

They suggested that for encouragement of capacity performance, schools should have:

1. Imaginative use of facilities
2. Breadth of program
3. Experimentation
4. Staff awareness (Katz and Horhous, 1958, p. 87)

Gibboney (1959), in his study of socio-economic status and achievement in social studies, selected two groups of sixth-graders: Group A from the upper middle class (35 pupils--19 boys and 16 girls), and Group B from the upper lower class (40 pupils--23 boys, 17 girls). Differences in intelligence were controlled by the use of covariance in the analysis of the achievement test scores. Group A achieved significantly higher than Group B, at the 5 per cent level of significance. His implications included the suggestion that teachers will be wise to accept the fact that social classes do exist in our society and

adapt their teaching to this reality. With children of higher social status, it may be especially important to challenge their intellectual and creative capacities. With children of lower social status, it may be especially important to develop a desire for learning to make up for the deprivations in their social environment. These children may need special help in mastering the basic academic and social skills, thus enhancing their chances of staying in school. This investigator's observation of the lower-class group in this experiment lead to the belief that this objective is attainable.

In Horral's (1957) study, "Academic Performance and Personality Adjustments of Highly Intelligent College Students," her conclusions were:

> In view of the over-all findings of this study, it seems certain that academic under-achievement for brilliant students is a symptom of deep-seated personality problems. Also, over-striving on the part of students of average ability who get high marks is clearly indicated and is associated with personality problems on their part.
>
> The students in this study for whom college appears to be wholesome are the brilliant students who are well enough adjusted to be free to use their intellectual potentialities to get good grades.
>
> In order of excellence of adjustment, it seems apparent in this study that sub-groups line up as follows:
>
> 1. Excellent adjustment: High-achieving brilliant students
> 2. Fair adjustment: Low-achieving students of average ability
> 3. Poor adjustment: High-achieving students of average ability
> 4. Very poor adjustment: Low-achieving brilliant students
>
> Whereas their native endowment seems to have given the brilliant students, as a whole group, many advantages in personal adjustment, nevertheless the circumstances of their lives, such as being grouped with less able children, being emotionally rejected by their parents, or some other factors, whatever they may be, have handicapped them with a compulsive defense against anxiety, and with an habitual disorganized procedure in thinking. (Horral, 1957, p. 81)

Her recommendations were:

> In line with the findings of the present study and in light of generally accepted principles of mental health, the writer recommends the following:
>
> 1. Special provisions in the public school system so that brilliant children can be placed with children their own mental age, either by acceleration or by special grouping, in order that they will be continually challenged to use their extremely high intellectual potentialities.
>
> 2. Relief for students of average ability, through administrative improvements, through parent guidance, through changing general social attitudes, or whatever may be needed, in order that they will not sacrifice good personal adjustment to get "good grades."
>
> 3. Mental hygiene clinics for parents and children, and expertly trained clinical psychologists in the school systems so that personality problems can be dealt with as soon as they develop instead of allowing them to build up into serious difficulties.
>
> 4. A more widespread use of projective tests so that levels of ego growth and personality development can be studied, and psychotherapy provided for such individuals as the low-achieving brilliant subjects in the present study. . . .
>
> 5. More awareness by university faculties of the problems and needs of brilliant college students and more homogeneous grouping of such individuals in order that they may be challenged and encouraged to develop to the fullest their unusual abilities for their own satisfaction and fulfillment, as well as for the benefit of society and the world at large, and in order that they may have the experience of building genuine close, warm friendships.
>
> 6. Psychiatric services, as well as a well-trained staff of clinical psychologists, at the University, in order that students who are very disturbed emotionally can be treated on an out-patient basis if they are able to maintain such status.
>
> 7. Finally, a more widespread working ideal that the real democratic process can only be put into effect when each individual, the very bright individual, as well as those at other levels of ability can have the opportunity to develop his native endowments and potentialities to the utmost. (Horrall, 1957, p. 82)

Wilson (1958), in his study of the problems in the motivation of gifted children, suggested that--

1. Schools must find out what the nature and the degree of the particular giftedness is of each child.

2. Parents and teachers should not neglect special abilities if they happen to be non-academic.

3. Schools should make generous provisions of materials, opportunities, and procedures.

4. A modified class procedure should be provided where daily assignments of textbook work must give way to group and independent investigations and projects, discussions, planning and evaluating sessions, and the cooperative carry-on of pupil-initiated activities.

5. Teacher education institutions should provide suitable programs of training for teachers of the gifted.

Summary

Review of studies of grouping

In the early 1800's plans were devised for "assembly-line" educational procedures. These were the forerunners of grouping and included such developments as graded textbooks, graded examinations, and eight-room school buildings--one room for each grade level. By 1920, grouping of students by superior, average, or low-ability had arrived with many variations for handling individual differences in students. Among these were forms of acceleration and retardation, time adjustments, and curriculum adjustments.

Current practices have added to the list the use of programmed learning, teaching machines, and individualized reading--all designed to permit each individual to progress at his own best speed.

Many types of grouping were mentioned: chronological age, graded textbooks, intelligence, wider-age-range, combining grades, reading ability, elective courses, ability and achievement, friendship, total behavior pattern, mental age, achievement scores, and combinations

of these and others. Most research reported ability and achievement grouping as being preferred. Stress was placed on keeping such grouping flexible so that a student might adjust from subject to subject and not become "pegged" in any one category.

In reviewing the literature pertaining to grouping, it was found that the majority of schools practiced some sort of grouping in addition to the traditional chronological age grouping. Studies in various areas of the United States showed grouping being practiced in 50 per cent of the schools--other studies showed it being practiced in 90 per cent. Otto (1953) reported 53 per cent of 1,598 city school systems using ability grouping in some form in one or more schools. Eales, Reed, and Wilson (1955) surveyed Los Angeles County, California, and found 36 out of 42 secondary schools using some kind of grouping. Conflict of opinions was found, however, as to the extent of grouping in this country--perhaps due, in part, to the fact that there are so many types of grouping that the term is not used synonymously by all investigators. Further research is needed to show a complete picture.

Literature and research
favorable to grouping

Evidence. Research studies that came to the attention of the investigator presenting evidence favorable to grouping were: Riley (1956), Theisen (1922), Kraraceus and Wiles (1938), Jackson (1934), Martinson (1960), Bennett (1953), and Marsh (1955).

Opinions and arguments. Seventeen arguments were found supporting grouping on the basis of its being better for the pupils.

Five arguments were found supporting the view that, from the standpoint of the teacher, grouping was desirable.

One writer stressed that homogeneous grouping made differentiation of curricula easier. Four arguments were found claiming that grouping would improve the administration of schools.

These opinions and arguments are outlined on pages 26 to 29.

Literature and research unfavorable to grouping

Evidence. Research studies that came to the attention of the investigator which were unfavorable to grouping were by Abramson (1959), Lorge and Mayans (1954), Rudd (1958), and Luchins and Luchins (1948).

Random selecting and reporting of available articles yielded only approximately half as many research articles reporting unfavorably as reporting favorably on grouping.

Opinions and arguments. Nineteen arguments were presented claiming grouping to be unfavorable to pupils; 10, unfavorable to teachers; 1, unfavorable to curriculum; and 7, unfavorable to administration. These arguments and opinions unfavorable to grouping are outlined on pages 33 to 36.

Social and other personality outcomes of grouping

Research favoring desirable social outcomes under grouping was reported by Riley (1956), Kraraceus (1938), Jackson (1943), Bennett (1953), Marsh (1955), and Mann (1957).

Eleven arguments and opinions out of a total of 27 stressed

desirable outcomes.

Research unfavorable to the social development or acceptance of pupils under grouping was presented by Rudd (1958) and Luchins and Luchins (1948). For the research studies in this area which came to the attention of the investigator, this represents a ratio of 1 to 3--2 studies against to 6 favorable studies. The investigators who found that grouping was either favorable or at least not harmful to social acceptance were: Martinson (1960), Mann (1957), Bedoian (1954), Muggenthaler (1955), Goldworth (1959), and Theisen (1922).

Causation and identification of underachievers

Environmental factors relating to underachievement mentioned in the literature were:

1. Good models in education and occupation in those they admire in home and community lacking (Goldberg, 1959; Russell, 1958)

2. Low educational level of family (Goldberg, 1959)

3. Unstable family structure (Goldberg, 1959)

4. Lower socio-economic status (Hollingshead and Redlich, 1958; Gibboney, 1959; Martinson, 1960; Stivers, 1959)

5. Ethnic and religious prejudice (Goldberg, 1959)

6. Rejection often by classmates for personal or caste reasons (Bedoian, 1954; Muggenthaler, 1955)

7. Often over-age in their peer group, causing rejection (Bedoian, 1954)

8. Environment too complicated for their abilities (MacLean, 1958)

9. Have often received indiscriminative coercive influence from teachers or others (Rosenfeld and Zanders, 1961; Fliegler, 1957)

10. Suffer more pressures (Goodlad, 1960)

11. Blocks to learning have been set up (Goodlad, 1960)

Personal factors relating to low achievement and underachievement mentioned in the literature were:

1. Dislikes or fears people--especially parental or authoritative figures, siblings, and peers (Goldberg, 1959; Winkler and MacNutt, 1960)

2. Unable to create warm relationships with others (~~Mathias, 1959;~~ Burdick, 1961; Bower, Tashnovian, and Larson, 1958)

3. Have lower unrealistic levels of aspiration (Winkler and MacNutt, 1960; ~~Bills, 1953;~~ Sears, 1940)

4. More often follow vocational goals set for them by others (Armstrong, 1955)

5. Have fewer vocational and other interests (Armstrong, 1955; MacLean, 1958)

6. Have stated goals not in line with their dominant interests (Armstrong, 1955; MacLean, 1958)

7. More prone to develop mental illness; more emotionally disturbed; have more difficulty in making non-academic adjustments (Jensen, 1958; Stone and Ganung, 1956; Ullmann, 1952; Bower, Tashnovian, and Larson, 1958)

8. Have lower threshold of frustration (Fliegler, 1957)

9. Have lower intelligence quotient (Jensen, 1958; Hinkleman, 1955; Bower, Tashnovian, and Larson, 1958; Frandsen and Higginson, 1951)

10. Have low self-concept of ability (Brookover, Velinsky, and Thomas, 1961; Goldberg, 1959; Bower, Tashnovian, and Larson, 1958)

11. Prefer to avoid conflicts (Armstrong, 1955)

12. Less cooperative, less dependable, have poorer judgment (Armstrong, 1955)

13. Prefer outdoor activity (Armstrong, 1955)

14. Prefer companions older than self (Armstrong, 1955)

Achievement differences under grouping

The majority of the writers in the field seemed to agree that grouping could offer a solution to many problems--perhaps the major ones being adaptation of teaching load, teaching methods, curriculum, and lesson materials to individual differences. This adaptation would subsequently increase motivation, economy of precious time, and a heightening of achievement. Grouping by ability seemed to be an aid in reaching these goals, but was generally criticized on ground other than increasing achievement.

Research

The following investigators presented research results in favor of grouping in relation to academic achievement: Polkinghorne (1950), Riley (1956), Kraraceus and Wiles (1938), Martinson (1960), Bennett (1953), Marsh (1955), and Barthelmess and Boyer (1932-33)--seven in all.

Evidence articles concerning academic achievement against grouping were presented by Abramson (1959), Lorge and Mayans (1954), Rudd (1958), and Jordan (1950)--four in all.

Subject matter areas

Significant achievement gains seemed to depend to some extent on the subject matter area. Some subjects automatically provide a degree of grouping; such as, trigonometry, foreign languages, chemistry, and stenography. Achievement grouping in reading and arithmetic seemed to be most favored, although there was not general agreement even here. In one study of retarded children, 50 per cent of the children achieved two to six times as high in arithmetic as they did in reading. Another investigator found that superior pupils did not benefit from separate grouping in geometry, but that inferior students did. Ancient history was another area in which significant achievement gains were found in grouped students. The impossibility of any group being even relatively homogeneous in all subject matter areas was clearly pointed out.

Research in arithmetic and mathematics. McElwee (1933), Rankin (1936), Cook (1924), and Barthelmess and Boyer (1932-33) presented research favoring grouping in these areas.

Opposed to grouping in these areas were one evidence report--Cook (1924), who reported unfavorably for grouping of geometry students of superior ability--and three opinions or arguments were expressed by Cook (1958, Ramey (1956), and Vredevoe (1955). Vredevoe expressed the opinion that grouping did not benefit all students equally well in all subjects.

Research in English and language. Four investigators presented research articles favoring grouping in English and language areas: These were: Rankin (1936), Barthelmess and Boyer (1932-33), Cook (1924), and Martinson (1960).

Research in social studies. Cook (1924) and Martinson (1960) also presented research favoring grouping in the social sciences.

No reports unfavorable to subject matter gains under grouping in English, language, or social studies came to the attention of the investigator.

Ability levels

Too, according to the literature, achievement gains seemed to vary on different ability levels. The consensus of opinion seemed to be that bright students gained the most by grouping; dull students, next. One investigator found positive correlation between intelligence and achievement; and the highest correlations were found between intelligence and arithmetic, reading comprehension, and language.

Gains were reported for all ability levels in academic achievement under grouping by two investigators: Theisen (1922) and Barthelmess and Boyer (1932-33).

Superior ability. Again, disagreement was found regarding even the grouping of bright students. For example, the following arguments regarding ability grouping were propounded, some of which are conflicting:

1. Bright students would lose the opportunity to help the average or dull children, and might not come to realize that slow pupils do have some contribution to make to the world.

2. They would be apt to develop superiority complexes. Conversely, competing with others of more equal ability would prevent this.

3. Grouping of bright students would not provide too competitive an atmosphere, but would contribute to more efficient use of ability and these students would progress more rapidly; they need competition to work to capacity. Conversely, some authors stated that homogeneous grouping for these students provided an atmosphere that was too tense--too competitive.

4. Again, others say they tend to form habits of idleness, inattention, and mental laziness when heterogeneously grouped.

5. Homogeneous grouping eliminates bright students from school first--when they are the ones that profit most from education. Conversely, they can be more quickly and better prepared for college through an accelerated course.

Gains for pupils of superior ability under grouping were reported by Cook (1924), Martinson (1960), and Goldberg (1959).

Inferior ability. Arguments for and against grouping of slow learners were:

1. Slow learners lose the stimulus, leadership, and help of the more advanced students in ability grouping. Conversely, they are not discouraged by the superiority of others, but can compete on equal terms and develop their own leaders.

2. Concentration of problems in one class leads to poor discipline. Good models are not available.

3. Under grouping, they develop a sense of failure and inferiority and feel jealous and resentful. They feel a stigma being placed in a lower group. Conversely, homogeneous grouping lessens pupil failure and discouragement and reduces amount of retardation, eliminates frustration of trying to achieve beyond ability, and adds to the happiness of students by removing the sting of failure and feeling of inferiority.

4. Some students deliberately do poor work in order to get into the slower groups so they will be required to do less work.

5. They profit least from education, yet must spend the most time in school. Conversely, a richer remedial program can be provided and a vocational course can be pursued rather than a pre-college curriculum.

Gains for pupils of inferior ability under grouping were reported by Nash (1942) and Cook (1924). Cook lists four specific instances of success with these students.

Average ability. One study, Barthelmess and Boyer (1932-33), claimed superior gains under grouping for students of average ability.

Relationship of Socio-economic levels to achievement

Gibboney (1959) found that in social studies, students from families with high socio-economic status made significantly better achievement.

Stivers (1959), in a study of 180 high school senior girls found that of 45 students in the top 25 per cent of the class on a socio-economic level, 32 expected to go to college.

Martinson (1960) found that out of 929 high achievers (493 elementary and 436 secondary students), only 2 per cent came from the lower socio-economic group.

Over-all results of grouping

Many studies included arguments for and against grouping. Attempts to accurately indicate the number of studies on either side is of somewhat questionable validity because some authors gave arguments on both sides. However, the majority of the research articles that came to the attention of the investigator favored grouping. This was indicated by the extent to which grouping is in general practice; the extent of academic achievement gains in arithmetic, mathematics, English, language, and social studies. Further weight was thrown in this direction by the gains made for the various ability levels--for gifted students especially it was found desirable, and to a more limited extent it was found to be helpful for students of inferior and average ability.

In addition, the majority of investigators giving research results concluded that grouping was not damaging to either student behavior or to peer acceptance.

Research on the socio-economic factor and its relationship to achievement indicated that fewer underachievers came from families with high socio-economic status.

Some writers indicated emotional bias in their views, and some indicated that they had not yet decided what was best. Many authors

have not yet crystalized their views, generally because the field is so complex and sufficient evidence has not yet been presented. At present, there is a growing body of reliable data on which investigators can begin to form sound opinions. There are no doubt many sources of information which did not come to the attention of the investigator which could throw additional light on this problem.

Cautions to be observed

The literature pointed out the great complexity of the problem of helping the underachiever. Both environmental and personal factors having a bearing, the literature seemed to be classified somewhat along these lines. While pointing out that grouping could be beneficial, most writers were careful to point out that care would be needed in setting up programs, and that provision for needed flexibility must be provided.

PROCEDURE

This study was a phase of the four-year research project in ability grouping being conducted at the Utah State University through a grant from the United States Office of Education. The project was under the direction of Dr. Walter R. Borg, Research Director. The first-year results of Dr. Borg's research pertaining to the establishment of mental maturity and achievement ratings were made available to the writer, as well as the use of the IBM office, tests, and other materials.

The California Short-Form Test of Mental Maturity had been given to a selected sample of fourth- and sixth-grade children in two adjacent Utah school districts during the month of October, 1958. The following spring, May, 1959, these same children were tested again--this time with the California Achievement Test. Each student's chronological age was also available as a part of the test information.

These data on a total of 1,468 elementary school children provided the starting point for the study. The differences in student achievement in relation to their expected age-grade placement were noted. The research design (described on the next page in detail) permitted a comparison of the differences in academic achievement between the students of various levels of ability, both within each district and between districts.

During the next school year, the sixth-graders had moved on to the junior high schools (both districts use the 6-3-3 plan), and the second phase of the study dealt with them exclusively. To keep the study within reasonable limits, no further attempt was made to work

with the former fourth-grade students.

Stratified-random samples of these now seventh-grade students permitted the study to be carried on in some depth with an effort being made to look closely at the circumstances which could conceivably have given rise to the noted differences in achievement.

Experimental Design

The 1958-59 phase of the study sought to discover if significant differences existed in the number of underachievers in the two school districts and the magnitude of the underachievement. The experimental variable for this part of the study was ability-grouping, as practiced in District A. The District R sample contained no students from ability-grouped classes and was used as the control group.

During the 1959-60 school year, the second part of the study was completed and will frequently be referred to in the writing as the follow-up study. This part of the work employed the method of differences and sought to determine the relationships between the stated hypotheses and the degree of achievement within each district. Comparisons here were also made for these factors between districts.

Underachievers were compared with normal achievers on three levels of ability. This stratification was made to help equate the samples from each of the school districts concerned. The three levels of ability were: students of above-average ability, students of average ability, and students of below-average ability. The cases needed for each group were drawn randomly from each level of ability. In District A, the three levels had previously been determined in the district by the

the following procedure:

An attempt was made to keep the number of boys and girls in each section approximately equal. After determining the tentative placement of all boys and girls into accelerated, regular, or developmental sections, a number of pupils equaling 5 per cent of the total number taking the class whose scores fell closest to the borderline between sections were rechecked against teachers' recommendations from the previous grade level. Where the placement levels differed two placement levels from the test recommendation, the child was retested and his placement determined by the retest.

In District R, where no cases were drawn from ability-grouped students, it was necessary to stratify them on the basis of their achievement. Cut-off points had been developed for District A, and equivalent cut-off points were used for District R.

Period covered

This study encompasses the 1958-59 and 1959-60 school years. Data from the CMM tests were gathered in October, 1958. Data from the CAT were gathered in May, 1959. The measures on study methods, emotional disturbance, achievement motives, index of social position, health and personal interview information were administered during the second semester of the 1959-60 school year. An assumption made here was that the students were continuing in essentially the same behavior patterns that they followed the year previous when the achievement data were combined.

Sample

Districts A and R are relatively large, consolidated school districts. The total enrollment of the two districts at the time was approximately 31,000 students. District A had an enrollment of 13,000 students, while District R had 18,000 students.

Both districts are part of Utah's system of public schools. School District R is a Class 2 city in a northern Utah county. School District A is that part of the same county not included within the city limits.

These districts have a large measure of local autonomy, derived from authority to act delegated to them through the State Board of Education, the State Legislature, and the State Constitution. A measure of control, however, is exercised by the State to provide teachers and educational programs of consistently high quality throughout the state. Ninety per cent or more of the teachers in both districts must be college graduates and must meet the same minimum certification requirements. Through the administration of the State Uniform School Fund, Utah school law imposes financial penalties upon districts which do not meet these standards.

The great majority of teachers from both districts received their education within the state from one or more of the following institutions: Weber College, University of Utah, Brigham Young University, or Utah State University. This fact was thought to provide some common goals and viewpoints among teachers of the two districts, thus reducing to an extent some variables which might otherwise have had a bearing on the study.

The proximity of the two districts, the similar socio-economic conditions, the closely parallel cultural and religious traditions, and the comparable school systems in nearly all aspects except the ability grouping factor practiced in District A, provided an unusually fine opportunity for a study in which each district could be examined as a unit in itself; and where, in addition, the two districts might be compared to determine the relationship of the ability grouping variable on achievement and certain selected personality factors. A better general control situation for this study than that provided by District R would be difficult to find.

The districts are adjacent and inter-twined. District R is predominantly urban. District A, in general, has a larger rural segment. However, the schools chosen for the sample from the two districts were matched, school for school, as being most nearly alike in terms of socio-economic status, geographic location, rural-urban environment, and pupil ability.

Four elementary schools from District A were matched with four elementary schools from District R. The data on achievement as related to ability grouping and non-ability grouping came from these elementary schools.

The sixth-graders from these schools moved to the junior high schools of the respective districts the next year. Follow-up studies were completed at the seventh-grade level. District A's three junior high schools were matched with the most nearly equivalent junior high schools from District R, and all samples came from these matched schools.

No Negro students were used in the sample to eliminate possible complicating variables.

The decisions on which schools were to be included in the sample were made with the unanimous approval of an ad hoc committee. The committee consisted of guidance and supervision people from both districts and a representative of the Bureau of Educational Research of the Utah State University.

Criteria for choosing the sample

The terms defined and the symbols used were:

XA = expected education age (the student's potential ability as expressed in total months)

EA = education age (the achievement of the student expressed in total months)

The education age was printed side by side with the expected education age by the IBM office. This facilitated getting the difference between these two factors. Each pupil in the sample was given a score which represented the difference between his expected education age in months, based on the Santa Monica Formula, and his obtained education age in months, based on the California Achievement Test Battery score.

The California Achievement Test Battery, Form W, was found to yield education age scores consistently higher than expected. The median education age of the students of both districts on the California Achievement Test was four months higher than the median expected from the test norms.

Two factors were considered in establishing the cut-off. One factor was the one just mentioned: test results being four months higher than test norms in each district seemed to substantiate the idea that the California Achievement Test may be a bit less difficult than

was expected. The second factor was that the test scores as printed by the IBM office were uncorrected scores, and a correction amounting to seven months was needed to make the two scores comparable because of differences in time of administration of the tests.

To obtain the mental ages of students for use in the Santa Monica Formula, the language section of the CMM test had been given in October, 1958. The CAT, Form W, was given to these same students in May, 1959--seven months later. Hence, the scores of the CMM could be thought of as being seven months behind the CAT; or, conversely stated, the CAT scores could be exptected to be seven months ahead because of the difference in test time.

Considering all factors involved, a correction of eleven months or more was considered necessary on the education age scores. A correction of eleven months was used.

An underachiever defined: A student whose corrected education age was seven or more months below his expected education age was classed as an underachiever. Information accompanying the Santa Monica Grade Placement Tables stated that student achievement below .5 of the grade norm is an indication that special assistance is needed.

Groups used in study and number of available cases

1. Sixth and fourth grades were used in determining number of underachievers.

2. Sixth and fourth grades were used in determining the magnitude of underachievement.

3. Sixth-graders alone were studied in greater depth during the following year when they were in the seventh grade of the junior high school.

4. Sub-groups in the sample:

Ability levels of underachievers

Boys:	Girls:
Above average	Above average
Average	Average
Below average	Below average

Ability levels of normal achievers

Boys:	Girls:
Above average	Above average
Average	Average
Below average	Below average

In comparing number and magnitude of underachievement within each district and between the two districts, a total of 676 students were used from District A and 792 students from District R; a total of 1,468 students. (See Tables 1, 2, and 3 in the Presentation of the Data section for breakdown.)

The number of cases available for study in each of the other various measures did not always match the number planned for in the experimental design. For example, only 5 above-average under-achieving girls were available in District A. In most cases, however, the desired number of cases was attainable. The designs for the follow-up studies are given on the following page.

The same students were used for the individual interviews as for the group tests, with the exception that only the odd numbers from the normal achievers were used because of the expense involved for the medical examinations and the time limits imposed during school hours on permitted student-investigator appointments.

Planned sample. Hypotheses No. 3, 4, and 5 (follow-up studies on study methods, emotional disturbance, and achievement motives):

	District A		District R	
	Boys	Girls	Boys	Girls
Underachievers:				
Above average	10	10	10	10
Average	10	10	10	10
Below average	10	10	10	10
Total	30	30	30	30
Normal achievers:				
Above average	15	15	15	15
Average	15	15	15	15
Below average	15	15	15	15
Total	45	45	45	45
District totals	150		150	
Total sample (both districts)	300			

Planned sample for Hypotheses No. 6 and 7 (individual interview and physical examination:

	District A		District R	
	Boys	Girls	Boys	Girls
Underachievers:				
Above average	10	10	10	10
Average	10	10	10	10
Below average	10	10	10	10
Total	30	30	30	30
Normal achievers:				
Above average	8	8	8	8
Average	8	8	8	8
Below average	8	8	8	8
Total	24	24	24	24
District totals	108		108	
Total sample (both districts)	216			

All students were chosen randomly from within the various strata (ability groups) of the seventh-graders who had previously been the sixth-grade sample for Hypothesis No. 2.

A stratified-random sample of 300 students was used for the California Study Methods Survey, Thematic Apperception Test, and "Thinking About Yourself" (the emotional disturbance measure).

The sample for the individual interviews and the health examinations consisted of 216 cases, selected again on a stratified-random basis.

Deriving Expected Education Age

A practical and sensible way of determining underachievers was needed. The idea for the method finally selected came from the Santa Monica Unified School District where a method had been devised and was being used as late as 1959. Private correspondence with the Director of Guidance of the Santa Monica School System, Mrs. Rosalie Waltz, provided this information. She gave no indication of plans other than to continue its use.

An illustration of the rationale behind the formula is as follows:

MA = mental age

CA = chronological age

XA = expected education age

$$\text{Formula} = \frac{2MA + 1CA}{3} = XA$$

The effect of this formula is to lower the weight allowed to mental age, it being conceivable that a student on his own initiative is unlikely to progress as rapidly in mathematics, for example, as he might in the language areas. Motivation, tools, goals, and other

factors negate the acceptance of mental age alone as being the only criterion upon which the expected achievement is determined.

Illustration:

Assume a MA of 13 years and a CA of 12 years:

MA of 13, less 6 pre-school years = XA of 7.0
(entire weight on MA)

$$\frac{1MA + 1CA}{2} = \frac{13 + 12}{2} = \frac{25}{2} = 12.5 \text{ less } 6 = 6.5$$
(equal weight on both factors)

$$\frac{2MA + 1CA}{3} = \frac{26 + 12}{3} = \frac{38}{3} = 12.7 \text{ less } 6 = 6.7$$

This last formula shown was chosen as a practical and rational method of obtaining the expected education age. The IBM office converted these expected grade placements to an equivalent figure in months for the sake of convenience. After obtaining the difference between this figure and the education age and setting the cutting point as described, the underachievers were tallied for both sexes in all groups in the two districts.

Statistical Procedures

Total number of cases, percentage of cases, and tests for significance were used in the statistical analysis. Significant differences were determined on the hypotheses by the use of the standard error of the difference between means and the *t* test, or by the use of chi square.

Comparisons of boys versus girls in each group of both districts were made as one of the first steps in the analysis. Where no significant differences existed between them, they were grouped together to provide a larger sample. (See Presentation of the Data section.)

Where no significant differences existed between districts, the research became a descriptive study of underachievement and grouping.

The specific comparisons made can perhaps most clearly be seen in the tables respecting the various comparisons and measurements made. In interpreting the data, note that a finding significant at the 1 per cent level could be expected to occur 99 times out of 100; at the 5 per cent level, 95 times out of 100; and at the 10 per cent level, 90 times out of 100.

Measures Used

California Short-Form Test of Mental Maturity

The California Short-Form Test of Mental Maturity, 1957, S-Form (for grades four through eight) was used in the identification of underachievers. This test samples mental processes in four areas: spatial relationship, logical reasoning, numerical reasoning, and verbal concepts. It was suitable for group administration--an economy in time over individual intelligence tests. As used in this study, the primary purpose of the test was to obtain mental ages and intelligence quotients needed for establishing the expected age-grade placement of students.

Buros (1959) has this to say regarding the test:

> In the original form, the conceptual framework for the California Test of Mental Maturity was that of the Stanford-Binet scale. The fuller version has been in use for over 20 years. The experience and the mass of data thus accumulated has been freely utilized in progressively improving the shortened series. The outcome is one of the best sets of group tests at present available. The reliability has been assessed by various methods. With the Kuder-Richardson formula 21, the reliability of the total scores varies between .87 and .89 at most grade levels, but at the secondary stage (as one might expect) it is appreciably higher. The validity coefficients consist of observed and corrected correlations with the

> Stanford-Binet, UISC, and with group intelligence tests. They vary far more widely, averaging about .75. But correlations of this nature are not very informative. (Buros, 1959, p. 434)

California Achievement Test

The California Achievement Test was used to obtain data on subject-matter gains for comparing groups and districts for Hypothesis No. 2.

> The thoroughness with which the authors report empirical evidence regarding the construction of tests is noteworthy. Reliability coefficients are uniformly high for the various levels and the item discrimination data are indicative of the efficient functioning of nearly all items. Coefficients of correlation between scores on the new edition and other standardized achievement test scores reflect a high degree of construct validity.
>
> In summary, the 1957 edition of the California Achievement Test represents a well-constructed achievement test battery designed to measure the basic fundamentals of reading, mathematics, and language from grades 4 through 14. This test battery has many desirable features and can be recommended for the measurement of general achievement at the grade levels indicated. (Buros, 1959, p. 8)

The scores in reading, mathematics, and language for elementary grades four, five, and six were used to measure pupil achievement and revealed the grade placement of pupils in relation to the general school population. This information was necessary in establishing the number of underachievers and the magnitude of underachievement in the two districts. The CAT was administered in May, 1959.

California Study Methods Survey

The California Study Methods Survey for grades seven to thirteen is a self-report inventory designed to reveal the essential nature of the study methods and attitudes of the student, and was used in testing hypothesis No. 3. The California Study Methods Survey is made up of

150 standardized questions which reflect the consistent differences in study methods and attitudes between high-achieving and low-achieving students. The survey is designed to yield four scores: attitude toward school, mechanics of study, planning and system, and verification. The verification scores empirically identifies students who do not give conscientious and valid answers. The total battery score was used in the study. (See Ch.— for further desc. of this test.)

The reliability coefficients and related data for the California Study Methods Survey, Grade 8, were as follows: Total scores for attitudes toward school, mechanics of study, and planning and system--r = .85; mean, 86.1; S.D., 15.2; and S.E. Measure, 6.0. The coefficients were computed by using Kuder-Richardson formula 21. The means, standard deviations, and standard errors of measurement were all reported in raw scores.

Validity data for the survey, which have been in the developmental stage for over ten years, were presented in various forms. These included discussions on construct validity, content validity, concurrent validity, and an intercorrelation matrix.

In regard to correlation coefficients and related data for the California Study Methods Test versus the California Test of Mental Maturity and grade-point averages, 1956, five factors were compared: (1) self-confidence, morale, and personal adjustment; (2) scholarly drives and values; (3) mechanics of study procedure; (4) planning, system, and effective use of time; and (5) self-confidence, morale, and personal adjustment. The total study test score correlation with I.Q. was .30; correlation with G.P.A., .50. Correlation of grade-point average with

I.Q. was .57. Partial r between achievement and study test total score, holding I.Q. constant, was .44. Partial r between I.Q. and achievement, holding study test total score constant was .47. Multiple correlation of achievement with combined I.Q. and study test total score was .68.

In regard to predictive validity, evidence from testing a new group of 174 high school sophomores indicated that the revised test is useful for prediction of high school achievement. Not only is the new test better than the older test, but the measures of mechanics of study procedure yield correlations of .53 and of .47 with grade-point averages.

As to content validity, the Survey was originally made up of four groups of items designed to measure morale, scholarly values, mechanics of study, and planning and system. Each of the four groups was composed of many more items than were ultimately to be used. The items were administered to large groups of students and subjected to item analysis techniques designed to identify the items that discriminated most effectively between the high- and the low-achieving students.

In testing for concurrent validity, the survey was administered to numerous groups of high school and college students for the purpose of determining its relationship with academic achievement. In each of these studies, the scale scores and the total score showed very significant coefficients of correlation with grade-point averages. This was also true when the effects of intelligence was partialed out. In each sub-test and the total, the coefficient of correlation was higher with grade-point average than with intelligence. The multiple R of the Survey and intelligence quotient with grade-point average of .75 is extremely high.

"Thinking About Yourself"

The "Thinking About Yourself" (Bower, 1958) inventory was used to measure the degree of emotional disturbance in students in testing Hypothesis No. 4.

The development of the "Thinking About Yourself" inventory was based upon the assumptions that if a child with a developing personality disorder can be identified early, he can be helped most effectively to remedy the condition causing the disorder, and that personality disorders in adulthood are the result of a progressively developing condition assessable in children's personalities and behaviors. This test recognizes the difficulties involved in the interpretation of behavior under varying circumstances: knowing what constitutes mental health, determining what is normal or abnormal regarding flexibility and rigidity in personality, and the extent to which a person lives his own life or is compulsively "other directed."

It utilizes the intra-individual measures of two concepts--that of self, and that of wanted or desired self. In the personality inventory, the "self" is that which the child can afford to reveal in his answers to the questions, "Are you like him?" and "Do you want to be like him?"

	Most of the time	Often	Not very often	Seldom or never
Are you like him?		X		
Do you want to be like him?				X

The complete test is reproduced in the Appendix.

The sums of the differences or discrepancies between "self" and "wanted self" was used to determine the amount of emotional disturbance among children who were underachievers as compared to students who were normal achievers.

Scoring procedures utilized the difference between the child's ranking of the first question and his ranking of the second question. For example, in the above illustration the discrepancy score would be 2. If the choices had been placed in the opposite extremes on a given set of questions, the discrepancy score would be 3. If the choices had been placed one above the other, the discrepancy score would be zero. The column "most of the time" has a weight of 1; "often," 2; "not very often," 3, and the last column, "seldom or never," has a weight of 4.

In the score given for the choices marked in the sample on the preceding page, the discrepancy score was arrived at as follows:
$4 - 2 = 2$.

After obtaining the discrepancy scores for each set of questions, the scores were summed to get the student's total discrepancy score. The larger the score, the greater was the student's emotional disturbance, because of the divergence between his "self" and "wanted self."

The mean, standard deviation, and standard error were calculated for each group. The difference between group means was determined and the difference between means was analyzed for significance by the standard error of the difference between means technique.

Thematic Apperception Test

The Thematic Apperception Test (TAT) is a projective technique, based on the primary assumption that in completing or structuring an incomplete or unstructured situation presented by means of a picture, the student may reveal his own motives, goals, strivings, dispositions, and conflicts.

For the purposes of this study, four picture cards were used: 1, 2, 4, and 16--to test Hypothesis No. 5. Group administration was employed by flashing the picture on a screen and having the students write their responses. John (1960) found that these particular cards were most productive in revealing achievement motives. The analysis of the stories told was limited to achievement motives only. The Atkinson (1958) scoring system for achievement motives was used. (See Appendix B for TAT scoring form.)

For a test of scorer reliability, some of the cases were scored twice and Pearson r's were run to establish the relationship of the first to the second score. In the total study 24 sub-groups were used--12 groups of boys and 12 groups of girls.

Step 1. Following the administration of the test, the stories were scored using the Atkinson system (1958).

Step 2. As a trial run, 6 of the 24 groups were selected to be scored twice. Before the second scoring, the names, scores, group level--in fact all identifying factors were covered by stapling slips of paper over them.

Step 3. From the remaining 18 groups, two cases were selected randomly from each group, giving 36 cases. Identification was again

covered.

Step 4. These 36 randomly-selected cases (two from each of the remaining 18 groups) were then shuffled in with the 30 cases of the six groups selected for rescoring in Step 2, and all were rescored.

Step 5. First and second scores for all cases were recorded. First score means and standard deviations were computed, and the same was accomplished for the second scores for the first six groups. A Pearson r was then run between the first and second scores. The r was .81. Step 5 was repeated for the first and second scores of the 36 cases. The r was .91. The investigator felt that this reliability was adequate.

Other measures

To test Hypothesis No. 6, a questionnaire was developed and used as a guide by the investigator, the medical doctor, and the nurses to provide uniformity in the approaches made to students during the health examination and individual interviews. (See Appendix C, Individual Interview form.) The questionnaire included--

1. The modified Hollingshead Occupational and Educational scales, used by the investigator to determine the Family Index of Social Position.

2. Two questions for revealing the student's self-concept.

3. Four questions for the purpose of revealing home conditions and parents' attitude toward school.

The questions asked were of such a nature that a quantitative score could be assigned to each one for statistical procedures.

In order to arrive at a reliable figure which would represent the

socio-economic status of the student's home environment, it became necessary to decide on an index of social position. Three systems emerged as most applicable to the needs of this study. They were: Vaughn (1958), "A Scale for Assessing Socio-Economic Status in Survey Research"; Hollingshead (1958), "Index of Social Position," as discussed in his text, Social Class and Mental Illness; and the Alba Edwards system of classifying occupations into socio-economic groups used by the United States Bureau of the Census.

All three gave major importance to the occupation of the chief wage earner and to his education. Home ownership was also a consideration. Inasmuch as it was shown that a high degree of reliability could be obtained by the use of the occupation and education of the chief wage earner alone, a modified Hollingshead approach was used, based on these two factors in lieu of the usual three.

The Hollingshead Educational and Occupational seven-point scales were marked at the time of a personal interview with each student by the researcher. The final result yielded the placement of the family into one of five social classes.

An explanation of the modification of the Hollingshead scale and its reliability follows. It will be noted that the higher scores indicate the lower social conditions. Hollingshead (1958) shows the inter-correlation of education and occupation to be .906. When the criterion is predicted from three variables (judged class with)--residence, education, and occupation--the correlation is .942 (Hollingshead, 1958, pp. 391-396).

Hollingshead's determination of family index of social position (3 factor)

	Scale	Weight	Min.	Max.	Range of Scores	Class
Residence	1-6	6	6	36	20-31	I
Occupation	1-7	9	9	63	32-55	II
Education	1-7	5	5	35	56-86	III
			20	134	87-115	IV
					116-134	V

Manning's determination of family index of social position (2 factor)

Occupation	1-7	9	9	63	14-22	I
Education	1-7	5	5	35	23-41	II
			14	98	42-63	III
					64-84	IV
					85-98	V

To test Hypothesis No. 7, a case history form was filled out on each student represented in the sample by the City and County Nurses, and a health examination was given by a practicing physician. These measures were used to determine if differences in physical health of students representing the various groups were significant factors in academic achievement.

The directors of the City and County Health Center and the nurses assigned to the various schools met in conferences with the investigator to determine health measures of most value and to effect an efficient and professional individual physical health examination of each student.

It was decided that clinics could be set up in the schools, if administratively approved, where nurses and doctor could privately examine each student. The step following the receipt of district approvals was to have the school nurses visit the homes where case history data were obtained from the parents of the students.

An examination blank prepared from data compiled by the Iowa Child Welfare Center served as the basis for determining whether or not height and weight were within standard norms. A second examination blank (see Appendix D, Health Inventory) was prepared covering identification information; case history; diseases and complications; check lists for albumin, sugar diabetes, hemaglobin, vision, hearing, etc. See Table 8, page 174, for a complete list and the results of the survey.

A practicing pediatrician was paid to make the physical examinations, which were given at the respective schools and required about 15 minutes each.

Following the health examination, each student met with the investigator in private and responded orally to the questions on the questionnaire that related to achievement motives, self-concept, home conditions and parents' attitude toward school. Their answers were assigned a quantitative score.

To assign a quantitative score to interview items 8, 19, 20, and 21, the person was given a score equal to the number of "yes" responses. In other words, if all four items were answered "yes," he would receive a score of four. If no items were answered "yes," he would receive a score of zero, etc. These four conditions related to home conditions

and parents' attitude toward school.

To classify vocational goals, if the person had no goal (Item 9), a score of one was recorded; if he listed more than one alternative goal, a two was recorded; and if he had a definite goal, a three was recorded. For Item 10 the same scoring system was used as in Item 9.

For Item 11, the five alternatives were coded 1, 2, 3, 4, and 5, respectively. On Item 12, the following codes were used: (1) go to college, (2) probably go to college, (3) get a job, (4) probably get a job, (5) get married, (6) undecided, and (7) combinations of the above.

The conversion of the educational and occupational scales and their conversion to a Class Index of Social Position was previously explained.

Health data comparisons were analyzed for significance by means of chi square. An example of the form is given below:

	Health problem	No health problem
All District R Underachieving boys		
All District R Underachieving girls		

The dichotomy of "health problem" - "no health problem" had as its line of demarcation three or more identified problems discovered at the time of the physical examination. If the student had fewer than three identified problems, he was classed as having "no health problem."

Parents' attitude toward school, and the comparisons on the Index of Social Position were analyzed for significance by the standard error of the difference between means technique.

PRESENTATION OF THE DATA

This part of the study involved both fourth- and sixth-grade boys and girls from both districts. Academic achievement data were collected on 676 students from District A and 792 students from District R--a total of 1,468 cases. The measures used and the purposes of the measures have been explained in the Procedure section.

Comparisons testing each of the seven hypotheses were made and will be discussed. Chi square analysis was done on three of the factors: number of underachievers, differences in sex, and health. The other factors measured and tested were: magnitude of underachievement, study habits, emotional disturbance, achievement motives, and home conditions.

Sex Differences

This factor was tested first in each of the comparisons in order that the data for boys and girls could be combined to make a larger sample if no differences were found. Therefore, the first hypothesis stated: "There are no significant differences related to sex between boys and girls in regard to the following hypotheses." On the basis of the data, this hypothesis was rejected. As the discussion and tables showing the data fall naturally under the presentation of the data on Number of Underachievers, this information will be given there (see pages 121 to 123 and 125 to 129).

Number of Underachievers

The second hypothesis, part (a), stated that no significant differences would be found in the number of underachievers in the two districts surveyed. Comparisons were made of the total number of students from each district, sex differences, grade-level differences, ability-level differences, and over-all patterns.

Table 1 shows the number and distribution of underachievers and normal achievers in District A, as determined by the use of the Santa Monica Formula and its application to the results of the California Achievement Test.

Table 2, page 122 gives similar data from the District R sample.

Table 3, page 123 presents these same data in summary form, with the addition of percentages.

Chi square analysis and results

The next step in the analysis of these data was to test them for significance by the use of chi square contingency tables. The questions posed and the results noted follow. An example is shown for one comparison only, Chi square 1. The others (Chi square 2 through Chi square 11) were analyzed in a similar fashion. Chi square 12 and 13 are contingency tables designed to show differences in the over-all patterns of underachievement among fourth- and sixth-grade students from both districts.

Table 1. The distribution of underachievement and normal achievement in District A, grades four and six

	Grade IV	Grade VI	Both grades
Total No. boys in sample	155	208	363
Total No. girls in sample	127	186	313
	282	394	676
Ability levels of underachievers and number of underachievers			
Boys:			
Above average	3	10	13
Average	13	19	32
Below average	11	31	42
Total boys	27	60	87
Girls:			
Above average	1	5	6
Average	4	11	15
Below average	6	10	16
Total girls	11	26	37
Total boys and girls	38	86	124
Ability levels of normal achievers and number of normal achievers			
Boys:			
Above average	40	56	96
Average	47	47	94
Below average	41	45	86
Total boys	128	148	276
Girls:			
Above average	61	68	129
Average	37	55	92
Below average	18	37	55
Total girls	116	160	276
Total boys and girls	244	308	552

Table 2. The distribution of underachievement and normal achievement in District R, grades four and six

	Grade IV	Grade VI	Both grades
Total No. boys in sample	163	254	417
Total No. girls in sample	160	215	375
	323	469	792
Ability levels of underachievers and number of underachievers			
Boys:			
Above average	14	36	50
Average	16	37	53
Below average	14	27	41
Total boys	44	100	144
Girls:			
Above average	5	28	33
Average	9	9	18
Below average	2	9	11
Total girls	16	46	62
Total boys and girls	60	146	206
Ability levels of normal-achievers and number of normal achievers			
Boys:			
Above average	67	79	146
Average	32	46	78
Below average	20	29	49
Total boys	119	154	273
Girls:			
Above average	89	96	185
Average	36	57	93
Below average	19	16	35
	144	169	313
Total boys and girls	263	323	586

Table 3. Summary of achievement

	District A		District R	
	Cases	Per cent	Cases	Per cent
Underachievers				
Boys	87	12.87	144	18.18
Girls	37	5.47	62	7.83
Total	124	18.34	206	26.01
Normal achievers				
Boys	276	40.83	273	34.47
Girls	276	40.83	313	39.52
Total	552	81.66	586	73.99
Total cases available	676	100.00	792	100.00

Total district comparison

Chi square 1. Is the combined number of underachievers significantly greater in District R's fourth and sixth grades than it is in District A's fourth and sixth grades?

	Underachievers	Normal achievers	
	(152)	(524)	
District A	124	552	676
	(178)	(614)	
District R	206	586	792
	330	1138	1468

Independence values

$$\frac{676 \times 330}{1468} = 152$$

$$\frac{676 \times 1138}{1468} = 524$$

Per cent underachievers:

District A 18.34

District R 26.01

x^2

$$\frac{28^2}{152} = 5.16$$

$$\frac{28^2}{178} = 4.40$$

$$\frac{28^2}{524} = 1.50$$

$$\frac{28^2}{614} = 1.28$$

Total $x^2 = 12.34$, 1 d.f.*

*Note that 6.635 is needed for significance at the 1 per cent level with one degree of freedom, and 3.841 would be needed to be significant at the 5 per cent level. Justification for these figures may be found in Garrett (1959, p. 450).

The above result is significant beyond the 1 per cent level, meaning that there are significantly more underachievers in District R than in District A.

Discussion. The data obtained on Hypothesis No. 2 constitute one of the major findings of the study. They indicate that the significant difference on part (a), the number of underachievers in the two districts, has a direct relationship to ability grouping as practiced by District A. As factors other than the grouping variable were carefully equated, and as no differences at the 1 per cent level of significance were found in the other factors measured in over-all district comparisons, the inference became stronger that differences found in achievement were more likely the result of the one known variable--ability grouping.

Sex differences

Chi square 2. Are there significant sex differences in the underachievement in District A, grades four and six?

Results: There were significantly more boys than girls who were underachievers in District A. The significance was beyond the 1 per cent level. The chi square was 15.90, with 1 d.f.

The percentage of underachievers in District A: boys, 23.97 per cent; girls, 11.82 per cent.

Chi square 3. Are there significant sex differences in the underachievement in District R, grades four and six?

Results: There were significantly more boys than girls who were underachievers in District R. The significance was beyond the 1 per cent level. The chi square was 34.09, with 1 d.f.

The percentage of underachievers in District R: boys, 34.53 per cent; girls, 16.53 per cent.

Discussion. It has been observed that there were significant sex differences in both districts, with more than twice the number of boys classed as underachievers than girls. This agrees with the findings of other researchers. Stroud and Lindquist (1942) found differences favoring the girls for grades three to eight in all subjects tested except arithmetic.

> In general, the girls establish a definite superiority in educational achievement during the elementary grades, but much if not all of their advantage disappears by the time high school is reached. Perhaps this is because different elements are emphasized in high school. History and science tend to replace some subjects such as spelling and handwriting in which girls generally excel. However, girls do maintain their superiority in English usage throughout the high-school years. (Smith and DeChant, 1961, p. 92)

There are a number of possible explanations to this general trend. One might be the earlier maturation rate of girls. Girls generally reach maturity about a year and a half earlier than boys. This earlier maturity might affect the mental as well as the physical development. In a study by Anderson, Hughes, and Dixon (1957), among children of 100 I.Q. or less, the girls tended to show superior achievement. There were few if any differences in achievement when boys and girls of high I.Q. (130 or more) were compared, however.

Another explanation might be in inherent sex differences and the roles males and females are called upon to play in our society. Even in the animal kingdom, the female generally is more docile, less physically active, of a gentler nature, more amenable to discipline, more pliable, and more anxious to please than the males. We may speculate that through the ages the female has had to use means other than brute strength to obtain her desires; while the male tends to be the athletic, acting out, or aggressive type. Harris (1956) suggests

that the girl's weaving, sewing, and doll-play activities may help to develop fine manual skills and improve near-point vision. This development probably helps girls achieve in school.

Closely related to inherent sex differences and the roles played is the difference in interests manifested by the sexes. Boys' interests in general tend to be in the area of physical activities. Perhaps the answer is in the Bible, "The glory of young men is their strength: and the beauty of old men is the gray head." (Proverbs 20:29) A more recent authority, Cole (1956), studied the interests of boys. Of 23 major interests, sports held the No. 1 position.

If the interests of boys do not lie primarily in academic learning, and if the converse is true for girls, it would appear that a lower mark in the case of a boy would not be so much of a threat to his self-concept as it would be in the case of a girl. Winkler and MacNutt (1960) were quoted in the literature section of this study as having found that "girl underachievers have more personality problems than boy underachievers, apparently because it is a threat to a girl's self-concept." Can a person truly be called an underachiever if he fails to advance as rapidly in an area which is of little interest to him? The investigator feels that the problem of interests may be the major factor in the underachievement of boys. Boys' interests do not run as strongly to books and to the confinement of the classroom.

Another important factor is that girls do better than boys in reading achievement. Findings show that they learn to read earlier and fewer of them become reading disability cases. Many studies (some done in other countries) show a ratio of 2 to 1, and the ratio of boys to girls at the Boston University Educational Clinic who have

reading difficulty has been as high as 10 to 1 (Smith and DeChant, 1961, pp. 91-2).

> Monroe, trying to account for the differences between boys and girls, suggests that the incidence of those constitutional factors that hinder progress in reading may be greater among boys. Gallagher indicates that the difference might be explained on the basis of heredity and suggests that a substantial deviation in the language mechanism may be a primary cause of reading disability. Sheridan also suggests that girls, even those of lesser intelligence, have a superior language sense. Some writers stress maturational differences, particularly in emotional and intellectual development. Others intimate that girls possess a natural advantage of interest in verbal rather than mechanical or athletic activities. (Smith and DeChant, 1961, p. 93)

Betts observes:

> First, there is some evidence to the effect that girls are promoted on lower standards of achievement than boys are. Second, girls use reading activities for recreation more often than boys do. Third, there is a need for more reading materials to challenge the interests of boys. (Betts, 1957, p. 137)

Another interesting factor in regard to reading achievement is that in all instances the average performance of the girls was superior to that of the boys, but the boys showed greater variation among themselves. The differences in achievement among boys themselves were greater than the differences between girls and boys (Smith and DeChant, 1961, p. 94).

Another factor may be the over-feminization, the prevalence of women teachers, in the schools. Ayres (1909) concluded that schools were better fitted to the needs and natures of girls than of boys. St. John (1932), in a study of 500 boys and 450 girls in grades one to six, agreed with this and pointed out that

> . . . the consistent inferiority of the boys in school progress and achievement is due chiefly to a maladjustment between the boys and their teachers which is the result of interest, attitudes, habits, and general behavior tendencies of the boys to which the teachers (all women) fail to adjust themselves and their school procedures as well as they do to the personality traits of girls. (St. John, 1932, p. 668)

As considerably more men are now entering the teaching profession, especially on the elementary level, the effect of this factor on boys' achievement should change for the better.

Grade-level differences

Chi square 4. Is there a significant difference in the underachievement in grades four and six in District A?

Results: There were significantly more sixth-grade underachievers than fourth-grade underachievers in District A. The significance was beyond the 1 per cent level. The chi square was 7.94, with 1 d.f.

The percentage of underachievers in District A was: fourth grade, 13.47 per cent; sixth grade, 21.83 per cent.

Chi square 5. Is there a significant difference in the underachievement in grades four and six in District R?

Results: There were significantly more sixth-grade underachievers than fourth-grade underachievers in District R. The significance was beyond the 1 per cent level. The chi square was 15.65, with 1 d.f.

The percentage of underachievers in District R was: fourth grade, 18.58 per cent; sixth grade, 31.13 per cent.

Discussion. Why are there more underachievers among sixth-grade students than among fourth-grade students? It has been noted that this was true in both districts, amounting to a general trend. Some possible explanations include differences in teaching methods. Sixth-grade teachers have at least partially discontinued the practice of grouping

within the classroom, which is seen as a desirable practice in the primary grades.

The spread of differences in mental age is increasing. Slow students do not tend to catch up; they get farther and farther behind. On the other hand, the superior students, with their additional acquisition of knowledge, have new tools with which to speed their progress. This, coupled with their native advantage, allows them to pull ahead achievement-wise of their less gifted classmates. Cook (1958) has been quoted as stating that in the typical sixth-grade class there can be found a range of approximately eight years. So while the spread is not great in the first grade, by the time the sixth grade is reached, one might expect to find achievement ranging all the way from the second to the ninth grade.

Furthermore, students are expected to rely on their ability to read to solve many problems without teacher help. Through reading they gain subject matter information on their own, and the child who has become adept at reading has many more ways of solving his problems than does the child who is an inadequate reader. It is conceivable that with excellent teaching and motivation, the gains of the superior students could be made to offset the effects of the lower ones, but the focus of teacher attention is as a rule beamed toward the middle group and the slow ones. Some teachers are not willing to move to a new concept until all children in the class understand the present one. It is a situation similar to the driver who takes the cows to the pasture and cannot shut the gate until the last cow is within. Some of the brighter students become bored and necessarily suffer under this kind of teaching.

Another explanation is that by the time students reach the sixth grade, the gang age is beginning to wane, although membership in their own sex is still important. Earlier, the competition between boys and girls was a good source of motivation. Some students now are beginning to develop boy-girl interests and other social interests. The greater the extent of these attractions, the less time and interest they have for academic learning. It is conceivable that this age of differentiated interests could play a part in the sixth-grade student's lessened achievement as compared with students of the fourth grade.

Curriculum and method may not be related to content of tests used.

Ability level differences
and over-all patterns

Chi square 6. Is the proportion of ABOVE-AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among fourth-grade boys and girls?

Results: There were significantly more above-average underachievers than other underachievers in District R as compared with District A on the fourth-grade level. The significance was beyond the 5 per cent level. The chi square was 5.97, with 1 d.f.

The per cent of District A above-average underachievers was 10.53.

The per cent of District R above-average underachievers was 31.67.

The per cent of above-average underachievers in the total sample was: District A, 1.42 per cent; District R, 5.88 per cent.

Chi square 7. Is the proportion of AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among fourth-grade boys and girls?

Results: The proportion of average underachievers to total underachievers was not significantly greater in District R as compared with District A among fourth-grade boys and girls.

The percentage of District A underachievers who had average ability was 44.74 per cent.

The percentage of District R underachievers who had average ability was 41.66 per cent.

Chi square 8. Is the proportion of BELOW-AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among fourth-grade boys and girls?

Results: The proportion of below-average underachievers as compared with total underachievers among fourth-grade students was not significantly greater in District R than in District A.

The percentage of District A fourth-grade underachievers who had below-average ability was 44.74 per cent.

The percentage of District R fourth-grade underachievers who had below-average ability was 26.67 per cent.

Chi square 9. Is the proportion of ABOVE-AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among sixth-grade boys and girls?

Results: There were significantly more sixth-grade students of above-average ability who were underachievers in District R as compared with District A. The significance was beyond the 1 per cent level. The chi square was 16.16, with 1 d.f.

The percentage of District A above-average-ability underachievers in the sixth grade was 17.44 per cent.

The percentage of District R above-average-ability underachievers in the sixth grade was 43.84 per cent.

Chi square 10. Is the proportion of AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among sixth-grade boys and girls?

Results: There was not a significantly greater proportion of sixth-grade students of average ability who were underachievers in District R as compared with District A on this level.

The percentage of District A underachievers of average ability was 34.88 per cent.

The percentage of District R underachievers of average ability was 31.50 per cent.

Chi square 11. Is the proportion of BELOW-AVERAGE underachievers to total underachievers significantly greater in District R as compared with District A among sixth-grade boys and girls?

Results: There is a significantly smaller proportion of the below-average students who are underachievers in District R as compared with District A. The significance was beyond the 1 per cent level. The chi square was 11.97, with 1 d.f.

The percentage of District A underachievers with below-average ability was 47.67 per cent.

The percentage of District R underachievers with below-average ability was 24.65 per cent.

Chi square 12. Are there differences in OVER-ALL patterns of underachievement in both districts among fourth-grade students?

Results: The fourth-grade patterns on the three ability levels of boys and girls were very similar. What over-all differences there were, were not significant. (It has been previously noted, however, that there was a significant difference when District A's above-average fourth-grade boys and girls were singled out and compared with District R's above-average fourth-grade boys and girls; District R was shown to have had the greater proportion in that instance.)

	Fourth-grade Boys			Fourth-grade Girls			
	Above average	Average	Below average	Above average	Average	Below average	
District A							
fo*	3	13	11	1	4	6	38
fe*	(6.6)	(11.3)	(9.7)	(2.3)	(5.0)	(3.1)	
District R							
fo	14	16	14	5	9	2	60
fe	(10.4)	(17.7)	(15.3)	(3.7)	(8.0)	(4.9)	
	17	29	25	6	13	8	98

*fo = frequency observed; fe = frequency expected

	Boys x^2	Girls x^2
Above average		
District A	1.97	.74
District R	1.25	.46
Average		
District A	.26	.20
District R	.16	.13
Below average		
District A	.18	2.71
District R	.11	1.71
	3.93	5.95
	+5.95	

$x^2 = 8.88$ d.f. = 5 Not significant

(15.09 needed at 5 d.f. for 1 per cent level; 11.07 needed for 5 per cent level)

Observe the difference between this fourth-grade data and the sixth-grade data which follow.

Chi square 13. Are there differences in OVER-ALL patterns of underachievement in both districts among sixth-grade students?

Results: The differences in underachievement in District R and District A sixth grades were statistically significant. Comparisons of the three levels of ability among boys and girls of the two districts showed considerable variability.

	Sixth-grade Boys			Sixth-grade Girls			
	Above average	Average	Below average	Above average	Average	Below average	
District A							
fo*	10	19	31	5	11	10	86
fe*	(17.1)	(20.8)	(21.5)	(12.2)	(7.4)	(7.0)	
District R							
fo	36	37	27	28	9	9	146
fe	(28.9)	(35.2)	(36.5)	(20.8)	(12.6)	(12.0)	
	46	56	58	33	20	19	232

*fo = frequency observed; fe = frequency expected

	Boys x^2	Girls x^2
Above average		
District A	2.95	4.25
District R	1.74	2.49
Average		
District A	.15	1.76
District R	.09	1.03
Below average		
District A	4.20	1.29
District R	2.47	.75
	11.60	11.57
	+11.57	
	x^2 = 23.17	Significant beyond 1 per cent level

Discussion. The proportions of the three ability groups of boys and girls in both districts who were underachievers, compared to the total underachievers of each district, showed that the respective groups were not contributing evenly to the number of underachievers in the respective districts. In District A, considerably fewer underachievers came from the above-average group as came from this group in District R. This was true of both sexes and both fourth and sixth grades. (The details are shown in Chi square 12 and 13.) District A had fewer underachievers from the above-average group than the frequency expected, while District R had more than the frequency expected.

The number of observed cases of underachievers can, by the use of a contingency table, be compared with the proportionate number of students that would normally fall into this group under the law of chance. This normal, or expected number, in chi square measurement of significance is known as the "fe" or "frequency expected."

What possible factors could have existed to account for the finding that in District A significantly fewer underachievers came from the above-average group than the frequency expected, while District R had more from this group than expected?

Speculations on this finding:

1. The grouping program for above-average students in District A was effectively operating.

2. The following arguments for such grouping, as listed in the Review of Related Literature, may have had an effect upon their achievement:

a. The reduced range of variation permitted more attention to individual pupils.

b. Competition and challenge were keener, and low standards did not dominate the group.

c. These students were not held back by students of lesser ability and hence performed closer to their level of ability. Students of above-average ability have the potential to move ahead quickly once restrictions are removed and flexibility incorporated.

d. Parents, interested and pleased with the progress being made, gave greater support and encouragement. Nothing is so encouraging as successful experience.

e. Although in District A regular classroom teachers were used, their inexperience with above-average students was not such a limiting factor as with the below-average students, because of the greater potential of the above-average to profit from self-discovery learning and to move ahead with greater independence.

3. In District R the above factors may not have been operating to the same level and extent because of the absence of grouping.

In the average and below average groups of underachievers in each district, the general trend was for the reverse of the above to be true. District R had fewer underachievers from the average and the below-average groups than the frequency expected; while District A, in relation to its total underachievers, had more from these groups than would have been expected.

This seemed to imply that ability grouping for the below-average students in District A was not as successful as may have been expected. This result, <u>per se</u>, is not necessarily an argument against grouping

the below-average students, but it may indicate that there are factors in the administration of the program which need attention. Possible causes for this unexpected finding could lie in:

1. Inadequately prepared teachers, due to lack of training in teaching homogeneously-grouped classes of below-average students. The program was relatively new, and the regular classroom teachers were expected to adjust to this new situation.

2. Failure to have perfected a sequential program of competencies to be learned.

3. Lack of adequate finance to keep these classes small and to provide appropriate teaching materials. If large, they would be apt to contain students who were incorrigibles in addition to the students of below-average ability. These behavioral problem students may have introduced poor peer leadership into the class--a corollary here may have been teacher fatigue. This fatigue could have stemmed from these class behavioral problems--from the teacher attempting to replace personally the normal peer group leadership which was disturbed through the grouping situation--or from the teacher attempting to do an adequate teaching job in a situation for which he had not been trained.

4. If stigma was attached to the lower group, with the consequent lowering of the self-concept of the students, research has shown that this factor is detrimental to achievement.

Magnitude of Underachievement

Part (b) of the second hypothesis stated that there would be no significant difference in the magnitude of underachievement in the two districts surveyed. In the analysis of the data, the number of cases

in each ability level was obtained, then the mean number of months of underachievement below the cutting point was established. Table 4 shows the tabulation of these results.

To determine significance, the differences were tested statistically by use of the "standard error of the difference between means technique."

The following groups were compared and results noted:

The mean of sixth-grade District A boys was compared with the mean of the fourth-grade District A boys. The same comparison was made for sixth-grade girls versus fourth-grade girls. For boys, a *t* of .93 was obtained; for girls, the difference between means was negligible (M 5.6 for the sixth grade, and M 5.8 for the fourth grade), a difference of -.20. In other words, the differences in the magnitude of underachievement between sixth- and fourth-grade students was not significant as far as grade level was concerned.

The next step was to combine grade levels; i.e., sixth-grade and fourth-grade boys and sixth-grade and fourth-grade girls. There were no significant sex differences between boys versus girls when the two grade levels of boys were compared with the two grade levels of girls. (The *t* was .56.)

Similar comparisons were made for District R students, sixth grade versus fourth grade, and combined girls versus combined boys. Again, no significant difference of any kind was found.

Inter-district comparisons were made on each ability level, and also on all groups combined. As can be noted on Table 4, no differences were significant. The *t* was 1.01. All levels of ability comparisons, and total group comparisons showed remarkably similar patterns of achievement.

Table 4. Magnitude of underachievement

	Sixth Grade			Fourth Grade		
	Above average	Average	Below average	Above average	Average	Below average
District A underachievers						
Boys						
Σ months	34	86	294	9	76	64
N	10	19	31	3	13	11
M*	3.40	4.53	9.48	3.00	5.85	5.82
Girls						
Σ months	40	68	56	4	12	35
N	5	11	10	1	4	6
M	8.00	6.18	5.60	4.00	3.00	5.80
District R underachievers						
Boys						
Σ months	161	197	204	38	136	100
N	36	37	27	14	16	14
M	4.47	5.32	7.55	2.71	8.50	7.14
Girls						
Σ months	121	27	82	20	50	15
N	28	9	9	5	9	2
M	4.32	3.00	9.11	4.00	5.55	7.50

	Total Fourth and Sixth Grades			
	Total M	Above average	Average	Below average
Combined M				
District A	6.27	4.58	5.15	7.74
District R	5.59	4.10	5.77	7.71

*Mean number of months below the cutting point selected for determining underachievement.

The above-average students had the least magnitude of underachievement--District A proved to be 4.58 months below the cutting point determined for underachievement; while above-average students in District R averaged 4.10 months, a lesser amount without significance.

Average ability students in District A averaged 5.15 months, and the comparable District R group averaged 5.77 months. It will be noted that the average-ability groups were approximately one month farther from working to their potential capacity than were the students of above-average ability.

The students of below-average ability averaged for District A 7.74 months below the cutting point. The District R below-average group averaged 7.71 months. Both District A and District R students of below-average ability were approximately three months worse off in regard to working to their full potential than the above-average students of both districts, and about two months poorer in this regard than the students of average ability.

The over-all mean for District A was 6.27 months, and 5.59 months for District R--a difference of .68, which was not significant.

Summary and Discussion of Extent of Underachievement and Magnitude

Summary

The test of the first hypothesis; i.e. (a) that there is no significant difference in the number of underachievers nor (b) in the magnitude of underachievement in the two districts, made it necessary to reject the null hypothesis for part (a) and to accept it for part (b). In the comparison of the number of underachievers in District A and District R (see chi square 1), random-grouped District R

had a significantly greater number of underachievers. No significant difference was found in the magnitude of underachievement in the two districts, however.

Because of differences existing in the two districts after the careful equating of groups, it appeared that the fewer number of underachievers in District A was due to the independent variable, ability grouping. In fact, statistical analysis showed the differences to be significant beyond the 1 per cent level of probability.

Other significant results (significant at the 1 per cent level unless otherwise stated) were:

Chi square 2. There were significantly more boys than girls who were underachievers in District A.

Chi square 3. There were significantly more boys than girls who were underachievers in District R.

Chi square 4. There were significantly more sixth- than fourth-grade students who were underachievers in District A.

Chi square 5. There were significantly more sixth- than fourth-grade students who were underachievers in District R.

Chi square 6. In proportion to total underachievers, there were significantly more District R students of above-average ability on the fourth-grade level who were underachievers than there were in District A. This significance was beyond the 5 per cent level, but not significant at the 1 per cent level.

Chi square 7. The proportion of average underachievers to total underachievers on the fourth-grade level in District R versus District A was not significant.

Chi square 8. The proportion of below average underachievers to total underachievers on the fourth-grade level in District R versus District A was not significant.

Chi square 9. The proportion of superior sixth-grade Ogden underachievers to total underachievers was significantly greater in District R than in District A.

Chi square 10. The proportion of average ability sixth-grade underachievers to total underachievers was not significant when District R was compared with District A.

Chi square 11. The proportion of below-average sixth-grade underachievers to total underachievers in District R versus District A was significant beyond the 1 per cent level. In this instance there was a significantly smaller proportion of the below-average students who were underachievers in District R than in District A (the results were in favor of District R).

Chi square 12. When checked by means of a contingency table, no significant differences were found in over-all patterns of underachievement between the fourth grades of the two districts. The patterns of underachievement were very similar in this instance.

Chi square 13. District A and District R sixth-grade underachievers were also checked by means of a contingency table to get an over-all view of the patterns of underachievement. In this instance, there was a difference significant beyond the 1 per cent level, showing that the various ability levels were not contributing evenly to the amount of underachievement--with the above-average boys and girls contributing most to the chi square value; the below-average were next in effect; while the average students contributed but very little to the total chi square value.

Among District A students of above-average ability, there were considerably fewer students classed as underachievers than might have been expected. This was true of both boys and girls. There were considerably more District R students in this area than the frequency expected.

The average groups showed only small differences.

Among District A below-average boys and girls, there were approximately one-third more underachievers than might have been expected, while the reverse was true for District R. District R had approximately one-third fewer underachievers in their below-average groups than might have been expected.

Discussion of number of underachievers

While the general indication is that there are fewer underachievers in an ability-grouped system than in a random-grouped system, the results of chi square 13 seemed to indicate that the value of ability grouping as practiced in this study is not equal at all levels of ability. The results do indicate that homogeneous grouping is undesirable or of questionable value for students of average or below-average ability, while being desirable for above-average students--as far as achievement is concerned.

The real gains in achievement in District A were made through grouping the above-average students, and not by grouping the students of average or below-average ability. The achievement gains of the above-average students were so great that when the total District A group was compared with the total District R group, the District A results were colored to a point that grouping seemed generally

desirable. This view, that grouping is equally desirable at all levels of ability, did not bear up under the closer scrutiny given, and cannot be substantiated by the results of this phase of the study.

This same aspect of grouping is also being studied in the four-year research under the direction of Dr. Walter R. Borg, of the Utah State University. It will be recalled that the present study is a phase of this four-year research plan.

Discussion of magnitude of underachievement

Since the over-all mean of underachievement for District A was 6.27 months below the cutting point, and the District R mean of underachievement was 5.59 months below--a difference of only .68 months--it would appear that the magnitude of underachievement in the two districts was about the same, with regard to the depth of underachievement. The point to be considered here, of course, is not the number of underachievers in one district as compared with the other, but rather (of those who have been classed as underachievers) how many months of underachievement do they show? Do the underachievers of one district barely come under the cutting point, while the other district has most of its students many months below the cutting point?

The differences in this degree, seriousness, or magnitude of underachievement, measured in months, were shown to be negligible.

Study Habits

The third hypothesis was stated as, "Underachievers do not have significantly inferior study habits as compared with normal achievers." The research design and the number of cases used to study this hypothesis were given in the Procedure section. The comparisons made

and results obtained are presented in Table 5.

To test this hypothesis, the California Study Methods Survey for grades seven to thirteen was employed. The purpose was to determine significant differences, if any, in the study habits of underachievers as compared to normal achievers. The combination score (or total score)--comprising attitudes toward school, mechanics of study, and planning and system--was used for statistical analysis.

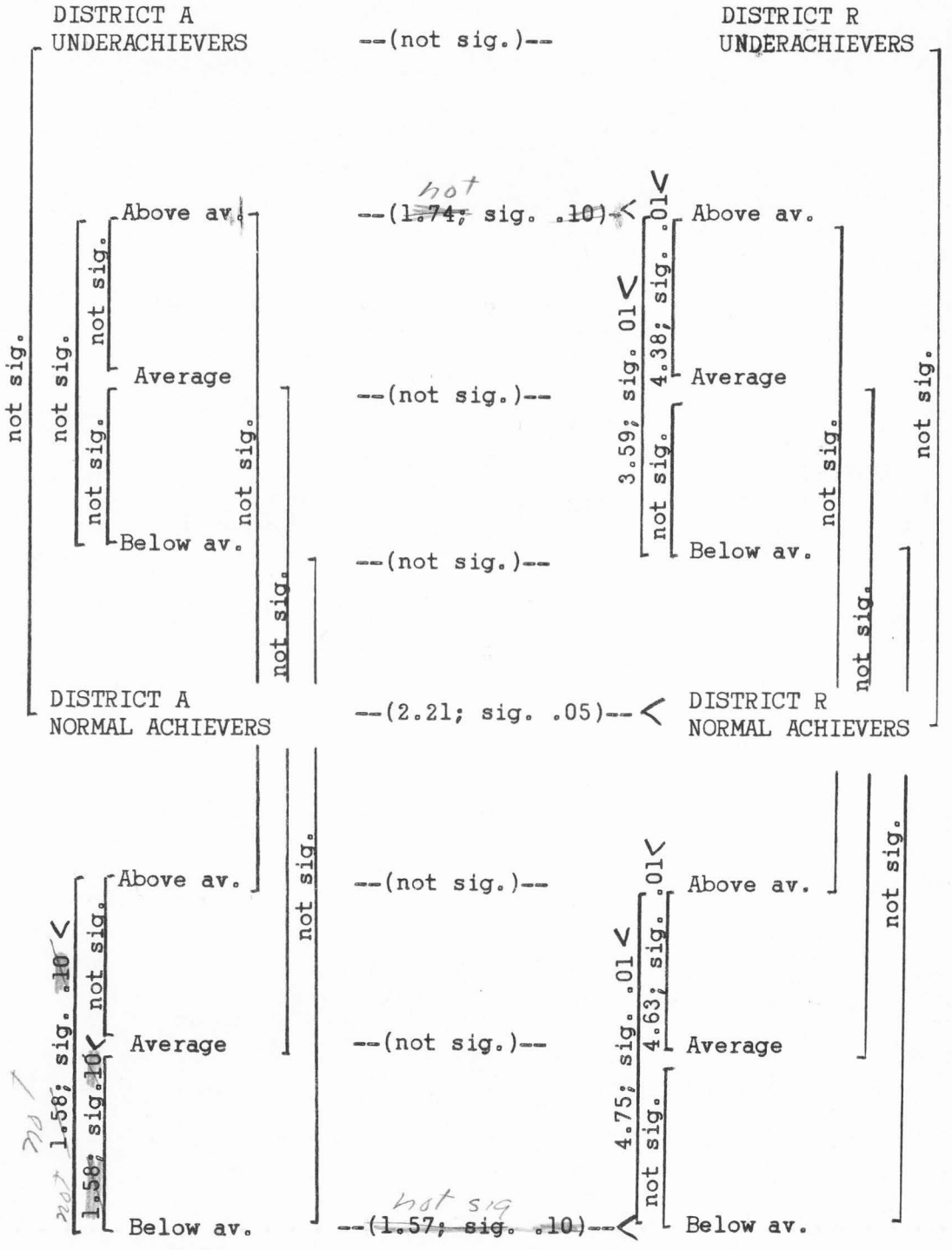
The first comparisons made were to determine whether sex differences occurred between comparable groups within each district. No significant differences were found between boys and girls in comparable groups in the District A sample. Likewise, there were no significant differences between study methods of boys versus girls of comparable ability among District R's underachievers. However, in District R's control group of normal achievers, significant differences at the 1 per cent level, in favor of the girls, were found between boys of high ability and girls of high ability. The t was 3.25.

Between normal-achieving District R boys and girls of below-average ability, the difference was significant at the 5 per cent level ($t = 2.04$), again indicating that the girls had better study habits than comparable boys. There were no important differences related to sex in study habits between normal achieving boys versus normal achieving girls of average ability.

Having found so few differences between boys versus girls that might be related to study methods, it was decided to combine boys and girls in comparable groups; i.e., District A boys and girls of better-than-average ability, District R boys and girls of better-than-average ability, etc. After combining the data for the sexes, study methods were

Figure

Table 5. Comparisons and results of the California Study Methods Survey



compared on the intra-district and inter-district levels. When all three levels of ability were combined, there were no significant differences between:

1. District A underachievers versus District A normal achievers.

2. District R underachievers versus District R normal achievers.

3. District A underachievers versus District R underachievers.

A difference significant at the 5 per cent level was found in favor of District R between:

1. District R normal achievers versus District A normal achievers. The t was 2.21. These results are summarized in Table 5 on the preceding page.

No significant differences were found in study methods for District A's underachievers on the following levels:

1. Students of above-average ability versus students of average ability.

2. Students of above-average ability versus students of below-average ability.

3. Students of average ability versus students of below-average ability.

Among District A's normal achievers, the same levels were compared, and again no significant differences were found, but two differences approached significance, as shown in the table. These differences were between above-average students versus below-average students and students of average ability versus students of below-average ability. Both differences approached significance at the 5 per cent level ($t = 1.58$).

Study method differences for total District A's underachievers versus District A's total normal achievers showed no significance between the various levels of ability.

Among District R's underachievers, comparisons were made with significances found between two out of the three levels of underachievement. Above-average versus average yielded a t of 4.38, in favor of the above-average group. Above-average underachievers were also superior in study habits to below-average underachievers (t = 3.59).

Two out of three groups of District R's normal achievers showed significant differences: District R boys and girls of above-average ability were significantly higher than District R boys and girls of average ability (t = 4.63). District R boys and girls of above-average ability were also better in study habits than District R boys and girls of below-average ability, with a t of 4.75.

District R's underachievers versus District R's normal achievers showed no significant differences on any of the three ability levels.

The comparison of study habit patterns between ability-grouped and random-grouped pupils (District A versus District R) gave no significant results on any of the three ability levels, although two groups approached significance at the 5 per cent level (see Table 5, page 147).

From the findings cited, it appears that for the sample used in this study, the null hypothesis will have to be accepted. It did not appear that study methods played a major role in underachievement.

Discussion

The finding here was not to have found significant differences between the study habits of underachievers versus normal achievers at any level of ability in either district. Since the findings do not support the idea that normal achievers have better study habits than underachievers, the causes of underachievement must lie in other areas.

A related area for further investigation could be within the sub-scores of the California Study Methods Survey. This test, it will be recalled, has three sub-scores, but the total score alone was used in the statistical analysis made. No attempt was made to use these sub-scores separately for comparisons, although to do so may have given additional information on the subject. Which of the three elements--(1) attitudes toward school, (2) mechanics of study, or (3) planning and system--contributed most heavily to the total score? Was the pattern the same in the two districts? These are questions that at present lie unanswered.

Normal achievers, it appears, have somehow learned how to think, how to generalize, and how to solve problems. Perhaps they have more insight into organizing perceived situations into concepts of broader value.

In comparing the ability levels within each district, a trend can be observed which is worth noting. Among both districts' normal achievers and Ogden's underachievers, the students of better ability had better study habits. Perhaps because of their superior brain power they may be able to see better ways of using their time to best advantage. They may have more drive and purpose than other students, and may likely have

a longer attention span--hence the tendency to better study habits.

For District A's underachievers on these same levels of ability, this was not the case; here no inter-ability-level significant differences were noted. How can this be accounted for? Does the factor of greater homogeneity in the grouped situation tend to lessen the need or motivation to organize good study habits? Or may we conjecture that the underachievers of all three levels of ability in the grouped situation reflect a common type of behavior pattern wherein there is a need for better attitudes, values, ideals of procedure, mechanics of study, and study methods? It is interesting to speculate on the groups and/or levels where study methods appeared to be important. However, there seemed to be no consistent pattern. Some of these statistically significant differences could be attributed to chance, and it would be difficult to state the exact reason for these differences with any degree of validity.

Emotional Disturbance

The fourth hypothesis was stated as, "There is no significant difference between the amount of emotional disturbance in normal achievers as compared with underachievers." To test this hypothesis, the "Thinking About Yourself" test, a process developed in the California State Department of Education for early identification of emotionally disturbed children, was used. The same sample was used as on the previous work on study habits.

The first comparisons were made to determine whether significant sex differences occurred between comparable groups within each district, or between districts. No significant sex differences in the amount of

emotional disturbance were found in either District A or in District R, nor between the two districts.

The next step was to combine boys and girls in comparable groups. To provide an over-all picture, the first comparisons made after combining groups of boys and girls was to combine the three ability levels in each sample. These total groups were compared for significant differences. See Table 6.

Total group comparisons

The following comparisons were made and results noted:

1. District A underachievers versus District A normal achievers showed a t of 1.66, which was significant at the 10 per cent level, with the greater amount of emotional disturbance among the normal group.

2. District R underachievers versus District R normal achievers showed a t of 1.24, which was not significant, with the normal group again having the greater amount of disturbance.

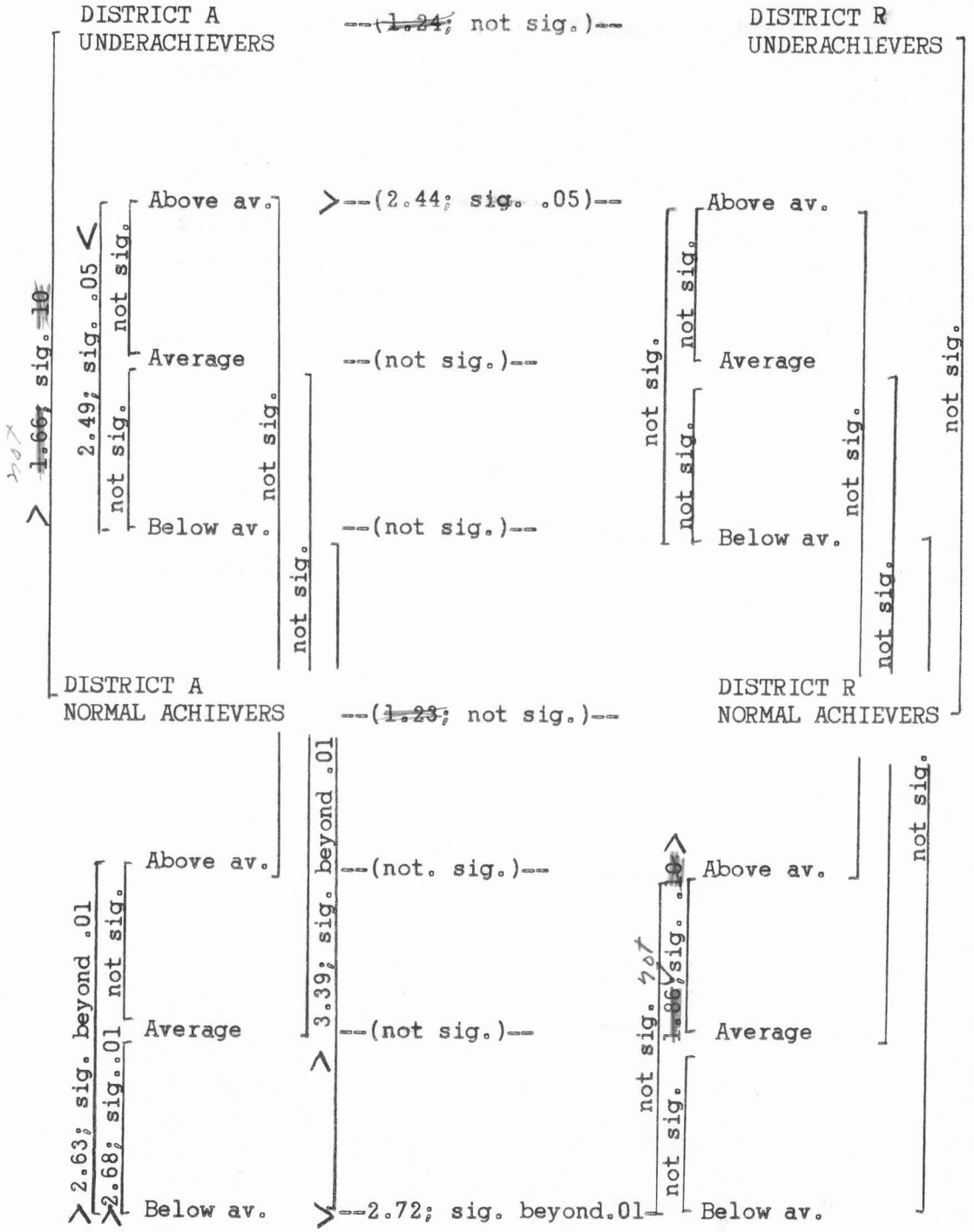
3. District A underachievers versus District R underachievers showed a t of 1.24, which was not significant; the greater amount was in the District A sample.

4. District A normal achievers versus District R normal achievers showed a t of 1.23, which was not significant, with the greater amount again found in the District A sample.

Although these groups did not show significant differences at the 1 nor 5 per cent level, it was noted that the normal groups, when compared with the underachievers, tended to show more disturbance. Also, District A groups tended to have a greater amount of disturbance than the District R groups.

Figure

Table 6. Comparisons and results of the "Thinking About Yourself" test



Sub-group comparisons

Comparisons of sub-groups (ability levels) within each district produced the following results:

Among District A underachievers, a comparison of the above-average with the average group was not significant. The comparison of the above-average with the below-average group showed a *t* of 2.49, which was significant at the 5 per cent level, with the greater amount of emotional disturbance among the underachieving students of the above-average potential. A comparison of the average group with the below-average group was not significant.

Among District A normal achievers, a comparison of the above-average versus the average group was not significant. The comparison of the above-average group with the below-average group yielded a *t* of 2.63, which was significant at the 1 per cent level, with the greater amount of emotional disturbance in the below-average group. In the comparison of the average group with the below-average group, a *t* of 2.68 was found, which was significant at the 1 per cent level, and again the greater amount of emotional disturbance was found in the below-average group.

In comparing District A underachievers with District A normal achievers, the above-average underachievers versus the above-average normal achievers comparison was not significant. The comparison of average underachievers with average normal achievers was not significant. The below-average underachievers versus the below-average normal achievers comparison yielded a *t* of 3.39, which was significant beyond the 1 per cent level. The below-average normal-achieving group showed more emotional disturbance.

In comparisons of District R underachievers, the above-average comparison with the average group was not significant. The above-average group compared with the below-average group and the average group compared with the below-average group showed no significant differences either.

Among District R normal achievers, a comparison of above-average with average students of the sample yielded a t of 1.86, which was significant at the 10 per cent level. The average students had more emotional disturbance than the above-average. The comparisons of the above-average with the below-average group and the average with the below-average group yielded nothing of significance.

In comparing District R underachievers with District R normal achievers, none of the comparisons (above-average underachievers versus above-average normal achievers, average underachievers versus average normal achievers, and below-average underachievers versus below-average normal achievers) proved to be significant.

Comparisons of inter-district sub-groups (ability levels) produced the following results:

In comparing District A underachievers with District R underachievers, the comparison of the above-average groups yielded a t of 2.44, which is significant at the 5 per cent level. The District A underachievers had the greater emotional disturbance. The comparisons of the average groups and the below-average groups were not significant.

In comparing District A normal achievers with District R normal achievers, the comparison of above-average groups and average groups yielded nothing of significance, but the comparison of below-average groups yielded a t of 2.72, which was significant beyond the 1 per cent

level. The District A normal achievers showed greater emotional disturbance.

From the foregoing sub-group comparisons, it is evident that in two instances the District A students tended to have more emotional disturbance than did the District R students.

Summary

In comparing total District A groups with total District R groups, as far as emotional disturbance being a factor in underachievement was concerned, no significant differences were found. However, in comparing District A underachievers with District A normal achievers for this factor, the normal achievers were found to have a greater amount of emotional disturbance. The t was 1.66, which is significant at the 10 per cent level.

In comparing the sub-groups within each district, significant differences were found in District A among the following ability levels: underachievers, above-average versus below-average--the greater amount of emotional disturbance was found among the underachieving students of above-average potential ($t = 2.49$, significant at the 5 per cent level); normal achievers, above-average versus below-average--the greater amount of emotional disturbance was in the below-average group ($t = 2.63$, significant at the 1 per cent level). Normal achievers, average group versus below-average--the greater amount of emotional disturbance was found in the below-average group ($t = 2.68$, significant at the 1 per cent level); underachievers versus normal achievers, below-average groups--the below-average normal-achieving group showed more emotional disturbance than the average group ($t = 3.39$, significant beyond the

1 per cent level.

Significant differences were found in District R between the following ability levels: normal achievers, above-average versus average group--the average students had more emotional disturbance than the above-average group ($t = 1.86$, significant at the 10 per cent level).

In comparing inter-district sub-groups, significant differences were found between the following ability levels:

District A with District R underachievers, comparison of above-average groups--the District A underachievers showed the greater emotional disturbance ($t = 2.44$, significant at the 5 per cent level).

District A normal achievers versus District R normal achievers, comparison of below-average groups--the District A normal achievers showed a greater emotional disturbance than those of the District R group ($t = 2.72$, significant at the 1 per cent level).

Discussion

Several questions immediately arise in regard to these findings:

1. Are these differences in degree of emotional disturbance due to the experimental variable (ability grouping)?

2. Are these differences desirable or undesirable?

3. Would follow-up studies on mental health be advisable?

4. Do the findings reflect superior motivation on the part of the District A students? (The measure used for emotional disturbance is based on the concept of the difference between "self" and "wanted self.")

In answer to the first question, it appears probable that grouping does influence children's feelings concerning their "wanted self" as

compared with "self." Attention is called to District A's above-average underachievers. The reader has noted that this group tended to have more emotional disturbance than the comparable sample in a non-grouped situation. Also, this group showed more disturbance than the District A below-average underachievers. Being of above-average potential, and realizing their underachievement, these students would naturally be concerned about their status. Sears (1940) states the converse of this situation. Students whose goals continue to be reached find success gratifying and the sequence tends to become self-perpetuating. Also, see Goldberg (1959) (Review of Related Literature section, page 40).

One might ask why (if they are concerned) do they not pull out of this underachievement situation. Perhaps they will; but underachievement is seen by most students of the problem as being a long-term phenomenon. Its origin probably lies to a great degree in early childhood where many factors interplay. It is thought that failure to develop the habit or ability to generalize perceptions into larger and broader concepts has a lot to do with a child's development. The influence of the home and environment are part of the picture. The many influences might be compared to the many ingredients that go into a cake--they are individual entities to start with, but it is difficult to isolate them after the baking has taken place. Thus, the factors which could influence their achievement have become molded into the total personality structure of the child and it is unlikely that a student aware of his status would find it easy to make adjustments in his learning behavior. Finding it difficult to measure up to his "wanted self" leaves him emotionally disturbed.

The students of lesser ability in the underachieving group are perhaps not so aware of the problem and as yet may not have become concerned about their underachievement--hence the lack of emotional disturbance. The discrepancy between "self" and "wanted self" is minimal.

A look at the opposite end of the picture in District A tends to confirm these ideas. It has been noted that among the normal achievers of below-average ability we find enough emotional disturbance to be significant beyond the 1 per cent level when the above-average and average are compared with the below-average groups. These students are in an ability-grouped situation. They are achieving up to the level of their capacity, but not without some concern and emotional disturbance. They are aware of the grouping situation. Their opportunity to move upward to the average group depends in District A upon their achievement and not upon their I.Q.--hence their drive for advancement.

Note also that when the District A below-average underachievers were compared with the below-average normal achievers, the greater emotional disturbance was found in the normal group. This was as would be expected because of the reasons previously discussed. Many of the underachievers of below-average ability have not yet established a felt-need to change their position.

It should also be observed here that the same factors appear to be operating between District R's and District A's below-average normal achieving students, where District A again had the greater amount of emotional disturbance. In the opinion of the investigator, the grouping program is related to these observations.

The second question posed asked if this greater amount of emotional disturbance at certain of District A's ability levels is desirable or undesirable. It may be related to motivation. When it comes to a question of how much "stirring up" is good for students, the problem can perhaps best be answered on an individual basis. Much is said about the individual differences of students and adjusting teaching to these differences. It seems that here, too, differentiation of teaching is the primary factor to be observed, and teachers in either of the two situations would do well to place their allegiance to the child rather than to the grouping or non-grouping plan.

In the above area there is need for much more research, which answers the third question.

The fourth question asked if these results reflect superior motivation on the part of the District A groups where significant differences existed. It should be noted that, for the most part, no significant differences were found. However, between a few ability-level groups, as observed, the differences were significant beyond the 1 per cent level. It seems logical to believe that teacher- or district-philosophy-induced motivation would be more universally present and not this spotty. Good motivation is generally considered to be intrinsic rather than extrinsic, and this could scarcely be deduced from the data. Furthermore, motivation needs to be in accordance with the type of subject matter being taught. Quick responses to relatively easy materials are sometimes helped by a degree of anxiety. On the other hand, lessons that require insight and problem-solving are best served by a mild type of motivation with the subject matter presented in such a way as to promote discovery and insight with resultant intrinsic motivation in the subject matter itself.

There is the possibility of superior motivation in District A, and likewise there is the possibility of harm being done if the motivation (or emotional disturbance) is excessive. This question cannot be answered conclusively on the basis of the data available.

The motivational factor, however, does not seem to be related to the problem discussed in relation to the hypothesis regarding number of underachievers and magnitude of underachievement and the related discussion on Chi square 12 and 13, page 125 and page 136. It will be recalled that the below-average District A underachievers were contributing more than their expected proportion to the total underachievers in the district. This would not seem to indicate superior motivation upon the part of the below-average District A underachievers.

In general, it is the opinion of the investigator that the emotional disturbance factor is not a primary factor in the significantly fewer numbers of underachievers in District A, although it may have some relationship if it has become a mild motivational factor.

Achievement Motives

The fifth hypothesis stated that underachievers, as compared with normal achievers, do not show a significantly smaller amount of achievement motives. To test this hypothesis, cards 1, 2, 4, and 16 of the TAT test were administered for the purpose of determining whether significant differences existed between the groups in the study in relation to achievement motives. The scoring system was that of Atkinson (1958). The primary assumption that lies behind this projective test is that in completing an unstructured situation, the individual may reveal his own strivings, dispositions, and conflicts.

The first comparisons were made to determine whether significant sex differences occurred between comparable groups, as was done with the other measures used. Again, no significant sex differences in the magnitude of achievement motives were found in any of the groups or samples.

Total group comparisons

No sex differences being found, the next step was to combine boys and girls in comparable groups. To gain a total picture, the three ability levels in each sample were also combined. These total groups were analyzed for significant differences and no significant differences were found within or between districts. The results are shown in Table 7.

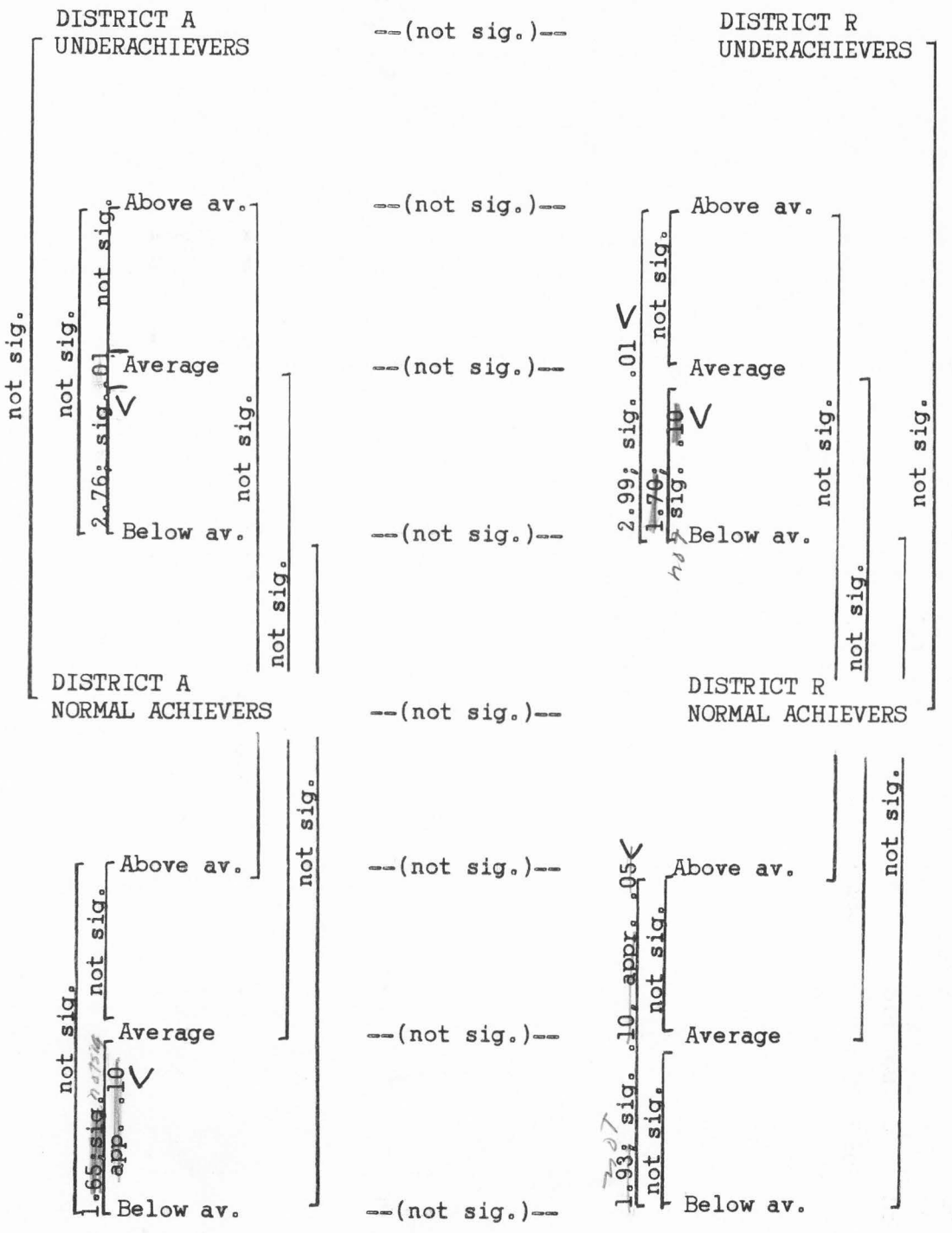
Sub-group comparisons

Comparisons of intra-district levels of achievement and ability gave the following findings:

Among the District A underachievers, comparisons of the above-average versus the average groups and the above-average versus the below-average groups yielded no significant differences. The average group versus the below-average group yielded a t to 2.76, however, which was significant at the 1 per cent level. The average group showed more achievement motives.

Among the District A normal sample, none of the ability level comparisons were significant, but that of the average group compared with the below-average group approached significance at the 10 per cent level with a t of 1.65.

Table 7. Comparisons and results of the TAT (Achievement Motives) test



In comparing District A underachievers with District A normal achievers, none of the ability level comparisons proved significant.

Among the District R underachievers, the above-average group compared with the average group showed no significant difference. The above-average group had more achievement motives when compared with the below-average group, however (t of 2.99, significant beyond the 1 per cent level). The average group also had more achievement motives when compared with the below-average group (t of 1.70, significant at the 10 per cent level).

Among the District R normal sample, the comparisons of above-average versus average and average versus below-average groups were not significant, but the above-average group had more achievement motives when compared with the below-average group (t of 1.93, significant at the 10 per cent level, approached significance at the 5 per cent level).

None of the ability level comparisons of District R underachievers versus District R normal achievers showed significance.

Inter-district sub-group (ability level) comparisons

None of the ability-level comparisons of District A underachievers versus District R underachievers or District A normal achievers versus District R normal achievers proved significant.

Discussion

The observation that can be made here is that the significant differences in the amount of achievement motives are not between

districts--neither in the toal group, nor in the sub-groups.

Neither are there significant differences between underachievers and normal achievers within each district--either total group or between comparable ability levels of underachievers and normal achievers.

An interesting finding, however, is the fact that between the various levels of ability, significant differences were found in both districts--with the students of better ability (average and above average) showing more achievement motives than the students of lower ability.

Three out of the four main divisions (all but District R's average normal achievers) showed a tendency for the average students to have more achievement motives than the below-average groups.

Only one group out of the four main groups showed above-average students who had significantly more achievement motives than the average or below average. Speaking generally, then, the trend is for the average students, not the above-average students nor the below-average groups, to show more achievement motives. None of the significant findings were in favor of the below-average students.

Atkinson and Redlich (1958, pp. 85 and 395) by use of an Index of Social Position, developed five classes into which members of society might be grouped. A more detailed treatment of this index will be given later in the discussion of the data related to socio-economic conditions and underachievement. The point which seems to help explain the findings on achievement motives is that the middle groups, Class II and Class III particularly, are the keenly status-conscious groups. They are the groups that associate closely enough with the upper class, Class I, to be aware of the advantages in this "arrived" group. They are described as being

socially "upward mobile" people. It is this group which gives strong support to the schools. The people want the best, but can't afford it. They make strong efforts to move up and get ahead. In Class IV, at least 71 per cent of the class were stable and not making sacrifices to get ahead. In the lowest group, Class V, 45 per cent of the class were inured to hardship; many were hopeful, but resigned to their position.

We may speculate here and draw an analogy. It appears logical to suppose that the students of above-average ability may tend to be somewhat complacent, knowing that they are achieving--or believing that they could be on top if they so desired. The middle group, ability-wise, could be compared to Atkinson's Class II and III which are the keenly status-conscious groups which are striving most to achieve. The below-average students might be compared with Class IV and V, of which many are inured or resigned to their positions. We may also speculate that in this group of lower I.Q. students, the ways and means of achieving goals and their attending benefits have not been so thoroughly felt and understood.

Home Conditions

The sixth hypothesis stated, "No significant difference exists between home conditions, including the socio-economic aspect and the parents' attitudes toward school, of underachievers as compared with normal achievers. To examine the two aspects of this hypothesis (socio-economic conditions and parents' attitudes toward school), individual, private interviews with each student were used to obtain the necessary information.

The socio-economic aspect

The student was asked questions concerning the occupation of the chief wage-earner of the family and his education. The response to each question was given a position from 1 to 7 on the Hollingshead Occupation Scale and Education Scale. From these weighted scales, an index of social position score (Hollingshead, 1958), with modification as explained in the Procedure section, was used to arrive at a class-status position. The position of each class in the social structure was designated by a Roman numeral. The highest was Class I and the lowest, Class V.

The modified Hollingshead Family Index of Social Position comprised the following five classes:

Class I. Persons from old, commonly recognized, pace-setting families; executives; and professional men

Class II. Lesser executives and professional men; status-sensitive people who want the best, but can't afford it

Class III. Persons who follow semi-professional and technical pursuits

Class IV. Skilled manual employees; the stable working class

Class V. Semi-skilled and unskilled workers

After tabulating the number of cases and mean index of social position for boys and girls of each ability level in both districts, the results were compared by use of the standard error of the difference between means.

Out of six comparisons made, there were no significant sex differences in the District A sample, with the exception of one group--underachieving average boys versus underachieving average girls. The t of 2.31 here was in favor of the boys and was significant at the 5

per cent level (a t of 2.11 being needed, with 17 d. f.). Similarly, in District R, six comparisons were made, and no significant sex differences were found that pertained to the index of social position. The data for boys and girls were therefore combined.

District A intra-district comparisons, after combining sex groups, showed significant differences for two of the three groups of underachievers. There were no significant differences for any of the three levels of normal achievers; i.e., above-average versus average, above-average versus below-average, and average versus below-average.

In District A, the above-average when compared with the below-average yielded a t of 2.71 in favor of the above-average where better socio-economic conditions were found, which is significant beyond the 2 per cent level (a t of 2.77 is needed for significance at the 1 per cent level, with 27 d. f.). Too, the average compared with the below-average yielded a t of 1.85 in favor of the average, which is significant at the 10 per cent level with 32 d. f.

District A underachievers, when compared with District A normal achievers showed no significant findings.

District R intra-district comparisons were made with the following results: District R above-average underachievers compared with average underachievers showed no significant difference. Above-average students versus below-average students for the socio-economic factor showed significance at the 5 per cent level, with a t of 2.03 in favor of the above-average students, with 34 d.f. Average versus below-average was not significant at 35 d.f.

District R's normal achievers all showed the relationship of the socio-economic factor to achievement.

The above-average District R normal achieving students were compared with the average normal-achieving students, and a t of 2.70 in favor of the above-average student was obtained, which approaches significance at the 1 per cent level. It is significant at the 2 per cent level with 32 d.f.

The above-average District R normal-achieving students, when compared with District R's below-average achieving students, produced a highly significant t (4.65) in favor of the above-average students. This is significant far beyond the 1 per cent level, with 34 d.f.

Average versus below-average was also significant at the 5 per cent level, with a t of 2.05 and 35 d.f., in favor of the average students.

Further District R intra-district comparisons of underachievers versus normal achievers showed no significant difference on any level of ability.

When total districts were compared (all District R versus all District A students), no significant differences were found for either underachievers or normal achievers. In other words, there were no over-all significant differences in socio-economic conditions between District R and District A.

Summary

It has been noted that some significant socio-economic relationships existed between students of various ability levels on an intra-district basis, both in District A and in District R. The relationship was in favor of the homes with the higher standards, or indexes of social position; less underachievement was found among students from these homes.

There were no over-all significant differences in the inter-district comparisons for this factor, which gives strength to the major hypothesis regarding significant differences in the number of underachievers and magnitude of underachievement, for it shows the careful equating of the two groups except for the ability grouping factor.

Parents' attitudes toward school

The attitude of parents toward school and its reflection in the home through provision of appropriate measures and places for study constituted the second part of the sixth hypothesis.

The data to test this area were gathered during a personal interview with the students by the researcher. The sample from District A was composed of 46 underachievers and 41 normal achievers. There were 53 and 52 students in the same categories from the District R sample, respectively.

The data were derived from questions asked orally, such as: "Do your parents want you to attend college?" "Do you have a quiet, well-lighted place at home where you can study?" "Do your parents encourage you to study regularly at home?" and "Do your parents frequently give you praise or encouragement for your school work?"

Each item was given a score of 1, which made possible a range of from 0 to 4. Zero equalled no parental support, through a continuum up to a maximum of 4--the highest parental support.

The mean was obtained for each group, and differences between means were tested for significance by the "standard error of differences between mean" technique.

Total group comparisons

The means for parents' attitudes toward school and home conditions were determined for students on all levels of ability. This information was combined so that total group comparisons of means could be made.

No significant difference was found when total District A underachievers were compared with total District A normal achievers.

Similar procedures and comparisons in the District R sample likewise showed no significant difference between District R underachievers and District R normal achievers.

These two tests show that intra-district home conditions and parents' attitudes toward school did not vary enough in the homes of underachievers as compared to normal achievers to be a significant factor in underachievement. It was interesting to note, however, that inter-district comparisons produced some significant findings.

Total District A underachievers when compared with total District R underachievers yielded a t of 1.71, significant at the 10 per cent level, with 98 d.f. This was in favor of the District R home conditions. The t of 2.07 was significant at the 5 per cent level with 92 d.f.

No comparisons of sub-groups of any kind produced significant results except District A below-average normal achievers versus District R below-average normal achievers. This was one positive comparison out of 24 possible comparisons which might have yielded significant differences. The results here produced a t of 1.70, which is significant at the 10 per cent level, with 30 d.f. The better home conditions for

study were in favor of the District A parents in this single instance.

Summary

Parents' attitudes toward school and home conditions, as measured by the questions used by the researcher, did not appear to be primary contributors to underachievement in either of the two districts, as no significant differences were found between underachievers and normal achievers in either district. In fact, the means between underachievers and normal achievers in each case were nearly identical. District A underachievers had an M of 3.41, and the M of normal achievers was 3.44. In District R, the means were 3.73 and 3.70, respectively.

There were slightly better home conditions and parents' attitudes toward school in District R than in District A, significant at low levels of probability--5 and 10 per cent.

Health

Hypothesis No. 7 was stated as: "There is no significant difference in the health of underachievers as compared with normal achievers."

To test this hypothesis, a total of 178 students were given thorough medical check-ups by a competent practicing pediatrician. From District A, 87 students were chosen on a stratified-random basis from all three ability levels. The District R group was selected in a similar manner and comprised 91 cases.

The selection of probable health-related causes of underachievement was reviewed by the supervisor of the health department serving the

respective districts, the medical doctor in charge of this health department, and by the practicing physician who gave the medical check-ups.

Parents and students were very cooperative in this study.

Prior to the physical examinations, complete case histories were obtained on each student by the nurses of the health department serving the districts, under the direction of their supervisor. Major items reported in the case histories were: normal or abnormal delivery and development; communicable disease history and complications; health habits, including rest, food, and sleeping practices; observed listlessness or lack of vitality; allergies; operations; speech, hearing and vision; chronic diseases of all types; treatment of ailments; traumatic emotional experiences; normal sexual development; epilepsy; surgery; and any other information which the parents wished to divulge. Incidentally, this data was used by the nurses later in follow-up services.

The health examination itself covered the items shown in Table 8, plus written observations by the doctor wherever abnormalities were present. The nurses again assisted with these examinations, and each report was dated and signed by the physician.

In the statistical analysis of the data, only those students who had three or more health problems were classified as having health problems. Those with two or fewer health problems were classified as having no health problem. Roughly 1.3 sigma, or 74 per cent of the students were classed as normal, having either no health problems whatsoever, or not more than two health problems. This is, admittedly, an artificial dichotomy and was employed as a means of testing the

Table 8. Tabulation of health data

Health problem	Number of Cases: District A Achievers Under	District A Achievers Normal	District R Achievers Under	District R Achievers Normal	Totals	Per cent
Urine	13	11	9	3	36	20.0
Hemaglobin					-	-
Blood pressure					-	-
Eyesight	11	10	13	5	39	22.0
Height	18	12	13	13	56	31.0
Weight	23	14	16	17	70	39.0
Ears	1	2			3	2.0
Nose	1	1			2	1.0
Throat	3	1			4	2.0
Lungs					-	-
Heart		1		1	2	1.0
Abdomen					-	-
Hernia		1			1	.5
Extremities	3	1	3		7	4.0
Case history complications	13	10	7	5	35	20.0
Pubertal changes	5	3		1	9	5.0
Orthodontic (braces)			2		2	1.0
Acne, eczema or other scars, blemishes, or obvious defects	4	9	5	9	27	15.0
Total sample	87		91		178	100.0

statistical significance of the data by chi square.

When all ability levels were combined and tested, no significant differences were found in the analysis of the following questions:

Do District A underachieving boys have significantly more health problems than District A underachieving girls?

Do District A normal achieving boys have significantly more health problems than District A normal achieving girls (all ability levels combined)?

Do District R underachieving boys have significantly more health problems than District R underachieving girls?

Do District R normal achieving boys have significantly more health problems than District R normal achieving girls?

Do District A underachieving students have significantly more health problems than District A normal achieving students?

Do District R underachievers have significantly more health problems than District R normal achievers?

Do District A underachievers have significantly more health problems than District R underachievers?

Do District A normal achievers have significantly more health problems than District R normal achievers?

Summary and conclusions

Again, it is interesting to note that no significant differences were found between any of the above groups.

It must be concluded that in this particular Western area the average student's health is good enough that poor health cannot be considered as a primary factor in the underachievement of students.

Table 8, on the previous page, shows the major areas where difficulties occurred. It will be noted that over-weight was the most common health problem. This agrees with the data of President Kennedy's Physical Fitness Program, in which it is reported that one of every three American school children are over-weight.

SUMMARY, FINDINGS, AND CONCLUSIONS

Summary

This study was a phase of the four-year research project in ability grouping being conducted at the Utah State University through a grant from the United States Office of Education.

Purpose of the study

The purpose of the study was to gain additional information concerning the causes and nature of underachievement among upper-elementary and junior high school students. A second purpose was to determine, if possible the effect of ability grouping upon underachievement.

Two comparable, adjacent northern Utah school districts provided 1,468 students for the samples. In many ways the situation was ideal, because ability grouping was being practiced by one district and not by the other. The fact that experimental and control situations were so readily available was no doubt one of the reasons the study was accepted by the United States Office of Education.

Grouping seemed to offer educators so many possibilities for meeting the individual differences in students' abilities, and yet there was so much criticism of it (usually on ground other than academic achievement), that it was felt that there was need for additional research in this area.

Statement of the problem

This study investigated the causes and the amount of underachievement at the upper-elementary and seventh-grade level in two Utah school districts. Particular attention was paid to the factors which were hypothesized as being responsible for underachievement. A phase of the study was devoted to ability grouping and its effect, if any, upon the amount of underachievement in District A, where ability grouping was practiced, as compared with District R, which served as a control.

All hypotheses were stated in the null form and tested for differences within each district and between districts. The hypotheses were:

1. There are no significant differences related to sex between boys and girls in regard to the following hypotheses.

2. There is no significant difference in (a) the number of underachievers, nor (b) in the magnitude of underachievement in the two districts surveyed.

3. Underachievers do not have significantly inferior study habits as compared with normal achievers.

4. There is no significant difference between the amount of emotional disturbance in normal achievers as compared with underachievers.

5. Underachievers, as compared with normal achievers, do not show a significantly smaller amount of achievement motives.

6. No significant difference exists between home conditions, including the socio-economic aspect and the parents' attitudes toward

school, of underachievers as compared with normal achievers.

7. There is no significant difference in the health of underachievers as compared with normal achievers.

Procedure

Data from the language section of the California Short-Form Test of Mental Maturity and from the battery scores of the California Achievement Test on 676 elementary students from District A and 792 students from District B, grades four and six, were used to determine the number of underachievers from each district and the magnitude of underachievement, if any. The period of time covered was from October, 1958, through May, 1960.

The student's expected education age was determined by using the formula $\frac{2MA + 1CA}{3} = XA$ (two times the mental age, plus one times the chronological age, divided by three). His expected education age (XA) was then compared with his education age as determined by his corrected California Achievement Test score.

A student whose corrected education age was seven or more months below his expected education age was classed as an underachiever.

Measures used

Hypothesis	Measure	Purpose
	California Short-Form Test of Mental Maturity	Used in the identification of underachievers.
1	(No special measure was used to determine sex differences relating to achievement, but all groups were statistically analyzed to see if significant differences existed.)	

Hypothesis	Measure	Purpose
2	California Achievement Test	Used to obtain data on subject-matter gains for comparing groups and districts.
3	California Study-Methods Survey	Used to obtain data on the study habits and study methods of students.
4	"Thinking About Yourself"	A process for identification of emotionally disturbed children--prepared by the California State Department of Education.
5	Thematic Apperception Test	Used to determine the level of achievement motives--Atkinson scoring system.
6	Manning Family Index of Social Position (an adaptation of the Hollingshead Family Index of Social Position)	Used to determine whether socio-economic conditions affected academic achievement.
	and	
	Personal Interview Data	Used to determine the relationship between selected home conditions, parents' attitudes toward school, decisions on vocational goals, plans for the post-high school period, and academic achievement.
7	Health examination by a practicing physician	Used to determine if differences in physical health of students representing the various groups were significant factors in academic achievement.

The sample for these measures was composed of seventh-grade students who had been in the study the previous year. They were selected from the total population of each district by a stratified-random procedure. Ten cases of underachievers for each sub-group category were sought (a total of 30 underachieving boys, for example) and 15 cases for each sub-group category of normal achievers were sought. This made a sample from each district of 150, or a total sample of 300.

Categories of sub-groups in the sample from each district were:

Ability levels of underachievers

Boys:	Girls:
Above-average ability	Above-average ability
Average ability	Average ability
Below-average ability	Below-average ability

Ability levels of normal achievers

Boys:	Girls:
Above-average ability	Above-average ability
Average ability	Average ability
Below-average ability	Below-average ability

Statistical procedures. Total number of cases, per cent of cases, and tests for significance were used in the statistical analysis. Significant differences were determined on the hypotheses by the use of the standard error of the difference between means and the t test, or by the use of chi square.

Comparisons of boys versus girls in each group of both districts were made as one of the first steps in the analysis. Where no significant differences existed between sexes, they were grouped together to provide a larger sample.

Where no significant differences existed between districts, the research became a descriptive study of underachievement and grouping.

Findings

The first hypothesis stated, "There are no significant differences related to sex between boys and girls in regard to the following hypotheses." On the basis of the data, this hypothesis was rejected. There were more than twice as many boys who were underachievers as there were girls. This was true for both districts; findings were

significant.

The second hypothesis stated: "There is no significant difference in (a) the number of underachievers, nor (b) in the magnitude of underachievement in the two districts surveyed." Part (a) of the hypothesis was rejected and part (b) accepted. District R had significantly more underachievers than District A. The differences in magnitude of underachievement in the two districts were not significant (magnitude referring to the average number of months below the cutting point for underachieving).

In addition to the above, chi square analysis of the data produced the following findings significant at the 1 per cent level:

1. There were significantly more sixth- than fourth-grade underachievers in District A and District R.

2. Compared to total underachievers, there were more sixth-grade students of above-average ability who were underachievers in District R as compared with District A. The reverse was true for students of below-average ability.

3. Compared to total underachievers, there were proportionately fewer below-average sixth-grade students who were underachievers in District R as compared with District A.

The third hypothesis was stated as, "Underachievers do not have significantly inferior study habits as compared with normal achievers." The comparison of study habit patterns between ability-grouped and random-grouped pupils of District A versus District R gave no significant results on any of the three ability levels, although two groups approached significance at the 5 per cent level. From the data it

appeared that for the sample used in the study, the null hypothesis would have to be accepted. It did not appear that study methods and habits played a major role in underachievement.

The fourth hypothesis was stated as, "There is no significant difference between the amount of emotional disturbance in normal achievers as compared with underachievers." In making total group comparisons of underachievers versus normal achievers in both districts, the results indicated that the null hypothesis would have to be accepted. There were no significant differences between normal achievers and underachievers in either district when total groups were compared.

However, in District A there was a trend (significant at the 10 per cent level) for total District A normal achievers to have more emotional disturbance than total District A underachievers. Too, in the below-average sub-groups of District A, the normal-achieving group again showed a greater amount of emotional disturbance then the underachievers. This difference was significant at the 1 per cent level.

Between District R underachievers and District R normal achievers there were no significant differences of any kind.

Inter-district comparisons of total comparable groups were not significant. In the below-average sub-groups, the District A normal achievers had a greater amount of emotional disturbance that the District R normal achievers (difference significant at the 1 per cent level). In the above-average sub-groups, District A underachievers showed more emotional disturbance than District R underachievers (difference significant at the 5 per cent level).

The fifth hypothesis stated that "Underachievers, as compared with normal achievers, do not show a significantly smaller amount of achievement motives." No significant differences in amount of achievement motives between underachievers and normal achievers was found either within each district nor between districts, therefore the null hypothesis was accepted. Significant differences were found in both districts between some levels of ability, however. The students of better ability (average and above-average) showed more achievement motives than the students of lower ability.

The sixth hypothesis stated: "No significant difference exists between home conditions, including the socio-economic aspect and the parents' attitudes toward school, of underachievers as compared with normal achievers." This hypothesis was accepted; there were no overall significant differences in the inter-district comparisons for either factor. There were some significant socio-economic relationships between students of various ability levels on an intra-district basis, however, both in District A and in District R. The relationship was in favor of the homes with the higher standards.

The seventh hypothesis was stated as, "There is no significant difference in the health of underachievers as compared with normal achievers." This hypothesis was accepted; no significant differences were found.

Conclusions

On the basis of the findings of this study, the following conclusions were reached:

1. Under the present educational system, boys cannot compete on a par with girls in the classroom. Lesson material, curricula, and faculty usually appeal more to the interest and aptitude of girls than boys.

2. During the time a student advances from the fourth to the seventh grade, many environmental and personal factors are introduced into the lives and educational experiences of boys and girls which tend to distract them from maintaining the high level of achievement they had in the beginning.

3. Special or homogeneous grouping is desirable for students of above-average ability, but is questionable for students of average or below-average ability.

4. Special or homogeneous grouping causes some anxiety and emotional disturbance among average and below-average students; therefore, the value of any academic gains noted should be weighed against these possible counter-influences.

5. Goals within reach, aspirations, and positive self-concepts among students are beneficial and should be regularly encouraged by teachers and parents.

6. Individuals within families and communities profit academically from favorable socio-economic conditions. The promotion of such conditions is therefore a worthwhile educational goal in our society.

7. Underachievement on the part of a student is a much more complex problem than many educators have heretofore believed. It appears to be an outgrowth of the total experience and personality-complex of the student and the roots of the difficulty may be deep. Generally speaking, it would be unrealistic to lay a student's long-term underachievement

to any <u>one</u> specific cause; many influences and felt needs have shaped his course of action.

IMPLICATIONS AND RECOMMENDATIONS

When the United States of America holds the key position in world leadership, and when excelling in science and technology appears to be absolutely necessary for national survival, it would be unfortunate indeed if our schools did not measure up to this challenge and need. Too, since it will never be possible to learn all there is to know, that which is of most worth to the individual and to society should receive most attention from learners and educators. Time is priceless.

Military service requirements, increased educational demands, and other pressures upon our youth in their adolescent years tend to delay marriage beyond the period of physiological readiness, which is not a wholesome condition. Education needs to be streamlined for this reason, if for no other.

The time when it was as "hard to get changes in education as to move a graveyard" should have disappeared long ago. Methods and curricula which have lost their usefulness should be discarded in favor of more functional ones. Every promising idea for changes in our educational system should bear the scrutiny of a philosophy dedicated to the improvement of the individual and his potential contributions to society. If homogeneous grouping meets this standard, educators should not hesitate to use it. That the talented and gifted should not be held back because of heterogeneous grouping where teaching must be geared to the average seems beyond question. On the other hand, the low-ability student needs some stimulation and leadership from his peer group.

As a result of impressions received during the course of this investigation, the following recommendations are made:

1. An open-minded approach to the whole problem should be taken by parents and educators--a willingness to admit weaknesses when found should be shown, and the substitution of better methods should be expedited without egos being involved and without face-saving tenacity to a lost cause getting in the way of the progress needed.

2. A grouping of two main units, rather than the traditional three, should be considered. Special education classes usually remove from the student body at large educable children in the 50 to 80 I.Q. range. In most classes, therefore, students range from those who could be expected to achieve modestly to those gifted students who are the hope of the nation. The presence of gifted children in the same class with low-ability students often creates a situation in which the low achiever may feel that goals set for the class as a whole are so far out of reach that they are inaccessible. Goals more nearly within his reach could be set for the class if the gifted were segregated.

If only two main groupings were used--the average and slow students being grouped together, and the gifted segregated--this arrangement would minimize some of the dangers or problems presented by the critics of homogeneous grouping. Possible stigma attached to the lower group would be lessened, if not removed. Desirable peer group leadership and opportunities for wider social experience would still be present.

3. Somewhere in the program, there should be opportunities for all to mix on a common basis, because all people (and especially leaders)

in many life situations will be faced with a need to know, understand, and appreciate the limitations and contributions that each strata of society makes to the good of the whole.

Extra-curricular activities offer excellent opportunities here, as do some of the physical education classes. It has been cited in this study that frequently good results have been obtained in the social studies are under grouping, but some investigators and students of the problem feel that the social study area is the one place that all should meet on a common footing, in spite of the possibilities of greater achievement gains under grouping.

4. Teacher-load should not be so great that objectives cannot be reached. This is especially true in classes of below-average students where the teacher finds an accumulation of problems. Students who already lack ability to learn easily should not be penalized by having only incorrigible underachievers for team mates and peer group leaders.

5. Whatever type of grouping is used, it should be flexible enough to allow students to move on when they have proved themselves.

6. More care should be taken to select teachers with whom boys can identify.

7. Additional research should be done on the causes of increased underachievement as students progress from the fourth to the sixth grade.

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APPENDIXES

APPENDIX A

Form B For Girls*

THINKING ABOUT YOURSELF

Prepared by Carl A. Larson and Eli M. Bower
California State Department of Education, Sacramento

The questions in this booklet will make you think about yourself. Because all of you like different things, each of you will probably answer the questions differently. What you say will help us to find out what girls like you are thinking and wishing. Do your best to make your answer to each question tell what *you* really think and really wish.

Name_____

Age_____ School District_____

School_____

Grade in School_____ Date_____

HOW TO ANSWER THE QUESTIONS IN THIS BOOKLET

This is an EXAMPLE of the questions you will be asked to answer:	Always	Frequently	Seldom	Never
This girl is usually picked first to play on a team.				
1. Are you like her?	1	2	3	4
2. Do you want to be like her?	5	6	7	8

In answering the first question, "Are you like her?"—you can place an X in any one of the four boxes. If you feel you are like this girl always, place the X in Box 1. If you feel you are like this girl frequently, place an X in Box 2. If on the other hand you feel you are like this girl seldom, place the X in Box 3. If you feel you are never picked first to play on a team, place the X in Box 4.

In answering the second question, you have to think about what you want to be and put an X in the box which would be *most true for you.* If you would like to be someone who is picked first always, place the X in Box 5. If you would like to be picked first frequently, place the X in Box 6. If on the other hand you would like to be this girl seldom, place the X in Box 7. If you don't care at all and would never like to be chosen first, place an X in Box 8.

Now try to complete the two examples below—

	Always	Frequently	Seldom	Never
This girl likes to do daring things.				
1. Are you like her?	☐	☐	☐	☐
2. Do you want to be like her?	☐	☐	☐	☐
This girl worries about tests.				
1. Are you like her?	☐	☐	☐	☐
2. Do you want to be like her?	☐	☐	☐	☐

If you still don't understand how to answer the questions, raise your hand. Also, if you need help later on, raise your hand. Your teacher will give you the help you need.

Now turn the page and begin.

*Form A For Boys is identical, except for substitution of "boy."

	Always	Frequently	Seldom	Never
1. This girl has bad dreams. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
2. This girl likes to tease boys. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
3. This girl hates school. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
4. This girl thinks her mother doesn't like her. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
5. This girl has lots of spending money. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
6. This girl gets in trouble in school. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
7. This girl can go to the movies any time she likes. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
8. This girl is happy. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
9. This girl would like to be a boy. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
10. This girl is afraid of teachers. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐

	Always	Frequently	Seldom	Never
11. This girl plays with her dad. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
12. This girl gets to class late. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
13. This girl would rather play with boys than with girls. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
14. This girl is asked by the teacher to be in charge when the teacher leaves the room. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
15. This girl tells her parents when she worries. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
16. This girl wishes she were grown up right now. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
17. This girl likes to play with younger children. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
18. This girl gets good marks in her school work. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
19. This girl cries easily. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
20. This girl picks on smaller children. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐
21. This girl would quit school if she could. Are you like her? Do you want to be like her?	☐ ☐	☐ ☐	☐ ☐	☐ ☐

	Always	Frequently	Seldom	Never
22. This girl gets upset.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
23. This girl likes to play by herself.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
24. This girl wants her teacher to like her.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
25. This girl likes to stay in bed late in the morning.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
26. This girl hates dogs.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
27. This girl plays games better than other girls her age.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
28. This girl feels that teachers treat other children better than they do her.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
29. This girl would like to run away from home.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
30. This girl gets angry easily.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
31. This girl gets invited to many parties.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
32. This girl is the best-liked girl in this room.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐

	Always	Frequently	Seldom	Never
33. This girl is made to study at home.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
34. This girl gets tired easily.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
35. This girl is a tomboy.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
36. This girl is the leader of the class.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
37. This girl is afraid of her father.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
38. This girl has trouble going to sleep.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
39. This girl thinks that most of the children like her.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
40. This girl can stay up at night as long as she wants to.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
41. This girl likes to sit and daydream.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
42. This girl would like to be famous.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐
43. This girl thinks her mother picks on her.				
Are you like her?	☐	☐	☐	☐
Do you want to be like her?	☐	☐	☐	☐

	Always	Frequently	Seldom	Never
44. This boy is afraid of the dark.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
45. This boy worries about school.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
46. This boy feels like hurting other children.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
47. This boy likes to be a bad boy in school.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
48. This boy likes to play with older children.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
49. This boy's mother treats him like a baby.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
50. This boy's father spanks him.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
51. This boy feels that his teacher likes him.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
52. This boy likes to play with dolls.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐
53. This boy wants to be a stunt flyer.				
Are you like him?	☐	☐	☐	☐
Do you want to be like him?	☐	☐	☐	☐

APPENDIX B

TAT SCORING SHEET

NAME _____ TEST TAT SCHOOL _____ LEVEL _____

Item	Story #1	Story #2	Story #4	Story #16
UI				
TI				
AI				
Ga+				
Ga-				
I+				
N				
Bw				
Bp				
G+				
G-				
Nup				
Th				
SCORES				

TOTAL SCORE _____

APPENDIX C

INDIVIDUAL INTERVIEW

Student's name_____ District_____ School_____
Level: 1.___ 2.___ 3.___; UA___, NA___, Date_____ Grade_____

SOCIO-ECONOMIC CONDITIONS

1. Who in your family is chiefly responsible for making a living?_____
2. What is his (her) occupation?_____
3. Describe in a few words what he (she) does._____

VOCATION

4. Hollingshead scale value:

Description	Scale
Exec. & propr. large concerns; major professionals . .	1___
Exec., managers, and propr. med. concerns; lesser prof.	2___
Adm. Pers., lg. concerns; semi-prof.; owners indiv. bus.	3___
Owners of little bus., clerical workers, salesmen . .	4___
Skilled workers.	5___
Semi-skilled workers	6___
Unskilled workers	7___

SCHOOLING

5. How much schooling did he (she) complete?

	Head	Other
Graduate degree: M.S., Ph.D., Ed.D. 1		
Standard college or B.S. degree 2		
One full year college, but not B.S. degree . . 3		
High school graduate 4		
Partial H.S. (grade 10 or 11, but did not grad.) 5		
Jr. High completion (7 through 9) 6		
Elementary only (& those not compl. 7th grade . 7		

6. If you have older brothers or sisters, did they go to college?_____
7. Did they pay their own way in full?_____ In part?_____
8. Do your parents want you to have a college education?_____

GOALS AND ACHIEVEMENT MOTIVES

9. What would you like to be?_____
10. What do your parents want you to be?_____
11. Who will make the final decision? You___, Dad___, Mother___, Undecided___, Joint___
12. What will you do after high school?_____
13. Is there some unusual or special goal that you hope to achieve?

_____

14. How many months or years of specialized education or training will this require? (long-range envolvement)_____

15. How skilled do you intend to become in this field? (What standard of excellence?)_____

16. Is there someone that you know of in this field that you admire? (What unique accomplishment?)_____

SELF-CONCEPT

17. Are your goals consistent with your achievement this far?_____

18. What kind of grades do you expect to get during Junior High School_____ High School_____ College_____?

HOME CONDITIONS AND PARENTS' ATTITUDE TOWARD SCHOOL

19. Do you have a quiet, well-lighted place at home where you can study?_____

20. Do your parents encourage you to study regularly at home?_____

21. Do your parents frequently give you praise or encouragement for your school work?_____

APPENDIX D

HEALTH INVENTORY

SPONSORED BY THE UNITED STATES OFFICE OF EDUCATION

IN COOPERATION WITH UTAH STATE UNIVERSITY

Student's name_____ Parent's name_____

Address_____ Phone_____

Parental consent to examination_____
(Signature)

CASE HISTORY:

Diseases: Complications:

PHYSICAL EXAMINATION:

1. Urine_____ 2. Hemaglobin_____ 3. Blood Pressure___

4. Vision: L___ R____ 5. Hearing: L___ R____ 6. Ht. & Wt. (over)

7. Ears_____ 8. Nose_____ 9. Throat_____

10. Lungs_____ 11. Heart_____ 12. Abdomen_____

13. Hernia (boys only_____ 14. Extremities_____

COMMENTS: (Low vitality and/or energy, obvious undernourishment, handicaps, deficiencies, abnormalities)

Examining physician_____ Date examined_____
(Signature)