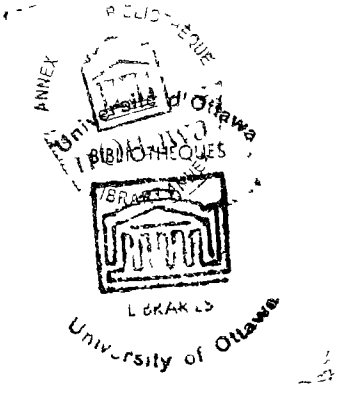
# A COMPARISON OF LOWER AND HIGHER ACHIEVERS IN GRADES FIVE AND SIX ON CERTAIN INTELLECTUAL AND SOCIAL FACTORS

by Sister Mary Francis, O.S.F.

Thesis presented to the School of Psychology and Education of the University of Ottawa as partial fulfillment of the requirements for the Master of Arts degree in Psychology

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## CURRICULUM STUDIORUM

The writer was born July 23, 1912, in Minneapolis, Minnesota. She received the Bachelor of Science degree in Education from De Sales College, Toledo, Ohio, in 1942.

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# INTRODUCTION

Learning is a complex process with many implications stemming from psychological, sociological and physical influences. Educators, aware of this complexity, seek to employ all the techniques at their disposal for making the learning situation realistic. It has been widely accepted, that basic to all effective learning is the fact that due cognizance be given to the differences in abilities, the uniqueness of the individual, and the fact that each pupil has a different set of impinging influences. In this light only can educators assist the pupil in his learning activities at the level of comprehension and meaning of which he is capable.

In the learning situation, the teacher is often confronted with the task of assisting boys and girls who do not reach a level of competency commensurate with their ability. The causative factors contributing to this lack of academic accomplishment, whether they be the lack of basic skills, or the familial, teacher or peer influences upon the attitudes, interests and motives in learning, definitely deprive the individual of that inner urge to develop whatever ability he has. His underachievement is but an external manifestation

of an inner state. "We should remember that underachievement is only symptomatic, and that there are underlying causative factors."[1]

The cue for the need of this type of investigation can be taken from Anastasi and Foley, who in their discussion of variability within individuals say, "The study of variations from trait to trait within the individual is both of practical importance and theoretical significance."[2]

When a total score is obtained on a mental ability, an achievement or personality test, there is still much that remains to be known before a correct interpretation can be made of a subject's real performance or ability to perform. Two individuals obtaining the same total score, may present very different mental, achievement or personality pictures when their performance along certain lines is analyzed. There is a growing realization that the question of variation among the individual's abilities deserves serious and systematic consideration and should be investigated in its own right. The awareness of the importance of this problem makes the establishment of the individual's general level of performance less significant, for if his traits were all more or

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1 Herman J. Peters and Gail F. Farwell, Guidance: A Developmental Approach, Chicago, Rand McNally, 1959, p. 340.

2 Anne Anastasi and J.P. Foley, Differential Psychology, New York, MacMillan, 1949, p. 457.

less on the same level, a single summary score would be quite informative. However, it is essential that inquiry be made as to the extent of variation within the individual, if he is to be understood more thoroughly. In the light of his deficiencies and strengths, a more satisfactory type of academic program may be planned.

Keeping the foregoing in focus, this study proposes to compare two groups, lower achievers and higher achievers, with respect to the mental abilities operative in intelligent behavior, and the presence or absence of certain social factors in each group, both of which may contribute to a greater success of the one and diminish the success of the other. Are the factor patterns of intelligence and the needs or problems of social adjustment of the two groups, which are differentiated on the basis of their academic achievement, alike or different? Do the higher achievers manifest a different type of factor pattern in the performance of tasks of intelligence? Do they experience needs and problems in areas which differ from those of the lower achievers? Even if the primary factors should be named the same for both groups, do they have like components in both cases?

More specifically, the problem resolves itself into the following question: How do lower and higher achievers within the 90-119 I.Q. range, in grades five and six, compare on the distribution of their mental abilities and the level

of adjustment in certain areas?

The first chapter of this study, presents the background of the problem, including a review of the literature with respect to research studies concerning the influence of dynamic and cognitive factors on scholastic achievement. After a brief summary, the basic hypothesis is presented with definitions of terms.

Chapter two is concerned with an explanation of the procedure used in the selection of the sample population. The tools of measurement, their administration and the statistical method used for the analysis of the data is then described.

The results computed upon the administration of the SRA Primary Mental Abilities Test and the SRA Junior Inventory are presented in the third chapter. They are discussed in chapter four. A summary and conclusions follow with possible implications.

# CHAPTER I

## REVIEW OF THE LITERATURE

Evaluation of pupil characteristics is a challenging task because many of the human qualities related to educational goals are not readily measurable. Complex factors, such as personality traits, mental characteristics and scholarship have no universally accepted yardstick or scale by which they can be measured. Thus, educators and research workers have taken upon themselves the task of establishing meaningful methods of measuring pupil status and progress relative to worthwhile educational goals. Ability, achievement and personality tests have been used to view the pupils from different vantage points since all techniques of measurement and evaluation are approaches to the understanding of personality, the "whole" child.

That individuals differ in mental abilities, as well as in physique and traits of personality, has been known for many centuries, although it is only within relatively recent years that the extent, causes and educational significance of these variations have been studied. Caswell observes, that often individual differences are considered by implication as something to be overcome, a limiting factor in instruction. Rather, they should be made basic in all considerations that enter into the total phase of planning and developing an

educational program. The existence of individual differences is a normal condition of nature which is present in all characteristics and abilities. Not only do individuals differ greatly from one another, but a given person varies greatly in abilities and characteristics, which fact gives rise to much of the richness of living and many important achievements which result from men's differences in capacity, ability and outlook. Adequate education should tend to increase rather than decrease most differences, by seeking out the most promising potentialities of every child and cultivating them with special care.

> In planning and developing the program of the elementary school, a realistic, sound view of the differences which exist among children and the role these differences should play in the educative process is essential. Children should be studied to discover what their differences are, not with the idea that these differences should be eliminated or the program adjusted to them, but rather, with the view that they provide the basis upon which rich and varied personalities may be developed and out of which a co-operative society with maximum complementary factors may be built.[1]

With this consideration in the foreground, education is especially concerned with individual differences in school achievement which may be due primarily to differences in intellectual capacity but may also be attributable to different degrees of motivation, quality of instruction, sensory

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1 Hollis L. Caswell, Education in the Elementary School, Chicago, American Bk. Co., 1942, p. 103.

handicaps, physical disabilities, or differences in personality and behavioral traits. At times, a pupil's school achievement reflects his status in two or more of these factors rather than in mental ability alone. Children with identical I.Q.'s may be very different in other traits and may even be radically different in the distribution of their mental abilities.

Educators have begun to make a conscious effort to study the individual child, so that habits of low achievement which develop over the years, may be prevented with the proper guidance. A review of the literature which deals with some of these problems follows. It has been divided into the research studies which deal with some dynamic factors and their influence on scholastic achievement, and those which are concerned with the various aspects of the cognitive factors as related to achievement. The latter include such aspects as mental ability and achievement, sex differences and achievement, the effect of increase of age on mental ability, self-concept and achievement, and the onset of underachievement. Finally, a summary of the literature is made and the basic hypothesis is presented.

## 1. Dynamic Factors and Scholastic Achievement.

Of the many research studies concerned with the dynamics of personality and academic success or failure, the following serve to indicate avenues along which such studies have proceeded and their tentative conclusions.

Hoyt and Norman[2] examined achievement and adjustment in general terms and found a lower correlation between school grades and ability in the "maladjusted" subjects than in the "normal" ones.

Ruth Strang[3] observes that underachievement may stem from earlier educational deprivation and poor reading ability, from a lack of purpose or goal, from a general feeling of inadequacy and hopelessness or from feelings of hostility and resistance directed at parents who have deprived them of the love they need.

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2 D. P. Hoyt and W. T. Norman, "Adjustment and Academic Predictability", in Journal of Counseling Psychology, Vol. 1, No. 2, 1954, p. 96-99.

3 Ruth Strang, "The Counselor's Contribution to the Guidance of the Gifted, the Under-Achievers and the Retarded", in The Personnel and Guidance Journal, Vol. 34, No. 8, 1956, p. 494-497.

Blum[4] remarks that although developmental readiness profits from environmental stimulation, attempts to force growth are resisted. Marked differences between levels of capacity and functioning are usually symptomatic of the child's failure in dealing with the harsh demands of environmental pressure. Parental pressure to achieve results is a threat to security, and if expectance is not reached, timidity, uncertainty and readiness to give up, results. However, in reassuring atmosphere, the child's performance usually approximates that of his potential or capacity.

Klausmer[5] reports that high achieving children in the third and fifth grades were not significantly different from lower-achieving children in height, weight, strength of grip, but were superior in mental age, occupation level of parent, and classroom conduct. There was a higher incidence of girls than boys among high-achievers.

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4 Lucille H. Blum, "Not All Are Definitely Defective", in Mental Hygiene, Vol. 42, No. 2, April 1958, p. 211-223.

5 Herbert J. Klausmer, "Physical Behavioral and Other Characteristics of High and Lower Achieving Children in Favored Environments", in Journal of Educational Research, Vol. 51, No. 8, 1958, p. 573-581.

Gleason[6] conducted a similar study in which he found that uneven growth in height, weight, strength of grip and carpal development tended to be accompanied by uneven and low achievement among third and fifth grade girls, by low achievement among third grade boys, but not by low achievement among fifth grade boys.

Sister Agnes Jerome[7] reports that in her s tudy of twenty children, grades three to eight, who were achieving one or more years below the present grade, she found that learning is significantly impeded not only by retardation in intelligence, but also such factors as socioeconomic status, personality traits, physical defects and classroom adjustment.

In studying underachievement in reading, Spache[8] found five major personality patterns which are significant in understanding the child's failure in reading. These include: an aggressive group in conflict with authority figures, an adjustive group which seeks only to be inoffensive, a defensive group that is sensitive and resentful,

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6 Gerald T. Gleason, "The Relationship Between Variability in Physical Growth and Academic Achievement Among Third and Fifth Grade Children", in Journal of Educational Research, Vol. 51, No. 7, March 1958, p. 521-527.

7 Sister Agnes Jerome, "A Study of Twenty Slow-Learners", in Journal of Educational Research, Vol. 53, Sept. 1959, p. 23-27.

8 George Spache, "Personality Patterns of Retarded Readers", in Journal of Educational Research, Vol. 50, No. 6, February 1957, p. 461-469.

a solution seeking or peace-making type, and the autistic group characterized by blocking or withdrawal.

Even though Hinkelman[9] found a high correlation of verbal intelligence with nine of ten curricular areas in his longitudinal study, and that pupil progress in these areas is markedly related to intellectual ability for grades two, five and seven, he suggested that other variables such as motivation and personality be considered in analyzing the total picture of elementary school achievement.

Gray's[10] study which was concerned with the relation between three levels of emotionality and individual variability in educational achievement of six hundred sixth graders, seems to indicate a greater variability in achievement in the case of the group with the higher emotionality score.

2. Cognitive Factors and Achievement.

The cognitive aspect with respect to achievement has received even greater probing in research studies. Most of the investigators report marked relationship among abilities, though the precise nature of the abilities and the nature of

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9 Emmet Arthur Hinkelman, "Relationship of Intelligence to Elementary School Achievement", in Educational Administration and Supervision, Vol. 41, No. 3, March 1955, p. 176-179.

10 Susan Gray, "The Relation of Individual Variability to Emotionality", in Journal of Educational Psychology, Vol. 35, No. 5, 1944, p. 274-283.

the relationships is still a matter of sharp controversy.

Commins[11] made a comparison of the variability in achievement in two hundred three bright, normal and dull fifth grade pupils and found a greater unevenness in scholastic proficiency among boys. This he believed was in line with the theory that on the whole, girls are more "conformable" than boys who are moved by strong attitudes of like and dislike, which allows them greater expression of individuality. Comparing the internal variability of this same group on the basis of intelligence, he found that children with I.Q.'s above one hundred five are more uneven in their scholastic achievement than are the normal or inferior children.

Gray[12] attempted to discover the relationship, if any, existing between the level of intelligence and individual variability in educational achievement. From her study of six hundred sixth graders, she found the achievement variability a little greater among the lower intelligence group than it was in the case of the middle and higher groups, although the difference was not very great.

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11 W. D. Commins, Principles of Educational Psychology, New York, The Ronald Press Co., 1937, p. 557-561.

12 Susan Gray, "The Relation of Individual Variability to Intelligence", in Journal of Educational Psychology, Vol. 35, No. 4, 1944, p. 201-210.

Woodrow[13] made a study in mental unevenness and brightness using 1,572 subjects ranging in mental age from eight to sixteen years and eleven months. He found the bright and dull both showing greater variability than the normal when he compared the trait variability in six intelligence sub-tests for children.

Regarding sex differences in trait variability, the numerous studies of intelligence are in general agreement on two conclusions: first, that there is no significant sex difference between boys and girls in intelligence as measured by present-day intelligence tests, and second, that boys and girls differ significantly in specific abilities.

Hobson[14] and Wesman[15] substantiate the above claim, while Ruszel[16] found that although both sexes give evidence of possessing the same primary abilities, they may not be possessed to the same degree by the two sexes and their use may be quite different in test performance.

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13 H. Woodrow, "Mental Uneveness and Brightness", in Journal of Educational Psychology, Vol. 19, No. 5, 1928, p. 289-302.

14 James R. Hobson, "Sex Differences in Primary Mental Abilities", in Journal of Educational Research, Vol. 41, No. 2, October 1947, p. 126-132.

15 Alexander Wesman, "Separation of Sex Groups in Test Reporting", in Journal of Educational Psychology, Vol. 40, No. 4, April 1949, p. 223-229.

16 Humphrey Ruszel, Test Patterns in Intelligence, Wash., D.C., The Cath. U. Press, 1952, viii-70 p.

Havighurst and Breece[17] studying thirteen year olds in grades four to nine, found boys excelling in spatial tests, the girls superior in reasoning, numbers, and favored in word fluency and visual memory. The sexes were equal in verbal comprehension, but here the general information content in which boys excel may counteract the girls' superiority in verbal ability.

Concerning the question of the influence of age on the organization of mental abilities, there is lack of agreement in the findings of the various investigators. However, majority of the studies seem to indicate that abilities become more specialized with increasing age.

Garrett, Byran and Pearl[18] studied the performance of children at ages nine, twelve and fifteen, and concluded that with increase in age the abilities become more specific.

Richards[19] reanalyzed the above work and verified the conclusions that there is tendency for factors to become more independent with increasing age.

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17 R. J. Havighurst and F. H. Breece, "Relation Between Ability and Social Status in a Midwestern Community; Primary Mental Abilities", in Journal of Educational Psychology, Vol. 38, No. 4, April 1947, p. 241-247.

18 H. G. Garrett, A. I. Byran and R. E. Pearl, "The Age Factor in Mental Organization", in the Archives of Psychology, Vol. 26, No. 176, 1935, 31 p.

19 T. W. Richards, "Genetic Emergence of Factor Specificity", in Psychometrika, Vol. 6, No. 37, 1941, p. 37-42.

Schiller[20] administered twelve tests to a group of nine year old boys and concluded that at this age, verbal and numerical tests (r of .83), constitute a general factor which is fairly independent of the spatial factor.

Asch,[21] retesting Schiller's original subjects after three years, reported the same trend found by Garrett[22] and Richards[23] that the general factor was clearly less important as the age of the subjects increased.

Clark[24] using Thurstone's test of primary mental abilities, studied the changes in the factor patterns of three hundred twenty boys at ages eleven, thirteen and fifteen. Intercorrelations of his primary factors showed a tendency to drop with age.

Similarly, Jones[25] compared the scores of two hundred pupils at each of four age levels, seven, nine, eleven, and

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20 B. Schiller, "Verbal, Numerical, and Spatial Abilities of Younger Children", in Archives of Psychology, Vol. 24, No. 161, 1934, 69 p.

21 S. E. Asch, "A Study of Change in Mental Organization", in Archives of Psychology, Vol. 28, No. 195, 1936, 30 p.

22 Garrett, Op. Cit., 31 p.

23 Richards, Op. Cit., p. 37-42.

24 M. Clark, "Changes in Mental Organization with Age", in Archives of Psychology, Vol. 41, No. 291, 1944, 30 p.

25 Lyle V. Jones, "A Factor Analysis of the Stanford-Binet at Four Age Levels", in Psychometrika, Vol. 14, No. 4, December 1949, p. 299-331.

thirteen. The results show that the factors are not stable and that they become more specialized with age.

The specialization of abilities with increased age is indicated by the results of the two studies by Thurstone and Thurstone[26]. In the earlier study, where older subjects were used, the intercorrelations were quite negligible and the authors concluded that the primary factors extracted were essentially independent. In the later study[27] they tested 1,154 eighth graders and extracted ten factors which they later reduced to six primaries and a second-order general factor, identified by them as probably equivalent to Spearman g.

On the other hand, several studies fail to corroborate the above findings and stress the importance of the general over the specific factors with the increase of age.

Curtis,[28] in studying the same group as Asch, reports results which give evidence of an increase with age of the importance of the general factor.

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26 L. L. Thurstone and T. G. Thurstone, "Primary Mental Abilities", Psychometric Monographs, No. 1, Chicago, U. of Chicago Press, 1938, ix-121 p.

27 --------, "Factorial Studies of Intelligence", Psychometric Monographs, No. 2, Chicago, U. of Chicago Press, 1941, v-94 p.

28 Hazen Alonzo Curtis, "A Study of the Relative Effect of Age and of Test Difficulty Upon Factor Patterns", in Genetic Psychological Monographs, Vol. 40, 1949, p. 99-148.

Burt's[29] findings were in agreement with those of Curtis. The importance of the general factor was positively related to increment in age.

Swineford[30] concluded from her several studies of the general, verbal and spatial bi-factors that the specific factors became less important and the general factor increased both in its absolute and relative contribution to the total test variance with age increase.

Thus it can be seen that the question of the influence of age on the organization of mental abilities has contradictory answers. The majority of studies do, however, seem to indicate that abilities become more specialized with increasing age.

Regarding self-concept and achievement, the account of Cohen,[31] and Diller,[32] substantiate the general principle that as the self-concept becomes more favorable, learning ability improves.

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29 Cyril Burt, "The Structures of the Mind, A Review of the Results of Factor Analysis", in British Journal of Educational Psychology, Vol. 19, 1949, p. 176-199.

30 F. Swineford, "Growth in General and Verbal Bi-Factors from Grade Seven to Grade Nine", in Journal of Educational Psychology, Vol. 38, No. 5, 1947, p. 257-272.

31 T. D. Cohen, "Level of Aspiration Behavior and Feelings of Adequacy and Self-Acceptance", in Journal of Abnormal Social Psychology, Vol. 49, No. 1, 1954, p. 84-86.

32 L. Diller, "Conscious and Unconscious Self-Attitudes After Success and Failure", in Journal of Personality, Vol. 23, 1954, p. 1-12.

Chickering[33] indicates that academic achievement varies with respect to the relationship between actual self-perception and ideal self-perception, such that as the discrepancy increases, achievement in relation to expectancy decreases. Students achieving below expectancy differ in actual self-perception from students achieving above expectancy. The results further suggested that ideal self-perception of over and underachievers are more similar than are the actual self-perceptions of these two groups.

A few studies have investigated the onset of lower achievement. Frankel[34] states that the factors relating to scholastic underachievement of his group of fifty paired boys may have been operating before the students entered high school.

More specifically, Barrett,[35] states that the pattern of underachievement is apparent by grade five.

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33 A. W. Chickering, Self-Concept, Ideal Self-Concept and Achievement, Doctor's Thesis, Columbia U., New York, 1958, 81 p.

34 Edward Frankel, "A Comparative Study of Achieving and Underachieving High School Boys of High Intellectual Ability", in Journal of Educational Research, Vol. 53, No. 5, Jan. 1960, p. 172-180.

35 Harry O. Barrett, "An Intensive Study of Thirty-Two Gifted Children", in Personnel Guidance Journal, Vol. 36, No. 3, 1957, p. 192-194.

Shaw and Grubb[36] hypothesize that underachievement among bright students is not a problem which has its genesis within the educational framework, but rather one which the underachiever brings with him, at least in embryo form, when he enters high school.

Shaw and McCuen[37] report that in their study of achievers and underachievers, they found that the results for males indicated that underachievers tended to receive grades lower than achievers beginning in grade one and that the difference between means became significant at .01 level at grade three. From grade three to ten the difference increased significantly every year. In grade ten and eleven, the difference was reduced somewhat but remained significant at .01 level. The decrease in these grades was due to a slight drop in the grades of the achievers. Results for the females indicated that female underachievers actually exceeded in grade point average for the first five years of school although not at a significant level of confidence. Beginning in grade six, underachievement began a precipitous drop in grade point average and remained below the achieving group

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36 M. S. Shaw and J. Grubb, "Hostility and Able High School Underachievers", Journal of Counseling Psychology, Vol. 5, 1958, p. 263-266.

37 Merville C. Shaw and John T. McCuen, "The Onset of Academic Underachievement in Bright Children", in the Journal of Educational Psychology, Vol. 51, No. 3, June 1960, p. 103-108.

from grade six through grade eleven. The difference became significant at grade nine. The authors suggested the early identification of underachievement.

### 3. Summary and Basic Hypothesis.

In summary, the studies which have been reviewed, certainly point to the existence of trait variability with respect to school achievement due to the influence of the various dynamic and cognitive factors. What relationship exists between these factors and trait variability is not fully established and authors are not always in harmony regarding the results of their studies as to sex differences, the effect of increase of age on the organization of mental abilities, and the onset of lower achievement. The findings indicate the importance of a knowledge of trait variability in meeting the needs of children as individuals.

Generally, these research studies have been concerned with underachievers and/or overachievers as compared to the average achievers. No comparison has been made, however, between the performance of lower and higher achievers of approximately the same age and grade, in the average and above average group. Are there possibly "hidden" lower achievers in the ordinary classroom who, though not failing according to the school standards, are not functioning to individual capacity? Do their patterns of intelligence differ signifi-

cantly from that of others within the same group who achieve to a higher degree? Even if the trait variabilities of intelligence are the same, is their achievement perhaps affected by problems in various areas of the environment?

It is to investigate this problem that the present study has been undertaken. More specifically, it attempts to study empirically the following null hypothesis: There is no statistically significant difference between the performance on the SRA Primary Mental Abilities Test, Form AH, and on the SRA Junior Inventory, Form S, of children within the I.Q. range of 90-119, in grades five and six, who achieve according to their capacity and those who operate below their appropriate level.

This study is limited to individuals within the I.Q. range of 90-119, as measured by The California Short-Form Test of Mental Maturity, for a practical reason. As James Drasgow[38] points out, with the concern in recent years about the extreme groups, that is, the superior students (considered in many research studies as having I.Q.'s of 120 or more), and the slow learners (I.Q.'s of 80-90) in the ordinary classroom, the middle group, much as the middle sib in the family, is "lost in the middle". It is overlooked and neglected, and

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38 James Drasgow, "A Plea for the Average Normal Student", in The Vocational Guidance Quarterly, Vol. 6, No. 2, Winter 1957-1958, p. 107-108.

yet this group constitutes the majority and later becomes the bulwark of our society. Freeman states that,

> Although it is a major task of schools to discern and cultivate superior and creative intellects, and to bring the subnormal to their maximum levels of effectiveness, it is nevertheless true that the many individuals compassed within the "average" group also present definite idiosyncracies. In a literal sense, everyone is exceptional; although classifications are possible with respect to a given aspect of individuality, and although there is a concentration of cases about the central tendency in a given trait, it is the integration of numerous and varied characteristics that gives a person his individuality.[39]

Smith states explicitly that "Every school and every teacher makes some adjustment in levels of performance expected of the child with an I.Q. of 70 and the child with an I.Q. of 130."[40] Gates observes that "...there is always the likelihood that those above 105 will be given less attention merely because they can keep up with the class."[41]

Furthermore, errors of measurement on tests can easily throw a person from one class into another. It must be also remembered that there are great differences within the individual and typing on the basis of I.Q. might have little

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39 Frank S. Freeman, "Individual Differences in Mental Abilities; Their Educational Implications", as quoted by Charles E. Skinner, Ed., Educational Psychology, New Jersey, Prentice-Hall, Inc., 1959, p. 727

40 Henry P. Smith, Psychology in Teaching, New York, Prentice-Hall, Inc., 1954, p. 292.

41 A. I. Gates, A. T. Jersild, T.R. McConnell, and R. C. Challman, Educational Psychology, New York, Macmillan Co., 1948, p. 250.

connection with abilities in other areas.

It is an undisputed fact that guidance should start as early as possible so that the maladjustment is not given an opportunity to become part of the child which after a long period of time becomes increasingly more difficult to remove. From the standpoint of the most effective period for preventing problems from arising and improving those problems which have displayed themselves, as found in previous studies, grades five and six have been chosen. Caswell, in describing the child of this age says that,

> His interests tend to become more specialized, and he recognizes that work as well as play is a desirable activity. His creative possibilities are very high, due in part at least to his semi-insulation to the critical adult world. The word "study" takes on meaning and under good guidance he becomes an eager learner.[42]

Thus an early identification of lower achievement or underachievement in grades five and six would be advantageous to both pupil and teacher.

For this reason, two groups of achievers in grades five and six will be considered in this study, namely, a group of lower achievers and a group of higher achievers, both within the I.Q. range of 90-119.

A lower achiever will be identified as a pupil operating five months or more below his mental age in scholastic achievement. A higher achiever will be considered

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42 Hollis L. Caswell, Op. Cit., p. 118.

as that child whose academic achievement corresponds to five months or more above his mental age.

# CHAPTER II

## PROCEDURE OF THE STUDY

This chapter presents the procedures followed in obtaining the empirical data to test the hypothesis proposed in the preceding chapter.

The sample population is first described with reference to the criteria for the selection. This is followed by a description of the measuring instruments used in this study, the administration of these tests to the selected groups, and the statistical method used in the analysis of the data.

### 1. The Sample.

The subjects for this study were drawn from five urban schools which are operated by the Sisters of Saint Francis from Sylvania, Ohio, in the Diocese of Toledo, Ohio. This was done on a purely voluntary basis by the principals and teachers.

The California Achievement Tests, Complete Battery, Elementary, Grades 4-5-6, Form Y,[1] devised by Ernest W. Tiegs and Willis W. Clark, 1957 edition, and the California

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1 Ernest W. Tiegs and Willis W. Clark, Manual, California Achievement Tests Complete Battery, California, California Test Bureau, 1957, 62 p.

Short-Form Test of Mental Maturity, Elementary, Grades 4-5-6-7-8, 1957 S-Form,[2] devised by Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs, were administered to six hundred seven pupils in grades five and six in the month of January and February, 1961. It was on the basis of the results of these tests that the two groups of achievers were chosen for the study. Each student was compared on his achievement battery grade-placement and his mental age grade-placement. With a discrepancy of five months or more, over and above his mental age, the pupil was considered as a higher achiever. Functioning five months or more below his capacity, the student was selected as a lower achiever. Both groups were within the I.Q. range of 90-119 and in grades five and six. The mean I.Q. for both grades was 105.7 . The mean chronological age for pupils of grade five was 127.3 months. For the sixth grade students, it was 138.5 months. The results of the two tests are presented in Table I.

The socio-economic status of these pupils was also noted, for as Thompson states, "...environmental differences of substantial magnitude do produce different rates of mental

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2 Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs, Manual California Short-Form Test of Mental Maturity, California, California Test Bureau, 1957, 32 p.

Table I.- Means and Ranges of Mental Age Grade Placement (M.A.G.P.) and Achievement Battery Grade Placement (A.B.G.P.) of the Lower (L) and Higher (H) Achievers Distributed as to Grades and Sex Considered Separately (B,G) and Together (T).

| Grade | Group | N | M.A.G.P. | | A.B.G.P. | |
|---|---|---|---|---|---|---|
| | | | Mean | Range | Mean | Range |
| 5 | L.B. | 34 | 6.50 | 4.8-8.4 | 5.50 | 4.1-7.0 |
| | L.G. | 7 | 6.69 | 6.3-7.2 | 5.90 | 5.5-6.6 |
| | L.T. | 41 | 6.54 | 4.8-8.4 | 5.60 | 4.1-7.0 |
| | H.B. | 20 | 5.20 | 4.2-6.5 | 6.30 | 5.1-7.3 |
| | H.G. | 41 | 5.70 | 4.2-6.9 | 6.80 | 5.5-8.3 |
| | H.T. | 61 | 5.50 | 4.2-6.9 | 6.60 | 5.1-8.3 |
| 6 | L.B. | 33 | 7.58 | 5.9-9.0 | 6.60 | 5.3-8.0 |
| | L.G. | 18 | 7.61 | 5.9-8.8 | 6.60 | 4.9-7.7 |
| | L.T. | 51 | 7.59 | 5.9-9.0 | 6.60 | 4.9-8.0 |
| | H.B. | 15 | 5.90 | 4.6-7.7 | 6.70 | 5.6-8.4 |
| | H.G. | 30 | 6.47 | 5.0-8.2 | 7.56 | 6.4-8.7 |
| | H.T. | 45 | 6.29 | 4.6-8.2 | 7.30 | 5.6-8.7 |

growth in children with hypothetically equal hereditary endowment."[3] Using Super's[4] explanation of the middle class as a guide, with the exception of one pupil who was eliminated because his father was in the medical profession, the remainder of the two groups belong to the middle class, judging from the fathers' occupations.

The data in Table I reveal that the mean grade placement of the higher achievers, when comparing the achievement to the mental age, is nine months above their ability, while that of the lower achievers is nine months below their appropriate capacity. The mean grade placement for both criteria tends to rise for the girls. In most instances, the range for the boys is greater than that of the girls.

2. The Measuring Instruments.

To identify the possible differences in the distribution of the mental abilities between lower and higher achievers, the SRA Primary Mental Abilities, Elementary, Ages 7-11, Form AH[5] was chosen, because of the grade placement and age range.

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3 George G. Thompson, Child Psychology, New York, Houghton Mifflin Co., 1952, p. 420.

4 Donald E. Super, Appraising Vocational Fitness, New York, Harper and Bros., 1949, p. 74-103.

5 L. L. Thurstone and Thelma G. Thurstone, SRA Primary Mental Abilities, Examiner Manual, Illinois, Science Research Associates, 1954, 21 p.

The battery is based on the primary mental abilities theory and research of L. L. Thurstone and T. G. Thurstone. It yields scores for five primary mental abilities, namely, verbal, space, reasoning, perception, and number. In addition, two total scores may be computed. The total score is the sum of the scores on the five tests. A total non-reading score is also available for pupils who have not learned to read well. The verbal meaning score is obtained by using both the word verbal test and the picture verbal test. The reasoning score is obtained by using the word grouping score and the figure grouping score. The five mental abilities are computed in percentiles but the two total scores may be computed in mental ages as well. The separate abilities are relatively independent of one another. In addition, the total score can be converted into an M.A. similar to that in other general intelligence tests.

The authors report the following reliabilities found by the use of the Kuder-Richardson formulas for a group of 505 pupils in the age range of 9-9.5 years: Words .942; Pictures .881; Verbal Meaning .950; Space .788; Word Grouping .876; Figure Grouping .794; Reasoning .893; Perception .808; Number .864; Total Non-Reading Score .938; Total Score .953 .

The SRA Junior Inventory, Form S,[6] which was developed by H. H. Remmers and Robert H. Bauernfeind, was chosen as a

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6 H. H. Remmers and Robert H. Bauernfeind, Manual for the SRA Junior Inventory, Form S, Illinois, Science Research Associates, 1957, 31 p.

means of comparing the social needs and problems which may be influencing the academic achievement of the two groups. This inventory was designed as a needs and problems checklist for use with boys and girls in grades four through eight. Written in the child's own language, it consists of 168 statements grouped into five broad areas: About Me and My School; About Me and My Home; About Myself; Getting Along With Other People; and Things in General.

In taking the inventory, the child checks each statement as a "big problem, a middle-sized problem, a little problem, or no problem for him."[7] He then reviews the items and encircles the three problems that he would most like to solve. The results of the inventory yield information which indicates both the kinds of problems experienced by the child and how important he feels these problems to be.

The norm group of 3,000 cases, stratified on three variables - grade, sex and geographical regions, resulted in the following reliability for each area respectively: School area .92; Home .88; Myself .81; People .89; General .87 .

Intercorrelations among areas range from .39 to .77 with a median value of .52 . The authors state that these coefficients are satisfactorily low to justify treating each area as an independent measure.

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7 Remmers and Bauernfeind, Op. Cit., p. 5.

### 3. Administration of Tests.

A group of lower achievers and higher achievers was chosen on the basis of the results of the California Test of Mental Maturity and the California Achievement Test Complete Battery, both of which were administered in January and February of 1961 to six hundred seven boys and girls in grades five and six. A month later, that is, in March of the same year, these same two groups were given the SRA Primary Mental Abilities Test, Form AH, and the SRA Junior Inventory, Form S. The latter tests were administered by the same teacher although the students were in five different schools.

### 4. Statistical Method.

The statistical analysis of the data was computed by utilizing the raw scores of the SRA Primary Mental Abilities Test and the SRA Junior Inventory to calculate the mean and the standard deviation for each factor and area concerned. Since the groups were small, the t test was applied for any significance of the differences between the means of the lower and higher achievers. The formula used was:

$$t = \frac{M_1 + M_2}{\sigma_{D_M}}$$

where $\sigma_{D_M}$ is equal to:

$$\sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2} .$$

To obtain the $\sigma_{M_1}$ and $\sigma_{M_2}$ the following formula was used:

$$\sigma_M = \frac{\sigma}{\sqrt{N - 1}} .$$

Results were calculated for the total group of lower and higher achievers in the fifth and sixth grades and then separately by sex and grade. This was done: 1) for each of the five factors and the sub-factors for the SRA Primary Mental Abilities Test to ascertain whether the distribution of mental abilities was the same for both groups, and 2) it was computed in three ways for each of the five areas of the SRA Junior Inventory - for the total number of important problems checked, for the total number of important and middle-sized problems checked, and for the total number of problems indicated. It was thought that in this manner, possible differences in the sources of the problems and needs of lower and higher achievers would become apparent.

# CHAPTER III

## PRESENTATION OF RESULTS

The goal of this study was to compare the performance of lower and higher achievers on tests in grades five and six within the 90-119 I.Q. range, for the purpose of ascertaining whether there existed a variability in mental abilities and in the needs and problems in five specific areas. The results obtained upon the administration of the SRA Primary Mental Abilities Test, Form AH, and the SRA Junior Inventory, Form S, are presented in this chapter with respect first, to the total groups and subsequently with respect to the sexes in each grade.

### 1. The Primary Mental Abilities Test.

The original scores of the tests for the five primary mental abilities were used to compute the mean and standard deviation, and the t test was applied for each factor respectively, that is, for the verbal, space, reasoning, perception and number. Since the verbal and reasoning factors were measured by two tests each, the mean and standard deviation were also computed for each subtest and the t test applied for significance. The following table shows the results of the Primary Mental Abilities Test for the total groups of lower and higher achievers.

Table II.- Significance of the Differences Between the Means of the Lower Achievers (L.A., N:92) and the Higher Achievers (H.A., N:106) on Each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A. | 51.64 | 9.53 | 1.590 |
| | H.A. | 53.68 | 8.31 | |
| Verbal Words | L.A. | 26.46 | 5.65 | 1.833 |
| | H.A. | 28.00 | 5.19 | |
| Verbal Pictures | L.A. | 25.26 | 8.17 | .427 |
| | H.A. | 25.67 | 4.52 | |
| Space | L.A. | 17.59 | 4.27 | 2.500* |
| | H.A. | 16.09 | 4.11 | |
| Reasoning | L.A. | 40.48 | 4.40 | .029 |
| | H.A. | 40.46 | 5.17 | |
| Word Grouping | L.A. | 20.18 | 3.66 | 1.390 |
| | H.A. | 20.88 | 3.33 | |
| Figure Grouping | L.A. | 20.18 | 2.94 | .465 |
| | H.A. | 19.57 | 2.86 | |
| Perception | L.A. | 26.01 | 6.41 | 1.235 |
| | H.A. | 27.06 | 5.32 | |
| Number | L.A. | 39.95 | 7.07 | 2.150* |
| | H.A. | 38.66 | 5.95 | |

* Significant at the 5% level.

The space factor discriminated most sharply between the two groups, the difference between means being significant at the 5% level of confidence and approaching the 1% level. The higher achievers showed greater capacity to visualize and think about objects in two or three dimensions which at the seven-to-eleven age level is important in art and handcraft activities.

The higher achievers also tended to be superior in their ability to work with numbers and to handle simple quantitative problems rapidly and accurately. A significant difference between the means of 2.15 was obtained which is at the 5% level of confidence.

The other factor tests revealed no significant differences between the means of the lower and higher achievers.

The procedure for gathering the data with respect to the results of the subgroups was similar to the above. To find the possible sex differences in the trait variability in the SRA Primary Mental Abilities Test, the original scores were used to compute the mean and standard deviation for the lower and higher achievers among the boys and girls in each grade respectively, and the t test applied. The results for each subgroup in grade five are presented in the following tables.

Table III.- Significance of the Differences Between the Means of the Lower Achieving Boys (L.A.B., N:34) and the Higher Achieving Boys (H.A.B., N:20) of Grade Five on Each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A.B. | 47.53 | 7.61 | 2.740* |
| | H.A.B. | 52.10 | 7.49 | |
| Verbal Words | L.A.B. | 23.94 | 5.47 | 1.207 |
| | H.A.B. | 26.25 | 7.24 | |
| Verbal Pictures | L.A.B. | 23.50 | 4.55 | 2.070 |
| | H.A.B. | 25.85 | 3.55 | |
| Space | L.A.B. | 16.94 | 4.89 | .111 |
| | H.A.B. | 16.80 | 4.08 | |
| Reasoning | L.A.B. | 38.56 | 5.63 | .135 |
| | H.A.B. | 38.75 | 4.66 | |
| Word Grouping | L.A.B. | 18.91 | 4.07 | .686 |
| | H.A.B. | 19.65 | 3.55 | |
| Figure Grouping | L.A.B. | 19.41 | 3.05 | .401 |
| | H.A.B. | 19.10 | 2.45 | |
| Perception | L.A.B. | 23.41 | 6.74 | .635 |
| | H.A.B. | 24.65 | 6.86 | |
| Number | L.A.B. | 31.68 | 6.28 | 1.330 |
| | H.A.B. | 34.05 | 6.15 | |

* Significant at 1% level.

Table IV.- Significance of the Differences Between the Means of the Lower Achieving Girls (L.A.G., N:7) and the Higher Achieving Girls (H.A.G., N:41) of Grade Five on Each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A.G. | 49.43 | 9.07 | |
| | H.A.G. | 50.70 | 8.27 | .321 |
| Verbal Words | L.A.G. | 24.86 | 4.68 | |
| | H.A.G. | 26.61 | 4.66 | .860 |
| Verbal Pictures | L.A.G. | 24.57 | 3.29 | |
| | H.A.G. | 24.10 | 4.51 | .316 |
| Space | L.A.G. | 17.43 | 3.29 | |
| | H.A.G. | 15.78 | 3.43 | 1.650 |
| Reasoning | L.A.G. | 43.43 | 4.98 | |
| | H.A.G. | 40.34 | 4.71 | 1.429 |
| Word Grouping | L.A.G. | 21.57 | 3.06 | |
| | H.A.G. | 21.17 | 2.64 | 1.308 |
| Figure Grouping | L.A.G. | 21.85 | 2.10 | |
| | H.A.G. | 19.17 | 2.91 | 2.750* |
| Perception | L.A.G. | 27.28 | 4.86 | |
| | H.A.G. | 26.66 | 4.55 | .239 |
| Number | L.A.G. | 36.71 | 5.28 | |
| | H.A.G. | 37.24 | 6.09 | .225 |

* Significant at the 1% level.

Table V.- Significance of the Differences Between the Means of the Lower Achievers (L.A., N:41) and the Higher Achievers (H.A., N:61) of Grade Five on each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A. | 47.85 | 7.91 | 2.060 |
| | H.A. | 51.16 | 8.05 | |
| Verbal Words | L.A. | 24.09 | 5.60 | 2.090 |
| | H.A. | 26.49 | 5.64 | |
| Verbal Pictures | L.A. | 23.68 | 4.53 | 1.090 |
| | H.A. | 24.67 | 4.30 | |
| Space | L.A. | 17.02 | 4.66 | 1.030 |
| | H.A. | 16.11 | 3.69 | |
| Reasoning | L.A. | 39.44 | 5.82 | .343 |
| | H.A. | 39.82 | 4.75 | |
| Word Grouping | L.A. | 19.36 | 4.04 | 1.746 |
| | H.A. | 20.67 | 3.06 | |
| Figure Grouping | L.A. | 19.83 | 3.04 | 1.130 |
| | H.A. | 19.15 | 2.77 | |
| Perception | L.A. | 24.00 | 6.62 | 1.600 |
| | H.A. | 26.00 | 5.50 | |
| Number | L.A. | 32.54 | 6.41 | 2.810* |
| | H.A. | 36.19 | 6.29 | |

* Significant at 1% level.

The difference between the means of the verbal factor for the lower and higher achieving boys was significant at the 1% level of confidence. Since the verbal score is obtained by the combination of the verbal word test and the verbal picture test, it is interesting to note that the t test of 2.07 for the verbal picture scores approaches significance at the 1% level of confidence.

The lower and higher achieving girls seem to show a discrepancy in the non-reading test of figure grouping which is a part score of the reasoning factor. The t test of 2.75 seems to indicate a significant difference between the means for the two groups, greater than at the 1% level.

As a group, regardless of sex, the number factor stands out with a significance of the difference between the means of 2.81, again at more than 1% level of confidence.

Tables six, seven, and eight which follow, present the results obtained from the administration and study of the results for the Primary Mental Abilities Test for the lower and higher achieving boys and girls, considered separately and as a group, in grade six.

The only significant difference between means was found for the space factor for the lower and higher achievers of the sixth grade. There is a slight indication of the possibility of some difference between the lower and higher achieving boys in reasoning and space factors and of the verbal and number factors between the lower and higher achieving girls.

Table VI.- Significance of the Differences Between the Means of the Lower Achieving Boys (L.A.B., N:33) and the Higher Achieving Boys (H.A.B., N:15) of Grade Six on each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A.B. | 54.85 | 9.99 | .242 |
| | H.A.B. | 54.26 | 6.18 | |
| Verbal Words | L.A.B. | 28.30 | 4.99 | .032 |
| | H.A.B. | 28.26 | 3.41 | |
| Verbal Pictures | L.A.B. | 26.84 | 4.57 | .651 |
| | H.A.B. | 26.00 | 3.81 | |
| Space | L.A.B. | 18.18 | 4.29 | 1.750 |
| | H.A.B. | 16.13 | 3.40 | |
| Reasoning | L.A.B. | 41.27 | 4.64 | 1.850 |
| | H.A.B. | 37.66 | 6.62 | |
| Word Grouping | L.A.B. | 20.97 | 3.12 | 1.821 |
| | H.A.B. | 18.73 | 4.02 | |
| Figure Grouping | L.A.B. | 20.27 | 2.65 | 1.264 |
| | H.A.B. | 18.93 | 3.57 | |
| Perception | L.A.B. | 27.30 | 6.09 | .061 |
| | H.A.B. | 27.20 | 4.49 | |
| Number | L.A.B. | 39.00 | 6.58 | .161 |
| | H.A.B. | 39.33 | 6.35 | |

Table VII.- Significance of the Differences Between the Means of the Lower Achieving Girls (L.A.G., N:18) and the Higher Achieving Girls (H.A.G., N:30) of Grade Six on each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A.G. | 54.39 | 8.93 | 1.610 |
| | H.A.G. | 58.50 | 7.54 | |
| Verbal Words | L.A.G. | 28.44 | 4.80 | 1.901 |
| | H.A.G. | 30.93 | 3.34 | |
| Verbal Pictures | L.A.G. | 25.94 | 5.03 | 1.067 |
| | H.A.G. | 27.53 | 4.65 | |
| Space | L.A.G. | 17.17 | 2.94 | .960 |
| | H.A.G. | 16.03 | 5.11 | |
| Reasoning | L.A.G. | 41.44 | 5.78 | 1.090 |
| | H.A.G. | 43.16 | 3.84 | |
| Word Grouping | L.A.G. | 20.61 | 3.27 | 1.862 |
| | H.A.G. | 22.36 | 2.73 | |
| Figure Grouping | L.A.G. | 20.83 | 3.05 | .081 |
| | H.A.G. | 20.76 | 2.39 | |
| Perception | L.A.G. | 28.05 | 5.13 | .640 |
| | H.A.G. | 29.13 | 3.48 | |
| Number | L.A.G. | 38.10 | 5.87 | 1.462 |
| | H.A.G. | 40.60 | 5.17 | |

Table VIII.- Significance of the Differences Between the Means of the Lower Achievers (L.A., N:51) and the Higher Achievers (H.A., N:45) of Grade Six on each of the Subtests of the SRA Primary Mental Abilities Test.

| Factor | Group | Mean | S.D. | t |
|---|---|---|---|---|
| Verbal | L.A. | 54.68 | 9.64 | |
| | H.A. | 57.09 | 7.39 | 1.360 |
| Verbal Words | L.A. | 28.35 | 4.93 | |
| | H.A. | 30.04 | 3.59 | 1.916 |
| Verbal Pictures | L.A. | 26.49 | 4.76 | |
| | H.A. | 27.02 | 4.45 | .558 |
| Space | L.A. | 18.04 | 3.87 | |
| | H.A. | 16.06 | 4.72 | 2.207* |
| Reasoning | L.A. | 41.31 | 5.07 | |
| | H.A. | 41.33 | 5.56 | .018 |
| Word Grouping | L.A. | 20.84 | 3.18 | |
| | H.A. | 21.15 | 3.64 | .438 |
| Figure Grouping | L.A. | 20.47 | 2.81 | |
| | H.A. | 20.15 | 2.89 | .552 |
| Perception | L.A. | 27.59 | 5.78 | |
| | H.A. | 28.49 | 4.71 | .833 |
| Number | L.A. | 38.68 | 6.35 | |
| | H.A. | 40.17 | 5.59 | 1.211 |

* Significant at the 5% level.

2. Results of the Junior Inventory.

The SRA Junior Inventory, Form S, was used as a measure of the personal problems and needs of the two groups in the following five major areas of the environment: About Me and My School; About Me and My Home; About Myself; Getting Along With Other People; and Things in General. The administrative procedure outlined in the manual was followed but the scoring system proposed was not adhered to since Siegel states that, "It is unlikely that it can be treated as a multiscored measuring instrument at the present time."[1] The authors suggest that a score of three be assigned to each important problem marked, two points for each middle-sized problem or need checked and one point for each little problem indicated. In this study, each problem marked, regardless of the size, was given the value of one point. Results for the total groups follow in Table IX.

No significant differences were found between the means for the two groups in any areas concerning their important, middle-sized or little problems and needs.

To investigate the possible differences between the lower and higher achievers of each sex in the needs and problems which may be affecting scholastic achievement in each

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1 Lawrence Siegel, "Test Reviews", in Journal of Counseling Psychology, Vol. 4, No. 4, issue of Winter 1957, p. 328-329, quoted by O.K. Buros, Ed., The Fifth Mental Measurements Yearbook, Highland Park, N.J., The Gryphon Press, 1959, p. 105.

Table IX.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in Five Areas in the SRA Junior Inventory in Grades Five and Six by Lower Achievers (L.A., N:92) and Higher Achievers (H.A., N:106).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A. | 6.15 | 5.09 | |
| | | H.A. | 4.90 | 4.35 | 1.840 |
| | Important & Middle | L.A. | 12.63 | 6.21 | |
| | | H.A. | 11.21 | 4.90 | 1.750 |
| | Total | L.A. | 20.01 | 6.59 | |
| | | H.A. | 18.65 | 6.43 | 1.450 |
| Home | Important | L.A. | 1.98 | 2.15 | |
| | | H.A. | 1.89 | 2.29 | .283 |
| | Important & Middle | L.A. | 4.28 | 3.23 | |
| | | H.A. | 3.79 | 3.25 | 1.060 |
| | Total | L.A. | 7.25 | 4.05 | |
| | | H.A. | 7.60 | 3.93 | .611 |
| Myself | Important | L.A. | 3.33 | 3.84 | |
| | | H.A. | 3.24 | 4.20 | .156 |
| | Important & Middle | L.A. | 8.29 | 6.77 | |
| | | H.A. | 8.47 | 6.66 | .187 |
| | Total | L.A. | 17.37 | 8.84 | |
| | | H.A. | 18.82 | 9.12 | 1.120 |
| People | Important | L.A. | 2.21 | 3.57 | |
| | | H.A. | 1.64 | 2.44 | 1.710 |
| | Important & Middle | L.A. | 5.59 | 5.65 | |
| | | H.A. | 5.17 | 5.40 | .530 |
| | Total | L.A. | 12.12 | 7.86 | |
| | | H.A. | 12.33 | 8.04 | .185 |
| General | Important | L.A. | 3.92 | 3.89 | |
| | | H.A. | 3.58 | 3.62 | .630 |
| | Important & Middle | L.A. | 8.98 | 6.14 | |
| | | H.A. | 8.54 | 5.78 | .520 |
| | Total | L.A. | 13.88 | 6.74 | |
| | | H.A. | 14.75 | 6.21 | .940 |

Table X.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in Grade Five by the Lower Achieving Boys (L.A.B., N:34) and the Higher Achieving Boys (H.A.B., N:20).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A.B. | 7.50 | 5.46 | |
| | | H.A.B. | 5.85 | 4.55 | 1.196 |
| | Important & Middle | L.A.B. | 14.40 | 6.32 | |
| | | H.A.B. | 12.35 | 4.17 | 1.934 |
| | Total | L.A.B. | 21.20 | 7.70 | |
| | | H.A.B. | 19.75 | 5.36 | .801 |
| Home | Important | L.A.B. | 2.20 | 2.44 | |
| | | H.A.B. | 2.25 | 2.05 | .079 |
| | Important & Middle | L.A.B. | 4.00 | 2.93 | |
| | | H.A.B. | 3.95 | 3.32 | .055 |
| | Total | L.A.B. | 7.20 | 2.26 | |
| | | H.A.B. | 7.40 | 4.04 | .199 |
| Myself | Important | L.A.B. | 2.90 | 3.61 | |
| | | H.A.B. | 2.60 | 3.28 | .306 |
| | Important & Middle | L.A.B. | 8.00 | 5.58 | |
| | | H.A.B. | 7.25 | 6.26 | .434 |
| | Total | L.A.B. | 17.00 | 8.48 | |
| | | H.A.B. | 17.35 | 9.85 | 1.282 |
| People | Important | L.A.B. | 2.50 | 3.89 | |
| | | H.A.B. | 1.40 | 2.15 | 1.325 |
| | Important & Middle | L.A.B. | 6.20 | 5.35 | |
| | | H.A.B. | 5.30 | 4.58 | .643 |
| | Total | L.A.B. | 12.00 | 6.98 | |
| | | H.A.B. | 12.35 | 8.41 | .154 |
| General | Important | L.A.B. | 3.90 | 3.60 | |
| | | H.A.B. | 3.45 | 3.20 | .466 |
| | Important & Middle | L.A.B. | 8.30 | 5.36 | |
| | | H.A.B. | 7.55 | 5.75 | .466 |
| | Total | L.A.B. | 13.00 | 4.51 | |
| | | H.A.B. | 13.20 | 6.89 | .114 |

Table XI.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in grade Five by the Lower Achieving Girls (L.A.G., N:7) and the Higher Achieving Girls (H.A.G., N:41).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A.G. | 9.00 | 5.29 | |
| | | H.A.G. | 5.12 | 4.22 | 1.718 |
| | Important & Middle | L.A.G. | 18.00 | 3.80 | |
| | | H.A.G. | 10.83 | 5.16 | 4.097* |
| | Total | L.A.G. | 21.20 | 7.70 | |
| | | H.A.G. | 18.97 | 5.26 | 2.535 |
| Home | Important | L.A.G. | 3.00 | 2.25 | |
| | | H.A.G. | 1.70 | 1.86 | 1.348 |
| | Important & Middle | L.A.G. | 6.00 | 2.62 | |
| | | H.A.G. | 4.00 | 2.84 | 1.724 |
| | Total | L.A.G. | 10.50 | 2.38 | |
| | | H.A.G. | 8.02 | 3.34 | 2.242 |
| Myself | Important | L.A.G. | 5.00 | 4.58 | |
| | | H.A.G. | 3.85 | 4.76 | .572 |
| | Important & Middle | L.A.G. | 12.00 | 6.46 | |
| | | H.A.G. | 9.90 | 6.49 | .742 |
| | Total | L.A.G. | 23.00 | 5.97 | |
| | | H.A.G. | 20.63 | 8.25 | .865 |
| People | Important | L.A.G. | 3.00 | 2.50 | |
| | | H.A.G. | 2.05 | 1.68 | .760 |
| | Important & Middle | L.A.G. | 9.00 | 6.13 | |
| | | H.A.G. | 5.83 | 5.36 | 1.201 |
| | Total | L.A.G. | 18.00 | 6.29 | |
| | | H.A.G. | 13.50 | 7.61 | 1.590 |
| General | Important | L.A.G. | 8.00 | 1.15 | |
| | | H.A.G. | 3.92 | 3.33 | 5.787* |
| | Important & Middle | L.A.G. | 17.00 | 4.15 | |
| | | H.A.G. | 9.02 | 5.20 | 4.245* |
| | Total | L.A.G. | 22.00 | 4.71 | |
| | | H.A.G. | 15.65 | 5.45 | 3.014* |

* Significant at level of 1% or more.

Table XII.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in Grade Five by the Lower Achievers (L.A., N:41) and the Higher Achievers (H.A., N:61).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A. | 7.73 | 5.44 | 2.324 |
| | | H.A. | 5.36 | 4.35 | |
| | Important & Middle | L.A. | 15.00 | 6.11 | 3.191* |
| | | H.A. | 11.33 | 4.91 | |
| | Total | L.A. | 21.61 | 7.20 | 1.789 |
| | | H.A. | 19.23 | 5.30 | |
| Home | Important | L.A. | 2.46 | 2.44 | 1.224 |
| | | H.A. | 1.88 | 2.14 | |
| | Important & Middle | L.A. | 4.46 | 2.96 | .807 |
| | | H.A. | 3.97 | 3.01 | |
| | Total | L.A. | 7.78 | 3.74 | .040 |
| | | H.A. | 7.75 | 3.61 | |
| Myself | Important | L.A. | 3.24 | 3.86 | .241 |
| | | H.A. | 3.44 | 4.37 | |
| | Important & Middle | L.A. | 8.85 | 5.92 | .143 |
| | | H.A. | 9.03 | 6.54 | |
| | Total | L.A. | 18.22 | 8.36 | .788 |
| | | H.A. | 19.56 | 8.94 | |
| People | Important | L.A. | 2.73 | 3.72 | 1.399 |
| | | H.A. | 1.84 | 1.87 | |
| | Important & Middle | L.A. | 6.70 | 5.59 | .920 |
| | | H.A. | 5.66 | 5.12 | |
| | Total | L.A. | 12.95 | 7.20 | .105 |
| | | H.A. | 13.11 | 7.90 | |
| General | Important | L.A. | 4.49 | 4.11 | .905 |
| | | H.A. | 3.75 | 3.85 | |
| | Important & Middle | L.A. | 9.92 | 6.19 | 1.147 |
| | | H.A. | 8.45 | 5.43 | |
| | Total | L.A. | 14.68 | 6.19 | .136 |
| | | H.A. | 14.85 | 6.07 | |

* Significant at 1%.

grade respectively, data from the results of the inventories was computed for each area by grade and sex subgroups. The results for grade five are presented in tables ten, eleven and twelve. The results for grade six are listed in tables thirteen, fourteen and fifteen. The original s cores were used to compute the mean and standard deviation. The t test was applied to the means of each subgroup.

The only area in which the difference between the means approaches significance at the 5% level is the "About Me and My School" area, which seems to be the source of needs and problems especially for the lower achieving boys of grade five. These include such factors as attitudes towards school subjects, likes and dislikes of subject matter, perceived relationship with teachers, and felt needs unfulfilled by the school.

The two areas of "About Me and My School" and "Things in General" seem to give rise to most of the problems and needs of the girls. The school area shows that the lower achieving girls have more important and middle-sized problems and needs than the higher achieving girls, the difference between means being significant at greater than 1% level. The total number of their problems in this area showed a significant difference between the means at the 5% level of confidence.

The lower achieving girls indicated more problems also in the "Things in General" area as compared to the number

checked by the higher achieving girls. Considering the total number of problems, that is, the important, middle-sized and little problems, the lower achieving girls had a mean of twenty-two while the mean for the higher achievers was 15.65 The application of the t test for the two types of problems and the total number showed a significant difference between the means to be greater than at the 1% level of confidence. Items in this area consist of statements dealing with children's interests and needs in a variety of life areas, for example, hobbies, manual and social skills, recreational problems and the kinds of things children of this age wonder about.

The "About Me and My Home" area, which contains items covering the child's relations with the family and home, shows a significant difference between the means at the 5% level of confidence. Again, the lower achieving girls indicated more problems and needs as compared to those of the higher achievers in this area.

Table XII suggests that the "About Me and My School" area is a source of more important and middle-sized problems and needs for the lower achievers of grade five. The significant difference between the means is 3.191 . The other areas do not seem to show a discrepancy between the needs of lower and higher achievers.

The following tables present the data for the sixth grade, considered separately for sex and for the total group.

Table XIII.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in Grade Six by the Lower Achieving Boys (L.A.B., N:33) and the Higher Achieving Boys (H.A.B., N:15).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A.B. | 5.21 | 4.21 | .388 |
| | | H.A.B. | 4.53 | 5.96 | |
| | Important & Middle | L.A.B. | 11.85 | 4.87 | 1.126 |
| | | H.A.B. | 14.00 | 6.40 | |
| | Total | L.A.B. | 20.03 | 5.05 | .601 |
| | | H.A.B. | 21.13 | 5.99 | |
| Home | Important | L.A.B. | 1.82 | 1.98 | .863 |
| | | H.A.B. | 2.60 | 3.12 | |
| | Important & Middle | L.A.B. | 4.39 | 3.52 | .049 |
| | | H.A.B. | 4.33 | 3.99 | |
| | Total | L.A.B. | 6.91 | 4.29 | 1.399 |
| | | H.A.B. | 8.60 | 3.52 | |
| Myself | Important | L.A.B. | 3.51 | 3.00 | .589 |
| | | H.A.B. | 4.40 | 5.31 | |
| | Important & Middle | L.A.B. | 7.88 | 7.66 | .706 |
| | | H.A.B. | 9.80 | 8.86 | |
| | Total | L.A.B. | 17.00 | 8.38 | 1.504 |
| | | H.A.B. | 21.00 | 8.30 | |
| People | Important | L.A.B. | 1.82 | 4.15 | .029 |
| | | H.A.B. | 1.86 | 4.46 | |
| | Important & Middle | L.A.B. | 5.39 | 6.32 | .075 |
| | | H.A.B. | 5.55 | 6.79 | |
| | Total | L.A.B. | 12.48 | 7.78 | .817 |
| | | H.A.B. | 14.20 | 6.35 | |
| General | Important | L.A.B. | 3.63 | 3.52 | .751 |
| | | H.A.B. | 4.46 | 3.42 | |
| | Important & Middle | L.A.B. | 8.63 | 5.82 | 1.154 |
| | | H.A.B. | 10.80 | 5.91 | |
| | Total | L.A.B. | 13.97 | 6.40 | 1.645 |
| | | H.A.B. | 16.80 | 4.86 | |

Table XIV.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in Grade Six by the Lower Achieving Girls (L.A.G., N:18) and the Higher Achieving Girls (H.A.G., N:30).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A.G. | 4.27 | 4.20 | .120 |
| | | H.A.G. | 4.13 | 3.12 | |
| | Important & Middle | L.A.G. | 8.66 | 5.90 | .000 |
| | | H.A.G. | 8.66 | 4.91 | |
| | Total | L.A.G. | 16.33 | 5.76 | .050 |
| | | H.A.G. | 16.23 | 7.85 | |
| Home | Important | L.A.G. | 1.16 | 1.12 | .807 |
| | | H.A.G. | 1.53 | 1.99 | |
| | Important & Middle | L.A.G. | 3.66 | 3.00 | .532 |
| | | H.A.G. | 3.16 | 3.20 | |
| | Total | L.A.G. | 6.66 | 3.92 | .110 |
| | | H.A.G. | 6.80 | 4.57 | |
| Myself | Important | L.A.G. | 3.16 | 2.54 | 1.150 |
| | | H.A.G. | 2.23 | 2.78 | |
| | Important & Middle | L.A.G. | 7.77 | 6.72 | .590 |
| | | H.A.G. | 6.66 | 5.09 | |
| | Total | L.A.G. | 16.16 | 9.97 | .023 |
| | | H.A.G. | 16.23 | 9.31 | |
| People | Important | L.A.G. | 0.72 | 1.10 | .938 |
| | | H.A.G. | 1.13 | 1.87 | |
| | Important & Middle | L.A.G. | 3.38 | 3.22 | .512 |
| | | H.A.G. | 4.00 | 4.98 | |
| | Total | L.A.G. | 9.55 | 8.45 | .096 |
| | | H.A.G. | 9.80 | 8.51 | |
| General | Important | L.A.G. | 3.16 | 3.59 | .349 |
| | | H.A.G. | 2.80 | 3.04 | |
| | Important & Middle | L.A.G. | 7.42 | 5.89 | .011 |
| | | H.A.G. | 7.40 | 6.05 | |
| | Total | L.A.G. | 11.88 | 6.22 | .704 |
| | | H.A.G. | 13.20 | 7.41 | |

Table XV.- Significance of the Differences Between the Means of the Number of Problems of Different Types Checked in the SRA Junior Inventory in Grade Six by the Lower Achievers (L.A., N:51) and the Higher Achievers (H.A., N:45).

| Area | Problem | Group | Mean | S.D. | t |
|---|---|---|---|---|---|
| School | Important | L.A. | 4.88 | 4.23 | |
| | | H.A. | 4.27 | 4.29 | .693 |
| | Important & Middle | L.A. | 10.73 | 5.47 | |
| | | H.A. | 11.04 | 4.88 | .292 |
| | Total | L.A. | 18.73 | 5.60 | |
| | | H.A. | 17.87 | 7.64 | .618 |
| Home | Important | L.A. | 1.59 | 1.75 | |
| | | H.A. | 1.89 | 2.48 | .662 |
| | Important & Middle | L.A. | 4.14 | 3.36 | |
| | | H.A. | 3.55 | 3.54 | .826 |
| | Total | L.A. | 6.82 | 4.16 | |
| | | H.A. | 7.40 | 4.33 | .659 |
| Myself | Important | L.A. | 3.37 | 3.75 | |
| | | H.A. | 2.95 | 3.95 | .529 |
| | Important & Middle | L.A. | 7.84 | 7.34 | |
| | | H.A. | 7.71 | 6.76 | .896 |
| | Total | L.A. | 16.69 | 8.98 | |
| | | H.A. | 17.82 | 9.26 | .601 |
| People | Important | L.A. | 1.78 | 3.30 | |
| | | H.A. | 1.38 | 3.02 | .615 |
| | Important & Middle | L.A. | 4.69 | 5.42 | |
| | | H.A. | 4.51 | 5.69 | .156 |
| | Total | L.A. | 10.75 | 8.14 | |
| | | H.A. | 11.27 | 8.11 | .309 |
| General | Important | L.A. | 3.47 | 3.55 | |
| | | H.A. | 3.35 | 3.27 | .170 |
| | Important & Middle | L.A. | 8.22 | 5.87 | |
| | | H.A. | 8.53 | 6.22 | .248 |
| | Total | L.A. | 13.24 | 6.45 | |
| | | H.A. | 14.62 | 6.40 | 1.030 |

The data for the lower and higher achievers in the sixth grade, boys and girls considered separately and as a total group, seems to indicate that both groups have similar problems and needs as measured by the SRA Junior Inventory. No significant differences between the means for any areas were found.

From the results obtained with the instruments used for this study, it would seem that there is some possibility of a difference in the use of mental abilities by the lower and higher achievers in grades five and six. The space and number factors for the two groups, grades combined, resulted in a significant difference between the means at the 5% level of confidence. Further, in analyzing the subgroups by sex and grade, the verbal factor seems to discriminate between the lower and higher achieving fifth grade boys, while the lower and higher achieving girls differ in the non-reading reasoning factor. The only significant difference between means which was found in the sixth grade was for the space factor which seemed to indicate some dissimilarity between the lower and higher achievers.

The results of the SRA Junior Inventory point to some variability concerning the nature of the needs and problems encountered by the boys and girls in grade five. The lower achieving boys indicated the school area as a source of most problems, while the lower achieving girls appeared to find the school area and things in general as the origins of their

needs, with also a strong indication of the "About Me and My Home" area as giving rise to important needs. Both groups of the sixth grade have similar problems in all areas. As a group, with the lower achievers of both grades and higher achievers of both grades combined, there was no significant difference between the means for any area studied.

# CHAPTER IV

## DISCUSSION OF THE RESULTS

There is no doubt in the minds of educators that "hidden" lower achievers are found in the ordinary classroom, who, though not failing according to school standards, are nevertheless functioning below individual capacity. In this study, of the six hundred seven pupils tested, ninety two were found to be currently performing five months or more below their capacity when the mental age grade-placement was compared to the achievement battery grade-placement for each individual. One hundred six pupils were functioning five months or more above their ability.

### 1. The Pattern of Mental Abilities.

The SRA Primary Mental Abilities Test was given to the two groups of lower and higher achievers in the fifth and sixth grades for the purpose of identifying the possible differences in the distribution of their mental abilities. The trends which could be gleaned from the data are few.

The fact that unevenness in achievement is not too great for the normal students seems to be upheld in this study. Gray[1] found a greater variability in scholastic proficiency in the lower intelligence group than in the middle

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1 Gray, Op. Cit., p. 201-210.

or higher groups as did Woodrow[2] when he found that the bright and dull pupils showed a greater variability than did the normal. In this study, no sharp discrepancies were found between the lower and higher achievers of the average group studied, although there was a tendency towards some difference in the use of the space and number factors.

When Commins[3] compared the variability in achievement in bright, normal and dull fifth grade pupils, he found a greater unevenness among boys. This fact seems to be upheld in this study of fifth and sixth graders where seventy three percent of the boys were in the lower achieving group whereas the girls comprised only twenty seven percent of the group.

The performance of both groups on the test of mental abilities reveals a tendency towards some discrepancies regarding several factors although the patterns of intelligence do not differ significantly for the lower and higher achievers.

Hobson[4] and Wesman[5] substantiate the fact that boys and girls, although not differing significantly in intelligence as measured by intelligence tests, do differ somewhat in specific abilities. Ruszel[6] claims in his study, that even

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2 Woodrow, Op. Cit., p. 289-302.

3 Commins, Op. Cit., p. 557-561.

4 Hobson, Op. Cit., p. 126-132.

5 Wesman, Op. Cit., p. 223-229.

6 Ruszel, Op. Cit., 70 p.

though both sexes give evidence of possessing the same primary abilities, they may not possess them to the same degree and their use may be quite different in test performance.

Although this study was limited to grades five and six and to the I.Q. range 90-119, it seems to point to similar trends.

The data computed for grade five shows a significant difference between the means for the verbal factor for the two groups of boys. The lower and higher achieving girls differ significantly between the means for the figure-grouping, or the non-reading part of the reasoning factor. As a group, the higher achievers seem to have a greater ability in performing numerical tasks, the significance of the difference between the means for the two groups being 2.81 at the 1% level of confidence.

The only factor in the sixth grade which seems to show a discrepancy between the lower and higher achievers, is the space factor. The other factors give little evidence of variability between the means for the two groups although there is a noticeable tendency for the higher achieving boys to do better in space and reasoning and the higher achieving girls to excel in the verbal factor, especially the verbal word task which includes comprehension.

It is interesting to note that although there is no agreement among the results of various research studies as to the influence of age on the organization of mental abilities,

this study seems to favor the fact that specific abilities are present and that there seems to be a difference in the degree to which they are used by the lower and higher achievers even at the level of nine and ten years of age.

The results for the total group indicate that space and number factors seem to discriminate most sharply between the lower and higher achievers of the fifth and sixth grades. The higher achievers tend to be superior in their ability to visualize objects in flat space and in solid space in two or three dimensions, and they excel in their ability to manipulate quantitative problems rapidly and accurately. The very fact that there is a significant difference between the means for these two factors seems to point to the presence of specific abilities. Asch[7] and others have reported that their studies have led them to assume that there is a loss of generality of mental ability from ages nine to twelve and an increase of specific abilities with an increase in age.

That the space factor seemed to be a weakness in the lower achievers is not surprising, for perception of space is not concerned with the reality of space but with the manner in which the child recognizes it. The data presented by the sense contribute greatly to the perception of space and are inextricably woven into various experiences. Lacking this ability, the pupil is handicapped in the learning process.

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7 Asch, Op. Cit., 30 p.

Although it seems to be important in many occupations such as mechanical work, engineering, drafting, and science, and although many of the subjects in the regular school curriculum have very little dependence on this factor, it is nevertheless, true that at the age level of seven-to-eleven, this factor is important in art, handcraft and other creative activities as Katherine D'Evelyn so clearly states,

> The opportunity for creative thinking and creative expression of all kinds is a continuing need for the pre-adolescent. If the significance of creativity were understood, schools would never debate its place in school curricula. It is only through creative acts that the individual is truly himself, and it is only as he is himself that he remains emotionally healthy. No intention is implied here to overlook the necessity for gathering academic skills and getting a background of facts from history, literature, science, and mathematics. One does not become creative in a vacuum or void. Experiences and learning nourish creativity.[8]

Educators have also raised the question whether much more of this kind of thinking could be introduced into the teaching in many fields if teachers had more ability or better training in this area. Caswell seems to be of the same opinion,

> Intellectually, children of this age tend to be greatly concerned with their immediate surroundings, and their curiosity is directed primarily at action and utility. Formal descriptions and definitions function but little in their thinking and action. The period is characterized by (1) a specialization and differentiation in interests, (2) a differentiation between work and play, (3) uninhibited creative

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8 Katherine D'Evelyn, Meeting Children's Emotional Needs, Englewood Cliffs, N.J., Prentice-Hall, Inc., 1957, p. 27.

> work, and (4) distinctly more mature intellectual ability...If the child of this period is accorded freedom of expression unencumbered by adult standards he will do a great deal of creative work. Stories, poems, and drawings may appear spontaneously from his pencil.[9]

Thus the development of the use of this spatial ability in the lower achievers cannot be neglected.

Of significance also, is the fact that the lower achievers showed a weakness in the number factor, the difference between the means being 2.81 . Brotherton, Read and Pratt[10] found in their study of children's number concepts that after testing them at three grade levels: second and third, sixth and seventh, and tenth and eleventh, a reliable increase was noted in precision in the use of these concepts from grades two and three to grades six and seven. However, there was little increase noted from grades six and seven to grades ten and eleven, indicating that these concepts are established with a relatively high degree of precision at the sixth and seventh grade levels. Thus this weakness of the lower achievers cannot be overlooked but opportunities for stimulating the growth and clarification of number concepts must be provided if the child is to perform to his capacity.

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9 Caswell, Op. Cit., p. 116-117.

10 D.A. Brotherton, J.M. Read, and K.C. Pratt, "Indeterminate Number Concepts #II. Application by Children to Determine Number Concepts", in Journal of Genetic Psychology, Vol. 73, 1948, p. 209-236.

2. Problems and Needs Affecting Achievement.

The SRA Junior Inventory was administered to both the lower and higher achievers of the fifth and sixth grades in an attempt to tap some of the possible sources of adverse influence from five environmental areas on academic achievement. More specifically, this inventory was used to determine whether both groups were equally adjusted to their environment or whether they differed significantly in the types of problems and needs which they experienced in the areas of school, home, myself, people, and things in general, as measured by this inventory.

On the fifth grade level, it was interesting to note that the lower achieving girls differed quite noticeably from the higher achieving girls in the "Things in General" area. The inventory includes twenty-nine statements in this section, which deal with the children's interests and needs in a variety of areas. Hobbies, manual and social skills, recreational problems, and the need for information of various types are included with a broad coverage of the kinds of things which children of this age wonder about and the types of skills they wish to learn. That this area should be the source of problems is not surprising when the developmental aspect of the child of nine to eleven is taken into consideration. Making steady progress in physical development and becoming less susceptible to fatigue, the child seeks to engage in activities

involving the use of finer motor performance over longer periods of time. A specialization and differentiation in interests results as does the differentiation between work and play and the desire for creativity. Interests are expressed through various channels such as: collection of stamps, pins, coins, and the like; adventure stories are indulged in; and activities related to home and school life assume a greater importance. There is a desire to contribute something real to the family, class or community. Under good guidance, favorable conditions can be provided to satisfy these needs for the full growth of the individual child according to his capacity.

These two groups, that is, the lower achieving boys and the lower achieving girls, also indicated more needs in the "About Me and My School" area than did the boys and girls in the higher achieving groups. In the inventory, this section consists of thirty-nine items dealing with attitudes toward school and school activities, the degree of satisfaction with achievement, the child's perceived relationship with teachers, the amount of difficulty experienced with tests and classroom recitations, the degree of liking specific school subjects, and felt needs unfulfilled by the school. Again, with the noticeable and significant changes which occur developmentally in the social relationship of the child of this age, needs and problems in this area can be expected. Although exceedingly sensitive to the judgments of his peers

and fearful of going counter to their standards and practices, he, nevertheless, looks for experiences of success and the approval of adults. Learning is stimulated and interests developed out of satisfying activities provided by the school.

The higher achieving girls indicated fewer needs in the "About Me and My Home" area than did the lower achieving girls. This section of the inventory covers the child's relations with his family, the general atmosphere of his home, and wishes related to his home environment. It gives a better understanding of the child's feelings in this important area of his life, for although at this age, the family circle and adults are looked to much less than formerly for standards and advice, yet, at no time throughout the progress from dependence to independence is his need for the sympathy and security of the home totally eclipsed. He vacillates from approval of adults to the regard of his peers. Zachry[11] suggest that wisdom in handling these children at this age may result in diminishing the turbulence of adolescence.

Thus, in general, although the problems of the lower achievers did not differ too greatly from those reported by the higher achievers, they did specify the school area as the main source of needs and problems. Next in order would be those related to "Things in General" and the "About Me and My Home" areas. In examining each subgroup separately, all five

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11 C.B. Zachry, "Later Childhood - Some Questions for Research", in Progressive Education, Vol. 15, Nov. 1938, p. 522-528.

areas fall within the same order of importance in each group with respect to the total number of problems. With the exception of the higher achieving girls in the fifth grade who rank the "About Myself" area as the first and the "About Me and My School" area as the second source of their problems and needs, the other seven subgroups of both grades, rank the areas as the origin of their difficulties in the following order: 1) school, 2) myself, 3) things in general, 4) people, and 5) home. The order is not the same when important problems are considered. Here school problems take precedence, then the "Things in General" and "About Myself" areas.

Five subgroups rank the home as the fourth important source of their needs and people as the last source. Three subgroups reverse the latter order, that is, the people area is the fourth in order and the home area is last. A closer study of the important problems, points to the fact that in each area, three or four problems stand out as common sources of difficulties for all eight subgroups. In the school area, the following items are listed most frequently, "I don't like to write stories or essays", "I wish I could get better grades in school", and "I wish I were smarter in school". However, twice as many lower achievers than higher achievers listed the following items as their greatest problems, "I want to learn how to spell better", "Most teachers don't understand me", and "I need help with my school work".

In the "Things in General" area, the following problems were indicated most frequently, "I would like to know what I'm going to be when I grow up", "I wonder if I should plan to go to college", and "I wish I could have a pet animal". Again, the greatest discrepancy between the lower and higher achievers was on items, "I want to learn how to work with machines", and "I wish I could talk to someone about my problems".

In the area "About Myself" the difficulties seemed to be "I bite my finger-nails", "I need to learn to control my temper", and "I wish I were nicer looking". More lower achievers considered their serious problems as, "I get lots of head-aches", and "I am not as strong as I would like to be". Most of these serious problems seem to center around the self-picture.

The child's concept of himself as an individual is most closely related to personal adjustment and happiness. Various factors are included, such as, fears, worries, feelings of personal adequacy, and the child's attitudes toward his own social behavior and physical appearance. Chickering[12] indicates that academic achievement varies with respect to the relationship between actual self-perception and ideal self-perception, and that as the discrepancy increases, achievement in relation to expectancy decreases. Cohen[13] and Diller[14]

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12 Chickering, Op. Cit., 81 p.

13 Cohen, Op. Cit., p. 84-86.

14 Diller, Op. Cit., p. 1-12.

substantiate this fact that as the self-concept becomes more favorable, learning ability improves. Katherine D'Evelyn says that:

> The pre-adolescent is strengthening his self-concept and needs wise guidance from his teachers in building an image of himself as a person with inner strength and self-confidence - one who is accepted and respected by others.[15]

Further research in this area would offer profitable and practical information to aid the teachers not only in recognizing pupils with a poor self-concept, but also in determining whether it is the cause of or the result of lower achievement.

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15 D'Evelyn, Op. Cit., p. 29.

# SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the problem of possible variation in the distribution of mental abilities and the level of adjustment in certain environmental areas of lower and higher achievers within the 90-119 I.Q. range in grades five and six. The criteria used as the basis for the selection of the two groups were the results of the California Short-Form Test of Mental Maturity and the California Achievement Tests Complete Battery. The grade-placements of these were then compared for each student. With a discrepancy of the achievement grade-placement of five months or more either above or below the mental age grade-placement, the pupils were considered as lower or higher achievers, although none were failing by the school standards. This method resulted in ninety two lower achievers and one hundred six higher achievers from a total group of six hundred seven fifth and sixth graders tested for the purpose.

The two groups were then compared on their performance on the SRA Primary Mental Abilities Test and on the SRA Junior Inventory, to discover if the same mental abilities were operative in intellectual tasks and if both experienced similar needs and problems in their social environment which may have affected their academic achievement.

In analyzing the results of the data obtained in this study, it has been found that the value of the t test in most

cases falls within the chance expectancy limits. The importance of the small sample cannot be dismissed. Had a larger sample been used, the chances of obtaining a significant difference would have been increased. However, several tests of significance do seem to indicate a t endency of variance both in the mental abilities and in the areas of adjustment.

Especially is this true of the fifth grade lower and higher achievers who differed in their performance on the verbal, reasoning and number factors with a statistical significant difference between the means at the 1% level of confidence. These same two groups differed similarly in reporting their needs and problems with a difference between the means again at the 1% level of confidence in the school area. The lower achieving girls also indicated the "Things in General" area as a source of problems with a significant difference between the means well above the 1% level of confidence.

Although the sixth graders did not differ in the distribution of their mental abilities, the total group did show a significant difference between the means at the 5% level of confidence for the space factor. They revealed no difference in the types of problems and needs which they experienced.

As a total group, grades five and six combined, they differed in their performance on the mental abilities test by a significant difference between the means at the 5% level in the space and number factors. Their means did not differ

significantly for the needs and problems as measured by the instrument used. However, it was interesting to observe that each group of lower and higher achievers in both grades indicated their most important problems in the same areas according to the same rank, that is, most of the problems were found first in the school area, then in the "Things in General" area and lastly in the "About Myself" area. Considering the total number of problems and needs, each subgroup ranked the same areas in the identical order, that is, school, myself (except the higher achieving girls of grade five), things in general, other people, and home.

The foregoing findings indicated by the data of this study seem to point to a partial acceptance of the null hypothesis proposed at the beginning of this investigation, namely that: There is no statistical significant difference between the performance on the SRA Primary Mental Abilities Test, Form AH, and on the SRA Junior Inventory, Form S, of children within the I.Q. range of 90-119, in grades five and six, who achieve to their capacity and those who operate below their appropriate level.

On the basis of the present study and others which have been presented in the review of literature, it is evident that the variability in the distribution of mental abilities within the average group is very small. However, there seems to be some evidence in favor of the assumption that although the same abilities are possessed by both lower and higher

achievers, they are not used to the same degree. This may be the result of lack of motivation to learn due to the poor self-picture possessed by the lower achievers, their unsatisfied needs and problems in school, and their desires for acquiring various hobbies and skills.

Further investigation in these areas would be worthwhile but with a larger sample population which would cancel out some of the errors resulting from a small sampling and at the same time might point to findings which the smaller sample failed to reveal.

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APPENDIX 1

ABSTRACT OF

[redacted] Lower and Higher Achievers in Grades Five and Six on Certain Intellectual and Social Factors[1]

This study investigated the possible variability of mental abilities and the level of adjustment in certain areas between the lower and higher achievers within the I.Q. range of 90-119 . [redacted]

The results obtained from the administration of the SRA Primary Mental Abilities Test and the SRA Junior Inventory seem to indicate that there is some possibility of a difference between the groups in the use of mental abilities. The space and number factors resulted in a significant difference between the means at the five percent level of confidence. In analyzing the subgroups by sex and grade, the verbal factor seemed to discriminate between the lower and higher achieving fifth grade boys, while the lower and higher achieving fifth grade girls differed in the reasoning factor.

Both groups found the "School" and "Things in General" areas as the origins of their important problems. A study

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1 Sister Mary Francis, O.S.F., master's thesis presented to the School of Psychology and Education of the University of Ottawa, Ontario, July, 1961, x-73 p.

of individual items in the inventory seems to indicate that the lower achievers have a poor self-concept.