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Do academically gifted learners 7-11 in the Midwest School District achieve proportionate to their respective abilities?

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DO ACADEMICALLY GIFTED LEARNERS 7-11 IN THE MIDWEST SCHOOL DISTRICT ACHIEVE PROPORTIONATE TO THEIR RESPECTIVE ABILITIES?

A Field Project

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by

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FIELD PROJECT ACCEPTANCE

Accepted for the Graduate Faculty, University of Nebraska, in partial fulfillment of the requirements for the degree Specialist in Education, University of Nebraska at Omaha.

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Chapter One

Gifted children are special. Their potential, properly developed, is the clay from which teachers mold many of the leaders of tomorrow. In order for talented and gifted students to reach self-actualization the following elements must be present in their educational environment:

1. Early identification is vital.

2. Measurement of ability and achievement should be comprehensive and on-going.

3. Programs must be available to meet individual needs.

Identification of gifted learners is traditionally accomplished through a system of intelligence testing. Instruments such as the Stanford-Binet Intelligence Scale, an individual test of mental activities, and the Otis-Lennon Mental Ability Test, a group intelligence examination, are among those used to determine an intelligence quotient. Along with other indicators that might be used, those children who attain a district stipulated score are then labeled "gifted." Although fluctuation of intelligence quotients has been proven (Sontag, Baker & Nelson, 1958; Kagan & Moss, 1962), the score remains one of the strongest measures of intellectual giftedness (Gallagher, 1979).

Once the student has been identified and placed (where programs are available), standard achievement tests are used to assess the student's level of capability in content areas. All content rating should be based on age or grade expectation (Clark, 1979). Successful accomplishment is generally measured by examining whether the predicted potential of the student has been achieved. By periodically examining the distance between

intelligence quotient and standardized test scores at respective grade levels, measurement of growth can be determined.

A synopsis of instruments commonly used for measuring intelligence and achievement is contained in the related research chapter of this project.

The Research Problem

In the Midwest School District there is some evidence that the gifted program is not adequately meeting student needs. A recent study of the district's gifted learners K-5 (Fox, 1987) revealed that achievement does not keep pace with intellectual ability. To reverse the trend, an elementary program has been funded and implemented this year by the Midwest School District. It contains the following components:

1. There are magnet schools for higher achievers.
2. Specific talent identification guidelines have been introduced.
3. Weekly interaction between gifted learners and consultants is mandatory.

At the secondary level, however, there is still no coordinated effort to provide special classes for gifted learners. Students are ability grouped in advanced classes, but no specific program is presently in place. Individual needs may not be met.

There is a concern among central office administrators whether the situation identified by the study of K-5 learners continues at the secondary level. The problem is, "Do academically gifted learners 7-11 in the Midwest School District achieve proportionate to their respective abilities?"

Purpose of the Study and Related Procedures

The purpose of this study was to examine the relationships between

aptitude, achievement, and selected variables between the five years 1981-1985, thereby providing educational administrators from the Midwest School District factual information from which they might make decisions relevent to gifted learners in the system. This ex post facto study of historical data sought to address the following questions related to academically gifted learners in the Midwest School District:

1. Is there a significant relationship between measured aptitude and achievement in males?

2. Is there a significant relationship between measured aptitude and achievement in females?

3. Is there a significant relationship between measured aptitude and achievement in the combined sample population?

Using computerized information related to intelligence quotients and national achievement scores for all members of the sample population, responses to the enumerated questions were developed in the following manner:

1. For each of the five years the relationship between aptitude and achievement in males was determined by correlating intelligence quotients and test scores.

2. For each of the five years the relationship between aptitude and achievement in females was determined by correlating intelligence quotients and test scores.

3. For each of the five years the relationship between aptitude and achievement in the total sample was determined by correlating intelligence quotients and test scores.

Detailed information regarding procedures used is contained in the

Methodology chapter.

The importance of the study is exemplified by the decision-making information provided for administrators in the Midwest School District and the impact it can have on gifted learners who should be in a program that is responsive to their needs. The research can be used to indicate the success or lack of same when related to the placement of secondary level gifted students. The data presented a strong indication whether or not the present treatment of advanced achievers 7-11 is working, thereby making this study both vital and timely.

Hypotheses

Based on a study of global data in combination with the results from the previously referred to evidence that the district's elementary gifted program is presently inadequate, this study tested the following hypotheses:

1. Academically gifted students 7-11 in the Midwest School District are not achieving in proportion to their respective abilities.

2. There will be no increase in the intelligence quotients of academically gifted learners during the course of the study.

3. There will be no increase in the achievement test scores of academically gifted learners during the course of the study.

4. There will be no difference between the achievement levels of academically gifted male and female students.

The ensuing chapter will detail related research.

Definition of Terms

Academic aptitude: The children possessing academic aptitude are those children who have an aptitude in a specific subject area that is consistently superior to the aptitudes of other children in the school to the extent that they need and can profit from specially planned educational services beyond those normally provided by the standard school program. (DeChant, 1985, p. 9)

Gifted learners: Gifted and talented children are those identified by professionally qualified persons who, by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those that are normally provided by the regular school program in order to realize their contribution to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

1. General intellectual ability.
2. Specific academic aptitude.
3. Creative or productive thinking.
4. Leadership ability.
5. Visual and performing arts.
6. Psychomotor ability. (Marland, 1972, p. 2)

For definitions of relevant aptitude and achievement tests; i.e. Otis-Lennon Mental Ability Test, Metropolitan Achievement Test, Differential Aptitude Test, Iowa Tests of Educational Development, please refer to Chapter Two of this project, Review of Related Literature.

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Chapter Two

Review of Related Literature

Overview.

This chapter will contain research dealing with the following concerns related to the gifted learner:

1. Identification of the talented and gifted child.
2. Measurement of achievement.
3. Programs for developing the potential of the gifted individual.

Research will focus primarily on the secondary school gifted child. The sequence of data will be presented as follows:

1. Historical background.
2. Current literature on intelligence testing.
3. Surveys, case and field studies.

A summary of findings will conclude the related literature chapter.

Historical background.

In 1869 Francis Galton, cousin to Charles Darwin, took great interest in the hereditary factors that Darwin was investigating. Galton was among the first to systematically examine individual differences in human beings. His studies excluded environmental effects on intellectual development, thus leading to a theory of fixed intelligence: i.e. the amount of intelligence at birth remains constant throughout life.

The French government, in 1905, asked Alfred Binet to find a method of separating slow learners from other children, the purpose being to develop a special curriculum for their particular needs. This task was significant to the advancement of research because Binet believed that

intelligence was educable, a direct contrast to the prevailing theory of fixed intelligence. Binet is also known for his revision of an intelligence scale originally created by Lewis Terman at Stanford University.

Terman, working under a commission from the Commonwealth Fund of New York City, began a study of the characteristics and behaviors of gifted individuals. In 1921 he selected over one-thousand five-hundred students with an average age of eleven years and intelligence quotients averaging one-hundred fifty. (Intelligence quotients are determined by dividing measured mental age by chronological age and multiplying the result by one-hundred.) His thirty-year longitudinal study did much to dispel the myth of fixed intelligence. (Clark, 1975)

The 1930's were a time of extensive testing for career placement, aptitude, scholastic ability, personality, and marriage compatibility. During this period G. Stanley Hall, a student of Galton, introduced the concept of predeterminism. This belief assumes that maturation is determined by heredity and learning is controlled by environmental conditions. Permissivism was encouraged and an environment of nonintervention/ nonstimulation prevailed within Hall's concept.

In the next decade the fixed learning theory was confronted by doubters such as Montessori, Wellman, Skeels, Updegraff, and Williams. Their studies and subsequent follow-up research showed a definite correlation between I.Q. and a positive stimulating environment.

The 1950's brought an important new concept of intellectual structure through the work of J. P. Guilford. His factor-analytic model showed the interrelatedness of external forces and intelligence. He believed that

intelligence was educable and that creativity was a major factor in mental growth.

Jean Piaget's studies of his own children in the early 1950's presented the belief that intellectual growth resulted from the learner's active participation in the learning process. Sequential stages of development were dependent on genetic endowment and the quality of the environment. Piaget formulated one of the first interactive theories of intelligence. (Clark, 1975)

Benjamin Bloom was the next to discredit a long accepted theory, the belief that between birth and eighteen years of age human beings learn in a regularly ascending line, leveling off until age forty-five, at which time a gradual decline in intelligence bottoms out in senility. Bloom's hypothesis from reassessed data was that between birth and four years of age children accomplish half of the deviation in I.Q. that they will acquire by age eighteen. Eighty percent of the deviation in adult I.Q. is actualized by age six, according to Bloom. (Clark, 1975) From this work educators developed a new awareness of preschool years as an essential time for learning.

The variability of I.Q. was also examined by Sontag, Baker, Nelson, Kagan, and Moss from 1958-1962. Their longitudinal studies of three-hundred children from prenatal development through adulthood showed consistent fluctuation in I.Q. scores, especially at the extreme ends. Boys showed more variation than girls.

The interactive theory of intelligence has received support in recent years from the studies of Bruner, Hunt and Bayley, 1972. One

outcome of this work has been the restructuring of the Stanford-Binet Intelligence Scale. Results from the revised test showed a significant rise in the I.Q. level, especially in the preschool population (Clark, 1975).

As methods for defining intelligence reach new levels of sophistication, the impact of environmental factors becomes increasingly evident. Building on the work done by pioneers of intellect research, educators can use the historical knowledge as a foundation for on-going studies related to the complexities of identifying the gifted learner.

Current literature on intelligence testing.

The intelligence quotient score remains one of the strongest measures of intellectual giftedness. The older method of obtaining a score is to allow a child to respond to a series of questions which experience has shown will be answered at different rates of exactitude by different age levels. This mental age score provides a performance comparison with that of other children.

A second more recent way of determining I.Q. is to give a series of items to a child which have previously been given to a representative sample of children the same age. The score of the tested child is then compared with that of all children in the respective age bracket. The result is a deviation I.Q.; i.e. how far the child differs from the average performance of the specified age group. The deviation score can then be translated into I.Q. score and interpreted in the same way as those subjects identified by the first method.

The I.Q. score gives educators an indication of the current mental level of a child in comparison with his own age group. It also provides

a prediction as to the rate of the child's future mental growth. (Gallagher, 1979)

Standardized tests have been formulated for the purpose of finding and measuring the abilities of gifted children. Seven of the most popular instruments are described in the following paragraphs.

The Stanford-Binet Intelligence Scale is an individual test of mental activities for ages two and over. The test is given orally with categories including language, memory, conceptual thinking, verbal and nonverbal reasoning ability, numerical reasoning, visual motor ability and social intelligence. This test is valid for assessing general intelligence. It is predictive. Low socioeconomic groups and culturally different children tend to score lower than those children of a higher socioeconomic level. An advantage over other tests is the successful identification of low range intelligence and extremes. (Clark, 1979)

The Otis-Lennon Mental Ability Test is a group intelligence test which is used as a power measure for grades K-12. This test determines verbal-educational aspects of mental abilities, not the practical-mechanical. Items measure broad reasoning abilities involving manipulation of ideas. This timed test correlates adequately with other general scholastic aptitude measures. Test results must be interpreted carefully for children with other than normal backgrounds and motivation. Insufficient range at some levels makes measurement of exceptionally high or low ability students difficult. The test predicts scholastic success because it is a direct measure of scholastic ability. (Clark, 1979)

The Iowa Tests of Educational Development are measures of the ability

to recognize the essentials of good writing, to solve quantitative problems, to analyze discussions of social issues critically, to understand nontechnical scientific reports and recognize sound methods of scientific inquiry, to perceive the subtle meanings and moods of literary materials, and to use sources of information and common tools of learning. This norm-referenced achievement test uses subtests divided into two overlapping levels oriented toward graduated abilities within a younger student's direct experience as well as measuring well above minimum competency. (Lindquist, 1987)

The Differential Aptitude Test Career Planning Program uses information from a battery of tests including verbal reasoning, numerical ability, abstract reasoning, clerical speed and accuracy, mechanical reasoning, space relations, spelling, and language usage to help guide students toward skills they might use in job related orientation. Counselors and students then receive a carefully developed individual interpretation which focuses on career goals. (Super, 1973)

The California Achievement Test is a group achievement series in five levels: lower primary, upper primary, elementary, junior high, advanced. Grades two and one-half through grade fourteen are covered. Reading vocabulary, reading comprehension, reading total, arithmetic reasoning, arithmetic fundamentals, arithmetic total, mechanics of English, spelling, language total, and total handwriting scores are given. These are intended to be diagnostic tests. Validity of content is varied when compared to respective school curriculums. Correlation between subtests of this battery and those of the Stanford Achievement Test and

the Metropolitan Achievement Tests are uniformly high. All these normative tests measure similar skills. The test is recommended for schools that want to focus their achievement measurement and diagnosis on the traditional, fundamental skills and content areas of reading, arithmetic, and the English language. (Clark, 1979)

The Metropolitan Achievement Test is a group achievement test series at six levels measuring basic skills in grades one and one-half through twelfth. The test series was developed to measure achievement on material to which students were most commonly exposed. Emphasis is placed on rote learning of information and skills. This test does not measure higher cognitive processes. The tests at all levels make possible the measure of superior achievement; however, measurement of poor learners is generally thought to be inadequate. (Clark, 1979)

The Torrence Test of Creative Thinking is based on Guilford's Structure of the Intellect. It may be given individually or in groups. The intent is to find process abilities necessary for operating creatively, kindergarten through college level. Scores are given for fluency, flexibility, originality, and elaboration in each area. Quality of response is not considered in the scoring. Reliability is hampered by the controversy over using measures of fluency, flexibility, and originality as measures of creativity. (Clark, 1979)

According to the eighteenth Gallup poll of the public's attitudes toward the public schools, Americans favor standardized testing. Seventy-seven percent of those surveyed would like to see local schools administer national achievement tests for the purpose of drawing

comparisons with other communities. (Gallup, 1986)

There is, however, widespread disagreement concerning the validity of national tests that are used to measure intelligence. Columnist Chuck Stone suggests the Scholastic Aptitude Test can only tell how well one person performs in relation to someone else, not how intelligent a person is or how much progress one might make if placed in an optimal learning situation. He acknowledges variables that have a high correlation with test scores include the following:

1. Whites score higher than blacks.
2. Upper income students score higher than low income students.
3. Northeastern students score higher than Southern students.
4. Males score higher than females.

Mr. Stone emphasizes the last comparison as being significant to his argument since women graduate from high school with higher grade-point averages than males, even though they score lower on the S.A.T.'s. The biggest fallacy is their use as a uniform measuring stick for a multiform population. The I.Q. test is being increasingly discredited for this very reason. (Stone, 1987)

Further expressions of caution are sounded in these points related to measuring test results of gifted children:

1. Standardized tests are geared toward groups of students with common goals. Students in gifted programs, however, are encouraged to work towards individual goals based on their own special abilities and interests.

2. Gifted students are often involved in projects which are long-

term in scope. This can't be measured with short-term oriented tests.

3. Standardized tests generally deal with basic skills. Typically, gifted students are involved with application of learned skills. Concepts dealt with in gifted programs are not easily broken down into individual, explicit skills development and are therefore more difficult to measure.

4. Gifted students generally score towards the upper end of standardized tests. It is more difficult to show improvement in this narrow margin of score points.

5. Although locally designed tests are better tailored to the program's goals, they lack the reliability and validity of standardized tests. Local tests often rely too heavily on teacher judgment and homegrown instruments. (Johnson, 1986)

Educator Lauren Sosniak points to a school district that spent thousands of dollars to coach students on the Preliminary Scholastic Aptitude Test. The summer program was designed to increase the number of National Merit semi-finalists who are selected according to P.S.A.T. scores. Based on the results of testing, after the course high scoring students were identified as gifted. Ms. Sosniak's complaint is the misuse of money targeted for talented and gifted (T.A.G.) programs. She also contends that considerable confusion already exists in identifying the talented and gifted child. No one single measure of ability is sufficient for including or excluding a student from the T.A.G. program. (Sosniak, 1987)

Surveys, case and field studies.

This section of the chapter will examine data related to the effect of environment on gifted children, achievement comparisons of boys and girls,

programs for gifted learners, economic considerations, and gifted dropouts.

Many psychologists and parents feel the climate surrounding today's learner is one in which children are increasingly thrust into independence and self-reliance before they have the skills and ability to cope. Children today are constantly being pushed. The statistics are somewhat ambigious.

According to educator, B. Brophy, by age eighteen, in 1985, twenty-three percent of children had lived with a single parent, compared to twenty percent in 1980 and twelve percent in 1970. In fifty-eight percent of today's two-parent households, both parents work. Advanced curriculum pushing gifted children, adult responsibilities placed on children from a climate of broken homes, television violence, social changes--all place stress on students. Even so claims Mr. Brophy, a recent Kent State study of five-hundred seventy-three students in thirty-eight states found that children of working mothers scored higher on I.Q. and reading tests, had better communication skills, were absent fewer days, and were more self-reliant.

Children tend to repeat parental patterns with their own offspring. A higher rate of divorce, remarriage and unwed parents have created a generation crisis. Other studies show the amazing ability of gifted children to snap back from adversity. Stress can be handled through good communication, parental modeling, and respect for the individuality of children. (Brophy, 1986)

In studying the climate of advanced achievers, education researchers Lee and Byrk found that girls attending single-sex Catholic schools do better academically than their counterparts in private secondary co-ed

schools. Measured subjects included reading, writing, and science. The girls do more homework, watch less television, have fewer absence and discipline problems, fewer students per teacher ratio, no boy distractions, fewer elective courses and a homogenity of purpose. (Vandershaf, 1987)

Gifted female students fall behind gifted male students during high school. This is the conclusion drawn from research on students with high scores on standardized intelligence tests. Two University of Iowa counselors compared test scores of 77,000 students nationwide through the American College Testing Program. They found for every four boys who gain a perfect math score, there is only one girl. In natural sciences the ratio is five to one in favor of boys. The reason appears to be anxiety on the part of girls who fear taking higher math. A further concern is that very few researchers are studying the problems that gifted girls face in school. (Kerr, 1987)

Along with studies of the effect environmental forces have on intelligence is research into the plasticity of the brain. The technological search is for external agents that can enhance normal brain functions and remedy malfunctions. The enriched environment investigations center on the development of the brain's neocortex which encompasses learned rational behavior. The hope is to create an excess of connections along related areas that transfer information. By using learning and experience to strengthen the useful connections, enough synaptic flexibility would allow neural connections to shift about throughout life as conditions change and new learning and problem-solving challenges are presented.

Research from Diamond and Rosenzweig suggests that an enriched social environment can enhance the physical development of the brain's neural connections and support cells. Studies of rats have shown that merely keeping busy does not provide the stimulation necessary for growth. Ms. Diamond suggests that educators approach their assignments with a commitment to provide students with tender loving care. This act alone positively extended the life span of animals and affected their cortical development. (Sylwester, 1986)

Enrichment programs cost money. Congress is taking a new look at funding for gifted learners. At the state level statistics show an increase in total spending for gifted education. Further increases are anticipated in years to come. Effective programs, however, have been unevenly distributed among the states. Spending increases have often been added to a very slim base. A national emphasis on gifted programs has been lacking since 1981 when the U. S. Department of Education dismantled its office of gifted and talented programs. A majority of states, twenty-eight, do not require districts to offer special resources or instruction to the gifted. Twenty-nine states do not require any special training for teachers of the gifted. In a study of sixteen-hundred schools nationwide, the Richardson Foundation discovered in 1985 that fewer than half of the gifted programs had much time or adequate materials given to them. (Flax, 1987)

New commitment toward gifted programs is now apparent with increased funding and the movement toward magnet schools. Program centers are being

established in specific district schools where students have a choice of enrollment in other than their neighborhood attendence areas. Julian Stanley, director of the Study of Mathematically Precocious Youth at Johns Hopkins University in Baltimore, Maryland, suggests the funding of a state residential school for the mathematically talented. (Stanley, 1987) In North Carolina, the State School of Science and Mathematics is already a reality. (Eilber, 1987)

Enrichment programs are being developed throughout the nation in response to the public's new awareness of the need for excellence in education. While traditional high school consumer math courses generally focus on underachievers, at North Shore High School in Glen Head, New York, advanced placement calculus students are learning to verify a credit card finance charge and to compute capital gains on stock transactions. Critical thinking skills activities use Internal Revenue Service publications, The Wall Street Journal, and New York Commodities Exchange data to solve consumer problems. Advanced math skills are used in a context that better prepares students for the practicalities of adult life. (Toepfer, 1987)

Research into programs featuring academically competative games has revealed the following information:

1. In Collinville, Illinois, grades one through twelve used games to stimulate interpersonal communication skills in those who had shunned relationships. (Williams, 1986)

2. Test results from a 1972 Johns Hopkins University study revealed that on a divergent solution test an experimental class playing academic games obtained a posttest score double the pretest. In the control group there was no gain. Additional findings were a significantly greater amount of cross-race and cross-sex cooperation; low and average ability students

had a more positive attitude; there was a greater amount of peer tutoring; students had less difficulty and greater satisfaction.

3. From a study in the Journal of Educational Research, September, 1966, an experimental group of junior and senior high students achieved an average increase in I.Q. score of over seventeen points when academic games were used to stimulate the environment.

4. Absenteeism in Detroit intercity schools dropped from twenty-nine percent to nine percent in 1972 when programs featuring academic games were implemented.

5. A junior high study (Williams, 1979) showed that games gave practice sessions for stress-coping behaviors. Students learned coping behaviors toward success and failure. They learned to transfer abilities to lead, communicate, and solve problems to social situations.

6. Studies by Torrance (1965), Passow (1979), and Pressey (1965) support the need for students to participate in challenging and motivating environments other than the classroom setting. (Williams, 1986)

National educators are concerned about gifted students who do not remain in the programs established for them. A much cited 1958 Iowa study of talented students has been incorrectly interpreted to show that eighteen percent of high school dropouts are gifted. In actuality the figure reflects the percentage of the gifted who drop out. A more recent review of research on the dropouts who are gifted (Lajoie & Shore, 1981) concluded that the proportion of gifted dropouts may be average, i.e. four percent. Evidence of the value of gifted programs should be based on affirmative, not negative or misinterpreted data. (Irvine, 1987)

Summary.

The literature and examined data in this chapter was presented in order to familiarize the reader with the issues relevant to the gifted learner. The historical background, current studies and information dealing with gifted programs revealed a commonality of thinking in regards to identifying and measuring the achievement of gifted learners. The following points can be enumerated according to the data which was investigated:

1. Identification of the gifted learner is complex. There is no single test universally accepted for determining intelligence.

2. National test batteries which are used to determine intelligence quotients all have drawbacks in their respective methods of identifying talented children; however, the I.Q. remains the primary indicator of mental development.

3. There is a correlation between test scores and I.Q. Similarly, there is a correlation between achievement and grade point average.

4. Socioeconomic and environmental factors are directly related to student achievement. Gifted children perform better in a stimulating educational climate.

5. Programs for gifted learners are diverse throughout the United States. Emphasis on such program development has only begun to receive national attention. Funding for gifted programs has been proportionate to the interest taken in them. As the focus on gifted programs becomes more prevelant, so does the economic support.

6. Educational research is on-going. Refinement of programs and sophistication in research methods is increasing.

Although a significant amount of data was conclusive and well supported

by facts, many of the studies were related to a specific school or situation which used too small a sampling to be considered valid. Numerous general facts were presented without stipulating the size of the sample, the population area, the rate of return, or the conditions under which the study was made.

Identification of the talented and gifted learner is essential if such children are to reach self-actualization. A coordinated effort to identify and meet the needs of talented and gifted children is needed in order to help meet the public demand for excellence. Until a better measuring instrument is developed, gifted learners will continue to be identified by commonly accepted intelligence tests and grade-point averages. Program development for these youth depends on proper methodology to determine intelligence. The need for continuing research clearly exists.

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Chapter Three

Methodology

All information relevant to achievement test scores, intelligence quotient level, and sex of all students is computerized on file at the central office of the Midwest School District. Access to this confidential information was granted by the Executive Director of Educational Services. The intent of this project was to examine the intelligence quotients and standardized test scores of academically gifted learners identified by the Midwest School District testing program, correlating the results in order to identify trends needing curricular modification.

Subjects

The measured population was sixteen secondary level students, ten males and six females, identified by the Midwest School District as academically gifted. The subject's records were examined for student ability index and achievement test scores during each relevant year of the study which covered the years 1981-1985. The first year for the district's gifted program was 1981. Subjects were in seventh grade in 1981 and eleventh grade in 1985, the last year that achievement tests are administered in the district. Through an ex post facto examination of historical data, the correlation between measured student ability (S.A.I.) and achievement tests was determined. Treatment of the subject data was designed to test the previously stated hypotheses. The specific statistical tool was the correlational coefficient using the Pearson product-moment method for greatest accuracy.

The study was only concerned with academically gifted learners.

Limitations

Conditions beyond the control of the researcher were as follows:

1. Intelligence quotient testing does not occur every year. The district measures students in grades one, two, four, six, seven, and nine.

2. Standardized tests differ in junior high and senior high school. The Metropolitan Achievement Test (M.A.T.) is given in seventh grade. The Differential Aptitude Tests (D.A.T.) are given in eighth grade. The Iowa Tests of Educational Development are administered in grades nine and eleven.

3. Achievement testing does not occur every year. The district measures students in grades seven, eight, nine, and eleven.

4. Teachers and teaching methods are variables sensitive to transition and reduction in force that occured during the given time frame of the study.

Assumptions

This study was carried out based on the following assumptions:

1. All teachers of the sample population are competent.

2. Academically gifted learners were accurately identified.

3. Standardized tests used by the district, although different at respective grade levels, are proportionately similar when correlated with intelligence quotient measurement.

4. Although testing is not done every year, the frequency was sufficient to provide comprehensive information suitable for drawing

valid conclusions in this study.

Procedure

For each year the following steps were taken:

1. From grouped data measure the central tendency; find the range, mean, and median. Determine who is above/below the median.

2. Calculate the standard deviation. Using grouped data measure the variance of respective male and female test scores from the mean. A larger deviation shows less progress academically.

3. Calculate T scores for individual subjects based on the standard deviation from the mean. Compare variance between respective sexes.

4. From grouped data compare respective intelligence quotients and achievement test scores. Compute the correlational coefficient for males, females, and composite.

5. Graph the results.

Individual comparisons showed an increase or decrease in achievement levels. Group comparisons showed an increase or decrease in achievement levels relative to sex.

The accepted margin of error was $p < .05$. A Type-One error probability of $p < .01$ was not practical because of intelligence quotient fluctuation and enumerated limitations.

Calculations were carried out to thousands of a percent for greatest accuracy.

Chapter Four

Presentation of Data

Correlation results

The historical examination of the 16 academically gifted subjects produced the following information:

1. The subject population composite correlational coefficient measuring the relationship between Student Ability Index and Achievement Test Scores declined each year throughout the study period 1981-1985.

2. The grouped male subject correlational coefficient declined each year throughout the course of the study, 1981-1985.

3. The grouped female correlational coefficient rose during the first two years, 1982 and 1983, then dropped sharply in 1985 to a lower level than the 1981 origination point.

Student Ability Index and Achievement Test Score data

The relationship between the Student Ability Index (S.A.I.) and Test Score Percentage, 1981-1985, is displayed by the cumulative raw percentile scores for each year that was statistically analyzed (see Table 1). As Table 1 reveals, 14 of the 16 subjects, 9 males and 5 females, increased or remained the same in their respective S.A.I. levels as measured in 1981 and 1985. One male declined 1 point and 1 female declined 4 points. Eight students, 5 males and 3 females, increased from 1 to 5 percentage points. Four males and 2 females remained constant. Since there was neither an intelligence test nor an achievement test given in 1984, the data is interrupted at that point.

Table 1

Student Ability Index and Test Score Percentages, 1981-1985

Subject	Sex	SAI,1981	MAT,1981	DAT,1982	SAI,1983	ITED,1983	ITED,1985
1	F	.99	.99	.99	.99	.99	.99
2	M	.99	.99	.99	.99	.99	.99
3	M	.99	.99	.99	.99	.99	.99
4	F	.99	.99	.99	.99	.99	.99
5	M	.99	.99	.97	.99	.97	.97
6	M	.98	.99	.99	.99	.97	.98
7	F	.98	.98	.95	.99	.97	.96
8	M	.98	.62	.90	.98	.80	.92
9	F	.98	.99	.99	.99	.96	.96
10	F	.97	.96	.90	.93	.96	.97
11	F	.96	.99	.85	.99	.99	.98
12	M	.95	.98	.97	.95	.97	.95
13	M	.95	.96	.90	.98	.96	.95
14	M	.94	.99	.90	.99	.99	.99
15	M	.93	.98	.95	.96	.96	.95
16	M	.87	.94	.90	.86	.95	.94

Note. SAI = Student Ability Index. MAT = Metropolitan Achievement Test. DAT = Differential Aptitude Tests. ITED = Iowa Tests of Educational Development.

Mean and Standard Deviation data

Grouped means and standard deviations relative to yearly student ability indices and test scores are presented in Table 2. The data indicates a steady increase in the S.A.I. mean for males while females peak during the second year and decline slightly in 1983. S.A.I. standard deviations are larger for males than females each year of the study. This also holds true for test scores, especially in 1982 where a difference of 3.352 percentage points exists.

Composite S.A.I. means increased each year. Composite test score deviation figures showed a large increase in deviation between 1981 and 1982, 2.32 percentage points, then a decrease of 2.38 points in 1983, and a smaller increase of .672 percentage points in 1985.

T scores

From T score calculations group results revealed an increase in male S.A.I.'s from 48.1 to 52.5 and a decrease in test scores from 48.6 to 47.2 (Table 3). Females showed a decline in S.A.I.'s from 54.5 to 52.1 and a slight increase in test score ability from 52.8 to 53.4. The composite showed an increase in ability (S.A.I.) from 50.5 to 52.6, and an overall decline in test scores from 50.3 to 49.5.

Frequency polygon

The yearly variance in the student ability index is shown in Figure 1, Student Ability Index Comparison. It follows the pattern of the mean information presented in Table 2.

Figure 2, Test Score Comparison, shows the gradual decline in test score achievement for females. Males dropped almost 3.5 percentage

Table 2

Grouped Mean (M) and Standard Deviation (SD) for Student Ability Index (SAI) and Test Scores (TS), 1981-1985

Year	SAI M	SAI SD	TS M	TS SD
1981				
Males	95.444	3.726	97.889	1.657
Females	97.833	1.097	98.333	1.135
Composite	96.4	3.179	98.067	1.46
1982				
Males	95.7	3.607	94.6	3.929
Females	98.5	0.5	98.0	0.577
Composite	96.5	3.311	95.571	3.785
1983				
Males	96.667	4.02	97.222	1.412
Females	98.0	2.236	97.667	1.351
Composite	97.2	3.487	97.4	1.405
1985				
Males	96.9	3.885	96.3	2.326
Females	98.0	2.236	97.5	1.258
Composite	97.313	3.39	96.75	2.077

Note. Two male test scores were not included in the calculations because of the skewing effect on the data that would have occured.

points between 1981 and 1982, rising 2.5 points in 1983, and falling again in 1985. The composite follows a pattern similar to the male illustration.

Table 3

T Scores

Year	SAI	TS
1981		
Males	48.1	48.6
Females	54.5	52.8
Composite	50.5	50.3
1982		
Males	48.1	47.4
Females	54.5	52.1
Composite	50.5	49.0
1983		
Males	52.5	48.7
Females	52.7	51.9
Composite	52.6	50.0
1985		
Males	52.5	47.2
Females	52.7	53.4
Composite	52.6	49.5

Note. $p < .05$. SAI = Student Ability Index. TS = Test Scores.

Figure 3, Correlational Coefficient for Student Ability Index and Test Scores, shows a gradual decline for the male population. The female

Figure 1

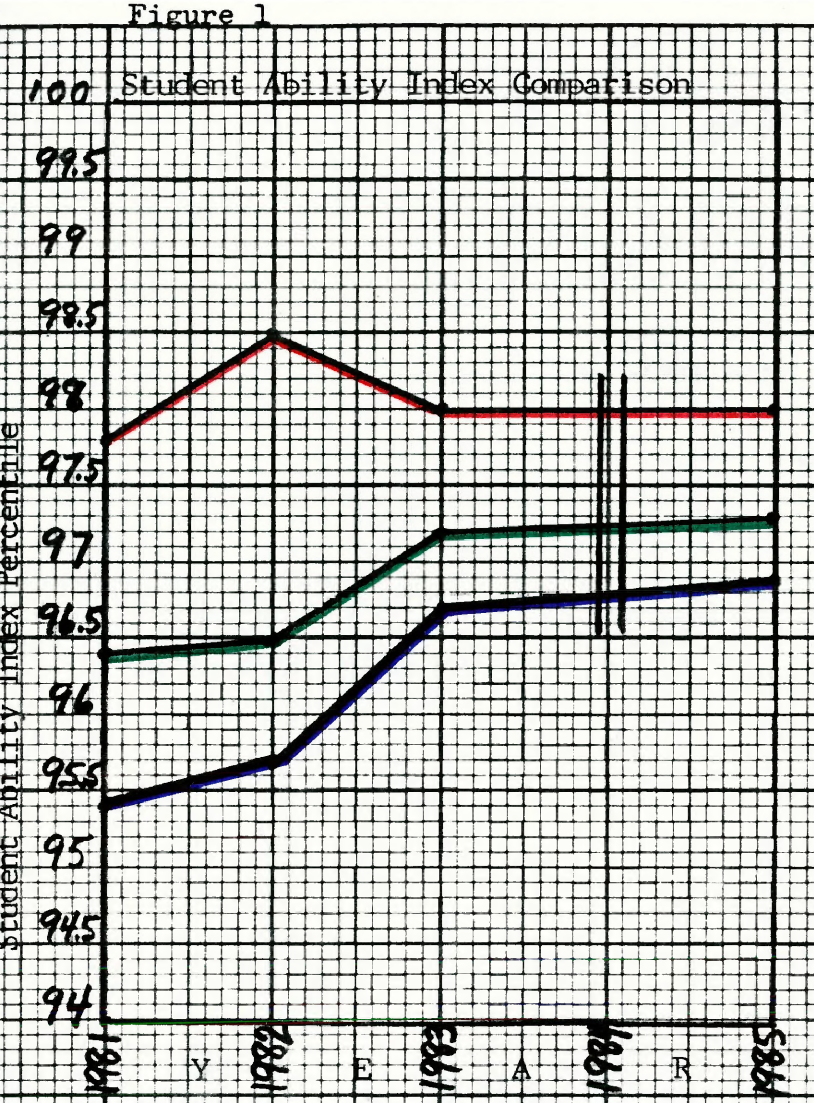
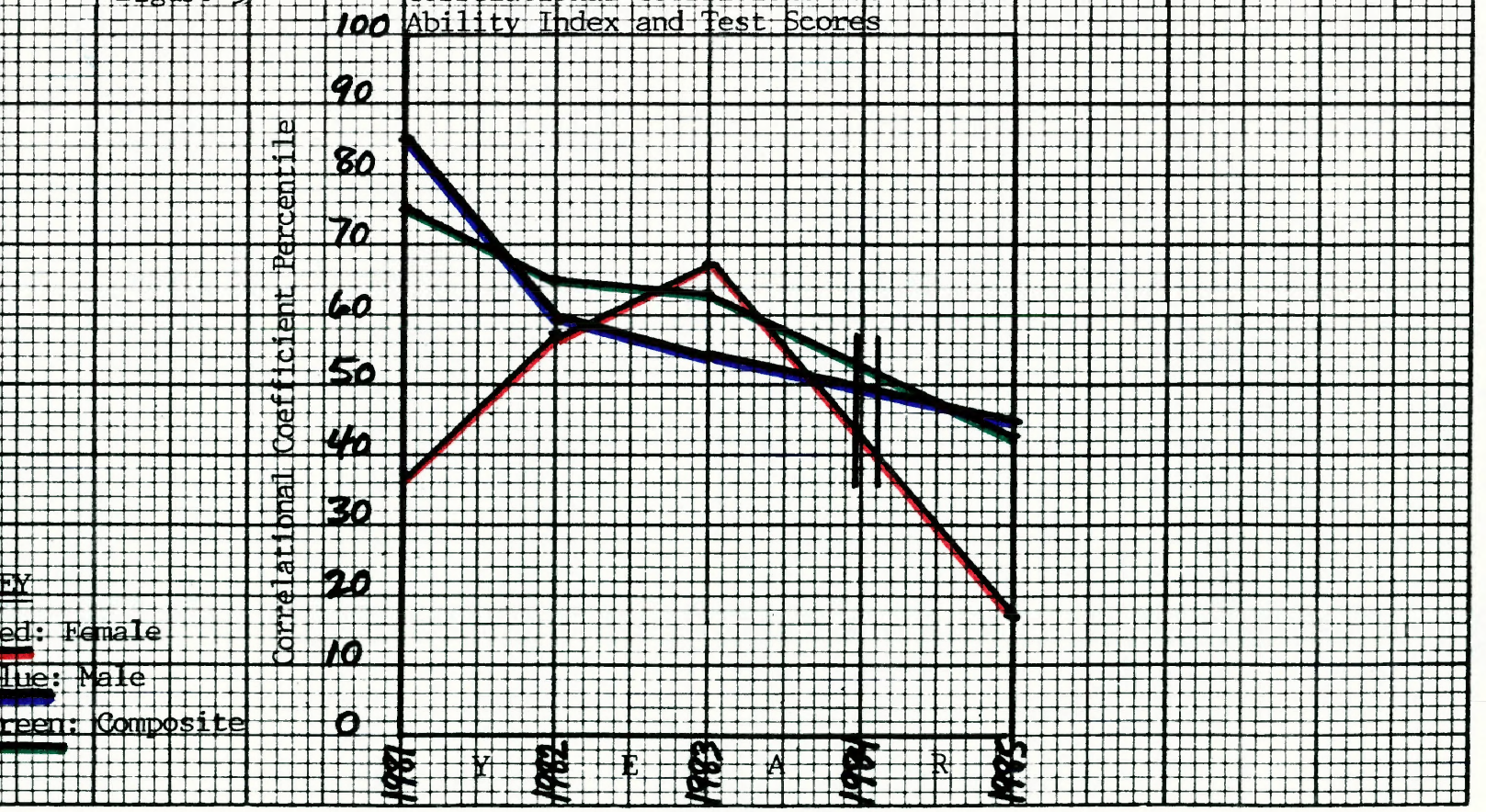


Figure 2

Figure 3



correlational coefficient increased between 1981 and 1983, then fell from .677 in 1983 to .178 in 1985. The composite showed a steady decline from .749 in 1981 to .421 in 1985.

Chapter Five

Conclusions and Recommendations

The findings from the historical survey showed a yearly decline in the composite correlational coefficient for Student Ability Index and Achievement Test Scores of the academically gifted population. Composite T scores mirrored this correlation. This data supports the primary hypothesis, i.e. academically gifted students 7-11 in the Midwest School District are not achieving in proportion to their respective abilities.

The second hypothesis that there would be no increase in the S.A.I.'s of academically gifted learners during the course of the study was rejected. There was in fact a steady increase in the correlated composite S.A.I. percentages.

The hypothesis that there would be no increase in achievement test scores of academically gifted learners found support in the data. There was a decline between the first and last measured years of the survey.

The final hypothesis that there would be no difference between the achievement levels of academically gifted male and female students was rejected. Female students, as a group, scored higher on the achievement tests than their male counterparts every year.

T score calculations showed a slightly different trend in the female population, i.e. a slight rise in test score and a decline in student ability index; however, the composite and correlation factors support the principal hypothesis. There is a difference in T score comparison and correlational measurement, perhaps accounting for the

variance.

The validity of the data is somewhat clouded by the fact that three different tests were administered to determine achievement, thus putting stress on correlation. In addition, student ability was measured twice, not each year. Finally, the sample size is small. Nevertheless, validity and correlational factors have been affirmed by educational administrators in the central office of the Midwest School District (see Appendix A). They sought a trend rather than "significance" in the data. The study, even in this limited form, does indicate a continuation on the secondary level of the trend discovered in the elementary dissertation (Fox, 1987), i.e. academically gifted learners are not achieving proportionate to ability.

The data showed a definite drop in achievement level for both male and female gifted students, especially at the high school level, with females showing the greatest rate of decline. A possible explanation for the accelerated dropoff in correlation is the lack of a gifted program in high school. The cohesiveness of a total program K-12 could enhance system-wide accountability for test scores of gifted learners. Such a link between elementary and secondary would lead to greater involvement by all educators--counselors, teachers, and administrators.

The value of this study lies in the use the administration can make of the findings which lend credence to the need for a revision in the treatment of gifted learners on the secondary level. A curricular adjustment seems in order so that the needs of academically gifted students may be met.

My recommendations for the secondary gifted curriculum parallel

those being implemented at the elementary level. They are as follows:

1. Identify and place secondary level gifted learners.

2. Provide individualized instruction for gifted learners in an environment where these special children are grouped.

3. Assign trained consultants and counselors at the secondary level to provide weekly interaction with gifted learners.

4. Designate a qualified administrator to be responsible for coordinating the total gifted program K-12. Duties should include overseeing record-keeping, identification of gifted learners, instruction, and ongoing curriculum development.

The implication for educational administrators in the Midwest School District is to build a strong case to convince the board of education to fund a program which meets the needs of gifted children. My survey has provided relevant information toward that end. If such a curricular revision is forthcoming, a contribution for the benefit of students in the Midwest School District will have been made.

Appendix A

Council Bluffs Community School District

Central Administration Office
12 Scott Street Council Bluffs, IA 51501

April 11, 1988

Graduate Jury
University of Nebraska at Omaha
Omaha, Nebraska

Graduate Jury:

Mr. Jim Misner is currently conducting a project entitled "Do Academically gifted Learners 7-11 in a Midwest School District Achieve Proportionate to their Respective Abilities?" Mr. Misner has requested that statements be provided to you covering three topics of concern and importance.

1. In our district no standardized test is administered in grade 10, therefore, any study done would need to take that into consideration.

2. The standardized tests used in Mr. Misner's study include the Metropolitan Achievement Test (MAT); the Differential Aptitude Test (DAT); and the Iowa Test of Educational Development (ITED). We accept the correlations developed between these three test from this study.

3. At this time we are interested in determining what type of trend the data indicates with regards to student ability in relation to their achievement. It is, therefore, not necessary to establish a "significant" relationship between the students' ability scores and achievement scores.

The results of Mr. Misner's project will help in determining the need for a more in-depth study of this particular group of students and how to best meet their needs.

Sincerely,

Ed Propst, Supervisor of Testing and Program Evaluation