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Critique of Some Recent Research in the Identification of the Gifted Child

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**CRITIQUE OF SOME RECENT RESEARCH IN
THE IDENTIFICATION OF THE GIFTED CHILD**

by
Patricia Chisholm

**Submitted to the Graduate School of Loyola
University in partial fulfillment of the
requirements for the degree of
Master of Arts**

**Chicago, Illinois
1965**

PREFACE

In recent time, there has been much demand for research in the area of the gifted child. Basic to any provisions for the gifted is the identification of giftedness. While much research is being conducted in the area of the gifted child, little has been done to bring together significant findings of recent research. The purpose of this paper is a discussion of recent trends in the problem of identification of giftedness.

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CHAPTER I

INTRODUCTION

We must watch them from their youth upward and make them perform actions in which they are most likely to forget and to be deceived and he who remembers and is not deceived is to be selected, and he who fails the trial will be rejected. This will be the way.

Plato

The problem of identifying the gifted is not a new one. The method of identifying by means of a test is not a new one. Twenty-four centuries ago the way was pointed out. The concept is ancient. The specifics are recent. It is the specifics that appear to be causing much difficulty.

There is no one definition of intelligence, nor is there any one definition for those who possess more than the average allotment. Research studies on the best means for identification are contrary. And even when such individuals have been found, there is conflict regarding the best methods for training and nurturing them.

In the past ten years the public has become more conscious of the dilemma of giftedness. Research in this area is gradually growing to significant size. Certain myths concerning giftedness have been subjected to scientific investigation and found to be just that...myths. The derogatory term "egghead" has

become passé. The very concept of intelligence has become more general, inclusive, and flexible. Changes are underway in the methods of testing, the criteria to be measured, the construction of measuring instruments.

Intelligence, once thought to be unilateral, constant and genetically determined, is now being viewed as multidimensional, flexible, and greatly influenced by environmental and emotional conditions. A similar change in the concept of giftedness is being seen. Once regarded as mere precociousness or worse, giftedness is now being regarded with more understanding and respect. Psychological tests now attempt to measure more than academic behavior; they are being designed to include creative behavior, divergent thinking and special talents in specific arts.

1960 marked an important change in the concepts of intellectual functions. It also marked a decided change in the theories of ages at which learning takes place. The early school admission for academically able began to gain ground, in research, if not in actual practice. The status of research in the many phases of giftedness appears, in 1965, to be at midpoint. While much has been accomplished and revealed, much more is still in process and much more is yet to be tested. The growing trends seem to indicate that in the near future we shall know as much about other concepts of giftedness as we presently know about academic excellence. The unfortunate fact remains, however, we already know much more about giftedness than we put to

practice. Dissemination of research in this area has been quite poor.

Assumptions Underlying Research

First, there exists a group of children who may be identified by specific criteria and termed "gifted."

Secondly, there are different means by which human behavior can be measured.

Thirdly, there are various dimensions of giftedness which can be specified.

Fourthly, there are characteristics of giftedness which can be observed.

Factors Which Make Identification Difficult

First, there is no general agreement among authorities concerning the specific limitations of giftedness.

Secondly, the rapidly changing concepts of intelligence have outdistanced the means of measurement. In fact, there are certain factors of intelligence which will probably never be measured.

Thirdly, the effect of environment on intelligence has recently been shown to have more vital and limiting powers than previously considered.

Fourthly, motivation and attitude play important roles in the development of human potential; consideration must be given to multiple internal and external factors.

Purpose of Identification

First, identification should be made in order to meet the individual needs of the individual child.

Secondly, the identification should be made in order to place the child in the most advantageous program for his potential.

Thirdly, identification should be continuous and flexible; children develop at different rates and in different ways.

Fourthly, identification should include as many diverse criteria as possible. Academic talent is but one of many talents that can be attributed to gifted children.

Procedures for Identification

First, identification should be based on what we already know. Certain aspects of recent, valid findings of research should be put into practice.

Secondly, identification should be systematic; it should begin at the earliest possible age and continue during the child's formal education.

Thirdly, identification records should be cumulative, the date, results and the name of the measurement employed should be specified.

Fourthly, the identification should be inclusive. Results of appraisals other than standard measures should be recorded; these would include scholastic as well as social status, achievements both in and out of school. Any form of unusual

recognition should be marked. The aim of such a procedure is to give the most complete picture possible.

In 1959, Abraham¹ contended that gifted children constituted a major area of neglect in the consideration of the nation's natural resources. He particularly designated those children whose giftedness went unrecognized and undetected. The reasons which he presented for the dire situation involved the lack of stimulation found in the conventional classroom and the tendency for conformity, rather than individuality, to be rewarded. In the short period of five years, this area has become less and less neglected.

In 1961, Anderson² edited a compilation of research on the academically talented student. The report made a significant contribution toward alleviating the situation. It covered every important phase related to the academically talented child; it delineated specific areas in need of more research. The report included Guilford's multidimensional concept of intelligence, the studies in creativity, cultural factors which influence potential ability, personality and emotional factors, and administrative provisions of various programs to deal with the gifted. Anderson's report certainly brought to light the many attempts being made to ferret out the undetected, gifted child. The scope of

¹Willard Abraham, "Gifted Children: Unfinished Business," Exceptional Child, XXV (March, 1959), pp. 316-318.

²Kenneth Anderson, Research on the Academically Talented Student (Washington, D.C.: National Education Association, Project on the Academically Talented Student, 1961).

such a report precluded dwelling at length in any specific area of research.

Gowan's³ annotated bibliography on the academically talented student marked another major contribution. He delineated the most outstanding works dealing with the entire subject of the academically gifted; he summarized the findings of research consistent enough to be put into practice. Gowan included only those works published after 1950. Gowan's work, as Anderson's, dealt with all phases of academic talent; it did not develop in great length any one particular aspect of the research.

Gowan anticipated some of the problems that would result from changing concepts of intelligence. He warned that the IQ derived from standardized measures of intelligence was inadequate. He commended the multidimensional criteria of identification employed in studies by Pegnato and Birch, Fliegler and Bish, Goldberg, and Newland. Noting that the practice fell far behind the results of research, he stressed the importance of dissemination of research findings to a wide audience. He particularly noted the need for better communication between researchers and teachers; he advocated simple restatement of research in terms that teachers could apply to instructional use.

Newland's critique was aimed at certain general charac-

³ John C. Gowan, An Annotated Bibliography on the Academically Talented (Washington: National Education Association, Project on the Academically Talented Student, 1961).

⁴ John C. Gowan, "Present State of Research on the Able," Exceptional Children, XXVII (September, 1960), pp.3-5, 17.

teristics of research on the gifted. He identified communication as a major problem; the communication between researchers involved ambiguities of definition, results of research fail to reach the very persons who could put them to use. A second problem confronting researchers involved the impact of the discovery of a large number of factors of intellect and the variety of ways in which intellectual giftedness might manifest itself. Newland spoke in broad, general terms, he included current research by category. He concluded with four significant needs:

1. Improvement is badly needed in the area of nomenclature. If researchers cannot agree on uniform terminology they have greater obligation to make unmistakably clear the nature of the group on which the research is reported.
2. Validity and reliability of the devices employed must be carefully considered before research is carried out, and must be fully described in any repetition of research.
3. Research should be based on sound psychological theory and well described educational practice.
4. There is need for highly intuitive, informal tinkering, either inductive or deductive in nature, for it is out of such manifest curiosity that more rigorous and precise study of the variables so identified can and must be carried out.⁵

★ This paper shall be in a sense "an informal tinkering." It is limited to the problem of identification of giftedness. It shall deal with research conducted from 1960 to 1965. Some few research studies, conducted previous to 1960, are included on the basis of their significance or their relation to some current conclusions. The attempt has been made to deal with those aspects considered fundamental and those research studies in which

⁵T. Ernest Newland, "A Critique of Research on the Gifted," Exceptional Child, XXIX (April, 1963), pp. 391-398.

the research methodology agreed with standard procedures. The term "gifted" as used in this paper is all-inclusive. In the research studies cited, the specifications of the researcher shall be defined and utilized with regard to that particular study.

In dealing with research on the gifted it is necessary to recognize the limitations placed on the term "gifted." Individual researchers should define what they mean by the term; the definition should contain specific criteria which can be understood and applied by the reader in much the same manner as the researcher understood the term. The keynote rests upon such explanations of giftedness as: the top one per cent of the school population as measured by a specific and named mean; or, above 140 IQ on a specified scale.

Definitions of giftedness range from very limited aspects of one attribute (usually academic talent) to broad general concepts of any superior ability. The argument at the present time appears to be between two camps; those who would limit giftedness to academic superiority as measured by intelligence and achievement tests, and the other group whose concept of giftedness includes diverse aspects, of which academic superiority is but one. By some definitions, Mickey Mantle would qualify as gifted.

Hiram⁶ feels that giftedness must be viewed as basical-

⁶G. Hiram, "Points of Emphasis in the Teaching of Gifted Children," School and Community, XLIV (October, 1957), pp. 26-28.

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ly intellectual because the role of the school is basically intellectual. While this definition appears to be concise and sensible, it poses two important questions. In view of the new aspects of intelligence and the structure of the intellect, exactly what does intellectual mean to Hyram? Is the role of the school basically intellectual? There are many who would argue that point.

Terman⁷ set the standards for admittance to his gifted group at the highest one per cent in general intelligence as measured by the tests which he employed. He employed both group measurement and the individual Stanford-Binet Scale. By this definition, Terman's group is limited to those students who are intellectually superior, and who can be identified by means of a highly verbal test of intelligence.

Many researchers employ the Stanford-Binet Scale to define their meaning of giftedness. Gallagher shows the cut-off points for various levels of giftedness by Binet IQ standards:

Highly Gifted	148 plus
Gifted	132 plus
Academically Talented	116 plus. ⁸

The necessity of identifying the specific test from which the IQ was derived is shown by Gallagher:

⁷Lewis M. Terman and Others, Mental and Physical Traits of a Thousand Gifted Children, Vol. I: Genetic Studies of Genius (Stanford, California: Stanford University Press, 1925).

⁸James J. Gallagher, Teaching the Gifted Child (Boston: Allyn and Bacon, Inc., 1964), p. II.

Although most IQ tests have established a score of 100 to represent the performance of the average child, scores at extremely high and low levels of the tests have remarkably different meanings.

MAXIMUM OBTAINABLE IQ SCORES ON TESTS OF INTELLECTUAL ABILITY AT TWO DIFFERENT AGE LEVELS

Intelligence tests	Maximum IQ	
	12 years old	14 years old
Stanford-Binet.....	190	167
Wechsler Intelligence Scale for Children.....	154 ^a	154 ^a
Otis Quick Scoring Test of Mental Ability (Beta) ..	153	143
California Test of Mental Maturity (Elementary).....	157	136
Lorge-Thorndike Intelligence Test (Verbal Battery).....	147	150 ^a

^aHighest score given in norm tables.

Similar IQ numbers do not mean similar things, especially at the extremely high levels of the tests. The meaning of any IQ score is obscure unless the user knows the test on which it was obtained and further knows the particular limitations of that test at the extreme levels.

The point illustrated by Gallagher is extremely important. There are vitally different ceilings on different tests. Variations in IQ from one test to another by the same child might be due to the inherent limitation of the test; it might also be due to environmental or emotional factors temporarily affecting

⁹James J. Gallagher, The Gifted Child in the Elementary School (Washington: National Education Association, 1959), pp. 6-7.

the child. The greater fault appears to rest with those individuals who misinterpret the findings of IQ tests. It would appear from this that any person involved in a project dealing with gifted children should have thorough understanding of the measurements employed and the limitations and applications of data derived from such measurements.

Freehill feels that:

For both humane and practical reasons the concept of intelligence (and intellectually gifted) must be generous and broad, including ability in many fields and spreading over a relatively wide range of capacities in any one field. A large number of children must be prepared for the professions, for leadership, for artistic performance, for technical occupations, and for scholarly endeavor. This social requirement and the fact that it is very difficult to make accurate distinctions between unusually gifted and quite gifted makes it appropriate to think not in terms of 2 or 3 per cent of the population but in terms of 10 per cent or more. Gifted has often been applied only to children with IQs of 130 and up. The more generous category will include many below this level of general intelligence although a large percentage will be in the top 2 or 3 per cent in one or more academic fields or intellectual competencies.¹⁰

Freehill is aware of the nation's valuable asset; he recognizes the responsibility of the school to prepare youth for the future. According to his definition of giftedness, more children shall be identified and given an opportunity to develop their potential. Of particular importance is the fact that the end result of identification and training is in adequate preparation for successful adult life.

¹⁰ Maurice F. Freehill, Gifted Children: Their Psychology and Education (New York: The Macmillan Co., 1961), p. 8.

Passow and Goldberg employ the operational definition of talent as:

...the capacity for superior achievement in certain areas of endeavor which have consistently advanced civilization.¹¹

This is a broad concept indeed. Such talents as intellectual superiority, creativity, social leadership, and unusual ability in specific areas of arts and sciences can be included. This is a far cry from "the top one per cent of the school population as determined by the Stanford-Binet scale." While this concept is flexible, it is possible that it is too flexible. Much disagreement could arise from the meaning attributed to "certain areas of endeavor which have consistently advanced civilization."

The crucial aspect regarding studies on the identification of giftedness, talent or superiority rests upon the accurate understanding of the researcher's concept. Until such time as a more universally accepted definition of giftedness is devised, one must accept the individual researcher's operational definition, and evaluate that research from the same point of view.

Before identification of a group is possible, it is necessary to know the characteristics which separate one group from all other groups, and which designate the classification.

¹¹A. Harry Passow and Miriam Goldberg, "The Talented Youth Project: A Progress Report 1962," Exceptional Child, XXVIII (January, 1962), pp. 223-231.

CHAPTER II

CHARACTERISTICS OF GIFTED CHILDREN

The most commonly cited characteristic of gifted children has long been their superior intellectual ability. There are other behavioral characteristics of giftedness to be considered. The search for gifted children should include quantitative as well as qualitative criteria. In view of the changing concepts of giftedness, it becomes necessary to regard many aspects of behavioral patterns that have been found to occur more in above-average groups than in average, or below-average groups.

Characteristics Noted by Terman

Lewis M. Terman's studies on the gifted represent a monumental contribution to education. The study commenced in 1921; it is still going on. There is not another longitudinal study of comparable significance. The study is designed to discover certain characteristic traits of gifted children. Terman summarized those traits which he considered to be important as:

Children of IQ 140 or higher are, in general, appreciably superior to unselected children in physique, health, and social adjustment; markedly superior in moral attitudes as measured either by character tests or by trait ratings; and vastly superior in their mastery of school subjects as shown by a three-hour battery of achievement tests. In fact, the average child of the group had mastered the school subjects to a point about two grades beyond the one in which he was enrolled, some of them three or four grades beyond. Moreover, his ability as evidenced by

achievement in the different school subjects is so general as to refute completely the traditional belief that gifted children are usually one-sided. I take some pride in the fact that not one of the major conclusions we drew in the early 1920s regarding the traits that are typical of gifted children has been overthrown in the three decades since then.

.....
The follow-up of these gifted subjects has proved beyond question that tests of "general intelligence," given as early as six, eight, or ten years, tell a great deal about the ability to achieve either presently or 30 years hence. Such tests do not, however, enable us to predict what direction the achievement will take, and least of all do they tell us what personality factors or what accidents of fortune will affect the fruition of exceptional ability. Granting that both interest patterns and special aptitudes play important roles in the making of the gifted scientist, mathematician, mechanic, artist, poet, or musical composer, I am convinced that to achieve greatly in almost any field, the special talents have to be backed up by a lot of Spearman's g , by which is meant the kind of general intelligence that requires ability to form many sharply defined concepts, to manipulate them, and to perceive subtle relationships between them; in other words, the ability to do abstract thinking.¹

Terman's findings must be carefully analyzed with regard to the following points:

First, the children included in the study were chosen primarily on their ability to obtain a high IQ derived from a test of heavily weighted verbal ability. Does it not follow that this very ability is measured in much the same manner by achievement tests? If the child scored three Standard Deviations above the average child, does it not follow that he should master school subjects in much the same manner and in approximately the

¹Lewis M. Terman, "The Discovery and Encouragement of Exceptional Talent," American Psychologist, IX (June, 1954), pp. 221-230.

same distance from the norm?

Secondly, Terman's criteria appear to be very definitely academically slanted. Is this a representative group of gifted individuals? Terman² noticed a lack of creative individuals in the group when they were viewed at midlife.

Hughes and Converse³ call other warnings to mind. They point out that an amazingly large proportion of widely accepted characteristics of gifted children have been derived from one study. Many decisions regarding the programs for gifted children are based on Terman's findings. Research techniques are more sophisticated now; Hughes and Converse suggest a careful reappraisal of Terman's conclusions in the light of present criteria for research. They contend that the interaction between Terman's selection methods and personality factors affecting achievement caused many potentially gifted children to go unrecognized. This fact is certainly in agreement with recent findings concerning the importance of personality factors and achievement; it is of special significance in regard to low and under-achieving gifted children. Hughes and Converse feel that Terman's method of selection favored higher socio-economic groups; they point out that certain racial and economic groups are not represented in the

²Lewis M. Terman and Melita H. Oden, The Gifted Child Grows Up, Vol. IV: Genetic Studies of Genius (Stanford: Stanford University Press, 1947).

³Herbert H. Hughes and Harold D. Converse, "Characteristics of the Gifted: A Case for a Sequel to Terman's Study," Exceptional Child, XXIX (December, 1962), pp. 179-183.

study. They advocate replication of the Terman study with different guidelines than those employed by Terman. The new plan includes a more consistent and rigorous sampling of the population, careful attention to procedural controls, emphasis on the dimensions of talent, rather than just that talent which is measured by IQ tests. To prove the weight attributed to Terman's findings, they ask the question: "Who has reflected upon the characteristics of giftedness without making a reference to Terman's study?"⁴

Hughes and Converse offer much to contemplate. The questions brought to mind are salient. Practicality invites one further question. Who is to be found to assume such a monumental task?

Freehill synthesizes the characteristics observed by Terman, Lewis, Witty, Lehman and others:

1. The most commonly recognized clue to high ability is precocious behavior or early beginning...The most complex behaviors, other than chance, or accidental behaviors, are probably the best criterion for judging basic ability.
2. Characteristic of superior intelligence is the ability to generalize.
3. A third important clue is the complex of exploration, invention, curiosity, foresight and originality.
4. There is a tendency to self-criticism and moral anxiety.
5. Perseverance which could include self-confidence.
6. Social eagerness--a desire for adult acceptance and generally a social conscience.
7. Giftedness is most likely to be discovered in the environment which encourages intelligent behavior in order to locate the pieces which provide for the greatest

⁴Ibid.

manifestation of intellectual ability.⁵

The concise manner in which Freehill has expressed the characteristics is effective; moreover, his choice of words marks an improvement in the problems of terminology.

Recent Research

Benjamin Fine, headmaster of Sands Point Country Day School, deals only with intellectually or creatively gifted children. His observations are based on research as well as experience. Fine⁶ expects to hear a wide vocabulary range characterized by an early feeling for the accuracy of usage. Curiosity is quite obvious. Contrary to the conclusions of some other researchers, Fine notes the prevalence of creativity in many of his "intellectuals." He mentions that they consistently attempt to conceptualize, to show a love for detail that is new or different. They seem to develop a number of interests that involve much time spent in solitary work; their attention span and powers of concentration are unusual for their ages. They are generally well adjusted and friendly; but, they do tend to establish friendships with children who are older than themselves. Fine is amused to see, even in the youngest three or four year old child, the fondness for and care with which they keep records and notes

⁵Freehill, pp. 42-57.

⁶Benjamin Fine, Stretching Their Minds (New York: E. P. Dutton and Company, 1964), pp. 24-26.

of their observations. Fine avers that the gifted grow and develop, both physically and mentally, at a faster pace than the average child.

Terman, Freehill, Fine and many others have found that the gifted child is generally better developed physically, and usually in good condition of health. Klausmeier,⁷ with Feldhusen and Check, conducted a research to study the relationships among intelligence, psychomotor abilities, and effective characteristics. Their research was quite similar to that which was conducted by Sontag⁸ at the Fels Research Institute. The conclusions reached by both groups were in general agreement; but neither supported the theory that gifted children were superior in physical development.

The Sontag research used the Revised Stanford-Binet Scale as their measure of intelligence. Each child was then measured according to personality and anatomy. The study was a longitudinal one; wide variations in individual IQs were found to exist from one year to the next. The highest degree of stability in IQ was found to exist at two age levels: from ages four to six, and from ages six to ten. The Sontag study reported that rate of physical growth and rate of mental growth were found to

⁷Herbert Klausmeier, "Identifying Children Through Measurement," Education, LXXX (November, 1959), pp. 167-171.

⁸L. W. Sontag, "Mental Growth and Personality Development," Monograph of the Society for Research in Child Development, XXIII (1958), pp. 1-143.

be not related.

The Klausmeier study used the Wechsler Intelligence Scale for Children and the California Achievement Tests in Reading, Arithmetic, and Language as their measure of intelligence. A medical examination by pediatricians revealed no marked differences in the general health of the superior, average, and low groups. (The low groups were drawn from special classes of educably mentally retarded children and did not include any child with any physical handicap. This may account for the above conclusion. It also poses a question: how many previous studies separated the mentally low child from the physically handicapped, mentally low child?) Dental examination by practicing dentists revealed a marked difference in the general dental health of the three groups. Twenty-five per cent of the low group were in satisfactory dental health, whereas forty-three per cent of the average, and eighty-three per cent of the high IQ group were found to be in satisfactory dental health. The child's height, weight, number of permanent teeth and carpal age were found to be not related to IQ or achievement. Klausmeier did note that strength of grip was found to be significantly higher in the high IQ group. He attributes this to the fact that the high IQs are generally more vital; they possess greater energy, they can expend more concentration on a task.

Habitual traits of gifted children are significant characteristics. Eleanor Johnson found that they read earlier and

read widely. She indicates many characteristics that Fine noted: broad interests, creativity, long attention span, a flair for language, intellectual curiosity, powers of analysis, capacity for research, and the ability to work alone.⁹

Lucito¹⁰ conducted an experiment to assess the conformity to peer-group pressure among children of different intellect. He employed the California Test of Mental Maturity Short form, Junior High School level, to distinguish between two groups: bright and dull. The children were then subjected to a series of response situations in which they could conform to the "group's" judgment, which was erroneous, or remain independent. His conclusions revealed that bright children as a group are significantly less conforming to their peers than the dull children in the total situation. The experiment, taken as a whole, indicates that there is an inverse relationship between the amount of conformity and the level of intelligence.

The socio-economic condition of children, while not really a characteristic, is important because of its effect on giftedness. Holland and Stalnaker¹¹ studied National Merit

⁹Eleanor Johnson, Teaching the Gifted Child, Curriculum Letter No. 42 (Middletown, Connecticut: Wesleyan University Publications, 1959).

¹⁰Leonard J. Lucito, "Independence-Conformity Behavior as a Function of Intellect: Bright and Dull Children," Exceptional Child, XXXI (September, 1964), pp. 5-13.

¹¹J. L. Holland and Ruth Stalnaker, "A Descriptive Study of Talented High School Seniors: National Merit Scholars," Bulletin of the National Association of Secondary-School Principals, XLII (March, 1958), pp. 9-21.

Scholars. They found that the majority came from families of high socio-economic status. They further found that eighty-five per cent were from small families and that seventy per cent were first-born. The importance of the pre-school years in the development of the intellect may be a possible explanation to this. In a small family, and especially with a first child, parents are inclined to devote more attention to the child.

Kough and DeHaan compiled a most extensive list of various behavioral characteristics of gifted children.¹² The list enumerates general characteristics of giftedness, and characteristics of special areas of giftedness. The list is significant, not only for its comprehensiveness, but also because it is aimed at the classroom teacher. Much research has insinuated that identification of giftedness by the classroom teacher is one of the least reliable methods; in some cases, researchers have indicated that this method cannot be relied upon at all. Frequently, the teacher is unsure of what constitutes giftedness; in some cases, independence and originality are misinterpreted to mean poor behavior. Kough and DeHaan do not ask for point blank identification from the teacher. They ask that the teacher observe specific behavioral criteria. Those students, so noted, are then to be considered for further identification by specialists.¹³

¹² Jack Kough and Robert F. DeHaan, Teacher's Guidance Handbook, Vol. I (Chicago: Science Research Associates, Inc. 1956).

¹³ See appendix for complete list.

Intellectual Patterns of the Gifted

Is the intellectual pattern of the gifted child different from other children? Does the gifted child view things from a different perspective than other children? Does the gifted child approach a task from a different perceptual or goal orientation? Research has just begun to find some of the answers to these questions. Item analyses of standard tests in construction have frequently found items answered correctly by most of the less bright and by few of the more able. The state of research at the present time indicates that there are different patterns of thinking between the gifted and the non-gifted. The exact and complete dimensions of this difference remain to be found. The reasons for the difference are difficult to ascertain, due in part, no doubt, from the type of measurement in use which tends to favor verbal power or socio-economic status. Previous experience and the effect of both internal and external attitudes may be other variables which can account for the different approaches to the same task.

Gallagher and Lucito¹⁴ conducted a study to determine intellectual patterns among bright, average and retarded children. The classification was determined by the IQ derived from the full scale results of the Wechsler Intelligence Scale for

¹⁴James Gallagher and Leonard Lucito, "Intellectual Patterns of Gifted Compared with Average and Retarded," Exceptional Child, XXVII (May, 1961) pp. 279-482.

Children. Those classified as bright scored in the range of 125 to 145; those who scored in the 90 to 110 range were classed as average, and those scoring in the 40 to 75 range were termed retarded. The individual responses to each examination were then analyzed; sub-scores for each test were analyzed.

TABLE 1

INTELLECTUAL PATTERNS ACCORDING TO THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN - ANALYSIS OF SUBTEST SCORES

	<u>3 Highest</u>	<u>3 Lowest</u>
Bright:	Similarities Information Vocabulary	Picture Completion Picture Arrangement Digit Span
Average:	Arithmetic Digit Symbol Picture Arrangement	Block Design Information Similarities
Retarded:	Object Assembly Digit Span Picture Completion	Vocabulary Information Picture Arrangement

Gallagher and Lucito concluded that the internal consistency of patterns within both the gifted and retarded groups pointed to affirmation of the fact that different levels of intelligence have specific patterns. They noted that the patterns of the retarded were almost "mirror images" of the gifted pattern. The gifted rate highest on verbal comprehension and lowest on perceptual organization. With the retarded, exactly the opposite is true. Looking at the patterns of the average group, one notices that they had a pattern that differed from either the gifted or retarded.

Thompson and Finley¹⁵ wished to compare the Gallagher and Lucito findings with a larger group of children. The measurement which they used was the Stanford-Binet Form L. They patterned their research on a similar study conducted with the same test by Kincaid and Powers in 1960. The Kincaid-Powers study noticed that the superior group excelled in those items which called for verbal fluency and abstract reasoning. The Thompson-Finley study used a much larger sampling. Their findings were in general agreement with the two previous studies. They warned that although broad generalizations may be made regarding the intellectual patterns of both groups, the application of the principles to individuals within each group is highly questionable.

Neuhaus¹⁶ objected to the fact that the Stanford-Binet contains so few items of perceptual and spatial relationships. His study attempted to study the non-verbal pattern of gifted children. The children had been designated as gifted on the basis of their IQ score derived from the Stanford-Binet Scale. Neuhaus administered the Snijders-Oomen Test to them. The Snijders-Oomen Test is not only non-verbal, but requires no spoken or written language on the part of the testor or testee.

¹⁵ Jack M. Thompson and Carmen Finley, "A Further Comparison of the Intellectual Patterns of Gifted and Mentally Retarded Children," Exceptional Child, XXVIII (March, 1962) pp. 379-381.

¹⁶ Maury Neuhaus, "Measuring Non-Verbal Intelligence of Gifted Elementary-School Children," Exceptional Child, XXVIII (January, 1962), pp. 271-273.

It was originally designed for use with the deaf, it is applicable to an age range of three years to sixteen years old. It has sufficient ceiling, and correlates well with the Stanford-Binet and Hunter Scales.

The results of Neuhaus' study have implications for the construction of intelligence tests and for further research. He deduced that the differences in rating of many individuals in the two measurements revealed that the Snijders-Oomen measured an area which the Stanford-Binet did not. That area he designated as space conceptualization, a factor which is basic to success in mathematics, geometry, trigonometry, engineering, and drafting. His data shows that those gifted in verbal reasoning are not necessarily gifted in spatial ability; he suggests that the two areas are but loosely related. Children gifted in areas other than verbal reasoning are unable to obtain a sufficiently high score on the Stanford-Binet Scale to be designated as gifted. He recommends that the Snijder-Oomen be given as a supplement to the Stanford-Binet; in this way, many potentially gifted children will be identified.

Many characteristics have been identified; unfortunately they are not restricted to the gifted. It is unfortunate only in the sense that, in themselves, they do not separate the gifted from the non-gifted. Many of the characteristics observed by researchers are not measurable, at least, by the measurements now in use. Intelligence tests and achievement tests tend to measure

the same things. Tests of creativity are still in the process of being created. Research in the area of characteristics of giftedness warn that there are so many dimensions, no one measurement, nor set of measurements can detect them all. Identification of the gifted must be flexible. As much information as is possible to collect must be considered.

CHAPTER III

INTELLIGENCE AND TESTING

Changing Concepts of Intelligence

What is intelligence? The concept has changed with the passage of years and the refinement of research. Intelligence has been viewed as innate capacity to perform. To some it has been the ability to do abstract thinking, to others it has been the capacity to perform certain fundamental tasks.

Alfred Binet considered intelligence to be "the ability to take and maintain a definite direction, the capacity to make adaptations for the purpose of attaining a desired end, the power of autocriticism." In devising the first intelligence test, Binet translated these abilities into test lines of observable behavior. The items emphasized judgment, comprehension, reasoning, perceptual skills and sensory skills. Of them all, Binet considered judgment the most important.

Terman defined intelligence as the ability to do abstract thinking. Goddard regarded intelligence as "the extent to which one could take advantage of his experience in solving immediate problems and in anticipating future problems." Spearman regarded intelligence as consisting of two factors: the "g" factor, which was common to all mental operations, and the "s" factors, which pertained to specific mental abilities. Terman

was a firm advocate of Spearman's theory.

Thorndike believed that intelligence consisted of multiple factors: abstract intelligence, mechanical intelligence, and social intelligence. He felt that these factors could be measured according to the level of difficulty at which one could solve problems, the range in the number of areas in which a person was competent, the area, and the speed with which one could operate mentally. He devised a test based on this theory; it involved sentence completion, arithmetic reasoning, vocabulary, and following directions.

Thurstone denied the general factor theory of intelligence. He regarded intelligence as composed of a number of "primary mental abilities" which were used to solve problems related to these primary factors. The primary mental abilities he categorized as: verbal, numerical, spatial, word fluency, inductive reasoning, deductive reasoning, and memory.

With the passage of time, the factors of intelligence have increased. The concept has been ever-changing from the theory of one aspect to multidimensional aspects. Guilford has greatly expanded the multiple factor theory. He views intelligence as possessing three faces.¹ His classification of factors is based on operations, content, and products. A great deal of current research and practice employ Guilford's theory. It

¹J. P. Guilford, "Three Faces of Intellect," American Psychologist, XIV (August, 1959), pp. 469-479.

marks one of the most significant contributions of recent time. Guilford's factor analytic studies of intellectual abilities have revealed some eighty distinct dimensions. The logical relationships of these he has organized into a system which he calls the "structure of intellect."² His "morphological model for human intelligence" represents the interacting classes geometrically by a rectilinear model. The vacant cells within the model indicate many more abilities remain to be identified and isolated. He theorizes that the numbers may reach one hundred and twenty or more.

The knowledge concerning the dimensions of intellect as developed by Guilford is of extreme importance in the fields of psychology and education. Certain reappraisals in both testing and training methods are indicated. The Guilford theory will enable aptitude testing to become far more analytical. Areas of intellect, previously ignored or unknown can be investigated. The theory literally "opens the way" in the assessment of creative intelligence. No measurement can ever hope to be perfectly accurate, but the greater the area measured, the closer to truth can it come.

Intelligence, once thought to consist of one or few factors, is now viewed as consisting of multiple factors. A second important change in the concept of intelligence is seen in

²J. P. Guilford, "The Structure of Intellect," Psychological Bulletin, LIII (July, 1956), pp. 267-293.

the stability factor. Intelligence was originally regarded as fairly constant. The use of intelligence measures is based on the assumption that IQ is constant for the majority of individuals. Recent research shows a sizeable fluctuation in many individuals over a period of time. While the causes of fluctuation may vary from one person to another, the fact remains: intelligence is not constant.

Piaget³ studied the developmental differences in children's ability to think. Observation of the development of intellect evidenced emerging stages in abilities. He found built-in limitations at certain levels. He thought persistence of an ability depended upon the opportunity to use it. The greater the variety of situations to which the child must adapt his behavior, the more rapid his rate of intellectual development. Piaget's theories have bearing, not only on the evidence of fluctuation in intelligence, but also on a third changing concept: the question of genetic determination of intelligence.

Piaget's theories are consistent with many recent investigations concerned with the effect of environment on the development of intellectual potential. Genetic determination of potential does not determine to the extent previously believed. Piaget's theories show the rate of intellectual development to be

³Jean Piaget, The Origins of Intelligence in Children, trans. Margaret Cook (New York: W. W. Norton and Co., Inc., 1963).

fundamentally based upon the child's experience with his environment. Of course, there must be something there to be developed. Piaget sets forth a principle which views the relationship between intelligence and experience in terms of motivation.

The changing concepts in regard to intelligence have serious implications, not only for the gifted, but for all children. Early identification becomes vital in view of the influences of environment and experience. Fluctuation in observed IQ test results grants significance to many factors previously regarded as unimportant. Intelligence measures were devised at a period when intelligence was regarded very differently than it is today. This calls for a re-evaluation of measuring instruments and to the importance which may be attributed to the results of measurement.

Intelligence is not subject to direct measurement; it can only be inferred from the response of an individual to a test situation. Intelligence must be viewed through the behavioral aspects of an individual under certain contrived conditions. The result of measurement is but an indication of potential. The two most common individual measurements of intelligence at the present time are the Stanford-Binet Scale and the Wechsler Intelligence Scale for Children.

The Stanford-Binet Scale

The 1905 Binet Simon Scale was devised as a solution to the problem of measuring intelligence; a solution based upon

the conviction that the direct, although crude, measurement of complex intellectual functions was the best means of appraisal.⁴ There were thirty problems arranged in order of difficulty. Binet had long been convinced that judgment, comprehension and reasoning were basic functions of intelligence. The questions were given to fifty normal and some retarded children. The 1908 scale refined and extended the 1905 scale; tests were grouped into age levels; a child's score could be expressed as a "mental age."⁵ It must be noted that Binet's purpose for the scale was to distinguish between "normal" and subnormal children⁶ -- it was not originally intended to distinguish between the "normal" and the above-normal child. Terman's revision -- the Stanford-Binet Scale -- used the Intelligence Quotient for the first time. IQ expressed the ratio between mental age and chronological age. Two important facts must be considered when utilizing the Stanford-Binet to identify children with above-average intelligence: the test was devised at a time when the concept of intelligence was different than it is at the present time, and the standard deviation for above average children has a different

⁴Anne Anastasi, Psychological Testing (New York: The MacMillan Company, 1961), p. 10.

⁵Ibid. p. 11.

⁶Later revisions of the scale attempted to apply the concept of the normal scale so that the test would be applicable to a general population.

significance than for subnormal children.

Terman devised the Binet Scale to measure the following functions: manipulation of objects, observation and identification of common objects, similarities or differences, practical judgment or common sense, memory, spatial orientation, numerical functions, and verbal functions.

In 1959, French illustrated the significance of the Deviation IQ regarding gifted children:

One of the major limitations in the use of a ratio IQ is that the standard deviations of the index are not constant for all ages. This variability of standard deviations often results in incorrect interpretations of test performance. When Terman first made the Stanford-Binet available to the profession, he felt that the variations noted in the standardization data were due to sampling inadequacies. However, research results published in this country and abroad support the proposition that the observed differences in variability from age to age on tests yielding ratio IQs occur from features inherent in the structure of the test.

...A single ratio IQ for all ages will not make possible identification of the top one per cent of the population. If programs are to be provided for a certain stratum of the population as identified by the Stanford-Binet or some other test yielding a ratio IQ, the appropriate ratio IQ for each age level should be identified or all ratio IQs converted to deviation IQs. It must be recognized that not all intelligence tests measure the same thing and that even one test at one age level may not measure the same thing as at another age level. But if the formula presented in the paper is employed in comparing test scores, at least the units of measurement will be comparable.⁷

It is of interest to note that the 1960 revision of the

⁷ Joseph French, "The Significance of the Deviation IQ for Exceptional Children," Phi Delta Kappan, XL (May 1959), p. 325.

Stanford-Binet employed the deviation IQ for the first time. According to Anastasi⁸ the substitution of the deviation IQ for the ratio IQ on the 1960 revision provided the needed rejuvenation for continued use.

Anastasi⁹ reports that the Stanford-Binet scale as a whole measures to a large extent the same functions as the vocabulary test, when the results of the entire test are correlated with the vocabulary section. This fact points once more to the highly verbal content of the test. Anastasi contends that the results of certain analyses indicate that performance on Stanford-Binet items is largely explicable in terms of a single factor; and that single factor becomes increasingly more verbal as the higher age levels are approached. According to Anastasi, the interpretation of the Stanford-Binet IQ is primarily a measure of scholastic aptitude in terms of verbal facility.

Wechsler Intelligence Scale for Children

Wechsler defined intelligence as "a global capacity; the total aggregate ability of an individual to act purposefully, think rationally and deal effectively with his environment." He devised the WISC in 1939 as a downward extension of his adult scale. The scale for children measures the following: informa-

⁸Anastasi, P. 198.

⁹Ibid. p. 198.

tion, comprehension, arithmetic, similarities, vocabulary, picture completion, picture arrangement, block design, object assembly, digit symbol.

The WISC and the Stanford-Binet have much in common. Both are individual tests, both measure general intelligence. Both have a range of task that extends from simple manipulation of objects to abstract thinking. The WISC subtests are supposed to reveal certain mental disorders, whereas the Stanford-Binet is not organized along this line. The standard deviation of the Stanford-Binet is 16, the WISC has a standard deviation of 15. The Stanford-Binet gives age scales, the WISC gives point scales. On the Stanford-Binet items are arranged according to age group, on the WISC they are arranged by type in order of difficulty. The WISC gives both verbal and performance scores from which separate IQs can be computed, the Stanford-Binet does not. The WISC has less floor and ceiling than does the Stanford-Binet; it does not discriminate as well at extreme ranges of the IQ. Brighter subjects tend to score higher on the Stanford-Binet than on the WISC, whereas the exact opposite is true with less bright or dull subjects.

Limitations of Intelligence Tests

The pioneers of testing: Binet, Otis, Cattell, Thorndike, recognized the fact that the IQ test measured but a limited aspect of intelligence -- and measured this aspect in a limited way. Unfortunately, the trend of thinking regarding tests today

seems to ignore this fact. Many charges have been leveled at testing, in general. It would appear that the wrong target has been singled out. The real target is those who misinterpret the result of testing. There are many individuals in responsible positions who do not recognize the limitations of any given test; who do not consider the many variables affecting the testing procedures.

Charles Colton averred that: "Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer." Black¹⁰ and Hoffmann¹¹ would agree. Both have severely criticized tests; their concern was with group tests, rather than individual tests. Standard group tests are widely used at all levels of education. They have particular bearing on the identification of the gifted because many initial screening procedures utilize such measurements. The Pintner-Cunningham Primary Test, The California Tests of Mental Maturity, The Kuhlmann-Anderson Intelligence Tests, SRA Primary Mental Abilities, Otis Quick Scoring Test of Mental Ability are some examples of those frequently used. Most of these are comprised of various items in the multiple choice answer format.

Hoffman is a distinguished physicist and mathematician;

¹⁰Hillel Black, They Shall Not Pass (New York: William Morrow and Company, 1963).

¹¹Banesh Hoffmann, The Tyranny of Testing (New York: The Crowell-Collier Press, 1962).

he served as test consultant for the Westinghouse Science Talent Search for nineteen years. Hoffmann is certainly well acquainted with testing. Hoffmann's book is a warning: objective tests are blocking the search for superior talent. He asserts that these tests "reward superficiality, ignore creativity, and penalize the subtle, probing mind."¹² He deplores the demand made by the structure of the test whereby the student must "select" the best answer with never a chance to give the reason. The investigation by Benjamin Bloom and others regarding "Problem Solving Procedures of College Students" showed that many correct answers were "selected" for wrong reasons; and that many incorrect (according to the manual) answers were selected on the basis of excellent reason.

Hoffmann cites examples from standard tests to illustrate the weakness which he criticizes. He argues mainly against the defects in the tests themselves, the tendency of some test constructors to substitute ambiguity for genuine difficulty, weaknesses of statistical evidence presented by test makers to prove the validity and reliability of the tests. He is very disturbed by the limitations and misuse of the IQ. Hoffman gives many instances to show the manner in which the candidate who knows a great deal about a subject is penalized. He feels that current testing methods tend to repress individuality and that

¹²Ibid. pp. 214-215

test results too frequently misread the performance of the candidate.

Hoffman suggests a need for "fresh vision to the testing situation, especially as it affects those gifted people whose talents do not conform to the statistically based norms of the multiple choice testers."¹³ He pleads that evaluation be of diverse type and that no one particular mean be allowed to play the usurper. "Let us keep open many diverse and non-competing channels toward recognition. For high ability is where we find it. It is individual and must be recognized for what it is, not rejected out of hand simply because it does not happen to conform to criteria established by statistical technicians. In seeking high ability, let us shun overdependence on tests that are blind to dedication and creativity, and biased against depth and subtlety."¹⁴

Gallagher and Moss researched on the new concepts of intelligence, measurement of intelligence and gifted children. Their results¹⁵ concluded that IQ scores are not stable in individual children; in fact, they vary widely during the first ten years of life. They found differences in test results at differ-

¹³Ibid. p. 214.

¹⁴Ibid. p. 215.

¹⁵James J. Gallagher and James W. Moss, "New Concepts of Intelligence and Their Effect on Exceptional Children," Exceptional Children, XXX (September, 1964), pp. 1-5.

ent age levels that indicated that the same intelligence test can measure different cognitive abilities at different age levels. This conclusion is borne out by Piaget's theory of stages in development of intellect of children. Gallagher and Moss repeated the oft-heard warning once more: each test, no matter what its label, measures but a limited amount of the total complex which is referred to as intelligence. They delineated three major functions of tests which are frequently confused by the test users. Intelligence tests can function as predictors of future school success; they can reveal the patterning of ability in individuals; they can give information leading to a classification.

The Gallagher-Moss study explained errors in measurement, practice effects on future testing of the same candidate, errors occurring from incorrect administration of the test, variance in the rate of intellectual growth, as being sources of misunderstanding. They cautioned against the use of intelligence tests for any long range prediction. The exceptional child presents an unusual area of measurement; tests should be constructed for them; they need to be measured by instruments whose validity has been established directly on the group for which they will be used. Much time and research is needed in order to assess the functional value of IQ tests on each type of exceptional child.

The need for construction of an instrument for use with the gifted is urgent. It is ironic to note that so many instruments being used to identify gifted originally were designed to

to separate the underaverage from the average. Much recent research has given evidence of the differences in various intelligence tests; test results of which are used interchangeably. Intelligence tests frequently measure different functions and in different ways. Some differences have occurred due to the differences in the nature of the sample used to standardize the test. There is a further lack of comparability in the difference of units employed in each test. An IQ test with a standard deviation of ten cannot be compared in the same sense with an IQ test having a standard deviation of sixteen. An individual taking both tests could obtain a rate of 120 on one test and 132 on another. It could mean the difference of being included in a gifted program or not, depending upon the cut-off point.

The World Book Company¹⁶ analyzed certain data gathered on high school students who took certain group intelligence tests. Each of the three groups were closely matched; the data was gathered from 1200 cases. Each of the matched groups took one of three widely used group IQ tests: Terman-McNemar Test of Mental Ability, Otis Quick Scoring Test of Mental Ability, Pintner General Ability Tests (Verbal Series). The analysis yielded significant and consistent differences among the obtained IQs. Those from the Pintner were from two to five points lower than those from the Terman-McNemar. The standard deviation of the

¹⁶Anastasi, p. 100.

Otis IQs were found to be lower than the SD of the other two, thus making the Otis IQs fall closer to the mean. An IQ of 66 derived from the Terman-McNemar would correspond to an IQ of 76 on the Otis and an IQ of 141 on the Terman-McNemar would correspond to an IQ of 134 on the Otis.

Reynold's analysis of testing and the new concepts of intelligence indicated that most of the tests in current usage were "g" saturated.¹⁷ He claims that a "g" saturated test will predict a great deal, but it will not always produce the kind of differential prediction wanted. He notes that tests must be constructed in accordance with the nature of intelligence and the structure of intellectual abilities. The tests of personality and character may give enlightenment regarding cognitive processes; those characteristics of personality which have been found by research in creativity should be considered.

Schmeding¹⁸ studied the degree of consistency in group intelligence scores of gifted children, using the scores obtained from the California Tests of Mental Maturity, the Pintner-Cunningham Primary and General Ability Tests. His research was prompted by the fact that there had been very few studies con-

¹⁷Maynard C. Reynolds, "Some Research Related-Thoughts on the Education of the Gifted," Exceptional Child, XXX (September, 1964), pp. 6-12.

¹⁸Robert W. Schmeding, "Group Intelligence Scores of Gifted Children: Degree of Consistency and Factors Related to Consistency," Personnel and Guidance Journal, XLII (June, 1964), pp. 991-996.

cerned with the correlates of giftedness. Schmeding determined the consistency of group IQ scores with a selected sample of gifted children. He wished to determine the effectiveness of using group IQ scores as a screening process in the identification. He wished to study the variables related to gifted children and tests. His findings disclosed that children who scored 120 or higher at some point in the sequential testing program seldom maintained this level in subsequent testing. Due to the variability in scores of children between six and ten years of age, he felt that there was little basis for expecting trustworthy early identification of gifted children, at least by this means. His study noticed that the persistence of giftedness was very much affected by the socio-economic level of the home and by the degree of education attained by the parents, as well as the school achievement of the child. He further found the relation of socio-economic level and the number of children identified as gifted to be high. His recommendations are similar to those of Gallagher, Gowan and others. He urges that testing programs be organized systematically and on a sequential basis. The results of all tests should be faithfully recorded, the record should follow the child. The results of the tests should be given in terms that are comparable if the same series of tests is not used.

Schmeding suggests that the test records be constantly reviewed and checked against other characteristics of giftedness.

He particularly stressed the schools' attitude toward group tests; they are not consistent. The school should guard against the use of any single measure of giftedness, but especially the use of a single test score. He concluded that every effort possible to identify the gifted child must be made; the child should be identified as early as possible. Due to the unreliability and inconsistency of group IQ tests, it becomes necessary to seek other indications of giftedness: creativity, extent of vocabulary, proficiency in abstract thinking. Because only a portion of giftedness can be so identified at an early age, it is necessary to keep reviewing and observing.

The decision of the New York City Board of Education to discontinue the use of group IQ tests in 1964 has its main roots in social forces. It is, however, an indication of the growing mistrust in certain predictive criteria. The decision must be viewed from the local point of view. Nearly one-half of the students in the New York Public Schools can be called culturally deprived.¹⁹ Most tests are constructed with regard to a representative group of the population. The school population of New York City can hardly be classed as "representative." The decision was made on the basis that the tests in use did not apply to the population upon whom they were being used. Both group and individual IQ tests are still in use in those schools that deal

¹⁹Julius Yourman, "Intelligence Testing: The Case Against," Phi Delta Kappan, XLVI (November, 1964), pp. 106-110.

with the gifted children in the New York City schools.

Much of the research and criticism regarding the use of group IQ tests has reached those in a position to correct deficiencies or misunderstandings. Bergesen²⁰ recommends that they no longer be called "intelligence tests."²¹ He suggests that they be "designated by their more delimited reality, e.g., measures of learning ability, or scholastic aptitude, or measure of academic potential; that there is need to revive the awareness of fifty years ago that rapport is the basic premise of all testing and without rapport there is no testing and no score to report."²² He feels that the stress must be placed on the fact that these tests measure present performance. It must also be remembered that recent studies show how much variability exists in the growth and development of children during their first four years at school. According to Bergesen, "intelligent use of intelligence tests" suggests more frequent testing in earlier years with less reliance on any one score, and the development of cumulative and comparative uses of results. In the area of secondary school and college, prediction may be the prime test usage.

The test makers have acknowledged the limitations of tests. Research has been recognized and put into effect. Test

²⁰B. E. Bergesen, Jr., "Once Upon A Time," NCME Newsletter, VII (January, 1965), p. 3.

²¹The Kuhlman-Anderson Intelligence Tests are now called: The Kuhlman-Anderson Tests.

²²Bergesen, p. 3.

companies and publishers of tests have gone as far as changing the name of tests to avoid misconceptions. It remains now for the action to be carried to the school level; teachers and administrators must extend the practice and accept the responsibilities for proper usage and interpretation of test results.

The problems of measurement are many. To measure intelligence is to measure an abstract thing by means of a material rule; it is only the product of intelligence that can be measured. Intelligence has become a many-faceted thing; intelligence tests can be used for the estimate of only few of these facets. At the present time, test makers are in the process of refining and revising. In order to identify giftedness, one must look to other criteria as well as intelligence testing. As with intelligence testing much of the other criteria is limited in certain ways.

Walt Whitman wrote: "I know that this orbit of mine cannot be swept by a carpenter's compass." Herein lies the difficulty of using static tools to measure dynamic qualities; herein lies the danger of equating quantity with quality.

CHAPTER IV

OTHER IDENTIFYING CRITERIA

Creativity and Its Measurement

Research in the area of creativity has been burgeoning; but research knowledge about creativity is somewhat brief. The Utah Research Conferences, under the direction of Calvin Taylor, are held annually and serve as the most outstanding conferences of their type. They aim at the consideration of every aspect of creativity, gather researchers from the entire country and disseminate important research covered during the past year. The conferences have included the most prominent figures in the field of creative research. Guilford sparked much research with the advent of his "structure of intellect." Guilford's work has been concerned in the main with adults. Getzels and Jackson have been involved primarily with adolescents. Torrance has extended the research downward to the elementary level.

According to Taylor and Holland:

The overall pattern of research measuring creative giftedness has not followed the pattern of research on intellectual giftedness. Moreover, some researchers will argue that the burgeoning research movement in creativity, with its broad approach and resistance to premature crystallization, is much healthier than was the intelligence-testing movement, especially for long-range research purposes and for avoiding similar pitfalls.¹

¹Calvin W. Taylor and John Holland, "Development and Application of Tests of Creativity," Review of Educational Research, XXXII (February, 1962), p. 91.

Taylor and others² found that school grades were poor predictors of creative giftedness. This can be explained in part by the fact that so little school work is truly creative or even gives a child the opportunity to do work of a creative nature. There have been several indications that the mere accumulation of knowledge is no guarantee of creativity in the same field.

The conclusion is being reached with more and more frequency that intelligence tests are of very little value in the identification of the creatively gifted. Getzels and Jackson and Torrance reported:

If an intelligence test is used to select top-level talent, about 70 per cent of the persons with the highest 20 per cent of the scores on a "creativity" battery will be missed. Eighty per cent, just ten per cent more, would be missed if the intelligence and "creativity" scores were completely unrelated. Torrance has replicated these findings with less restricted groups in yet unpublished studies. The two so-called creativity batteries, however, were not identical in composition and might more safely be called "divergent-thinking" batteries until they are more adequately validated against suitable external criteria of creativity.³

With regard to the measurement of creativity, it is as yet premature to report with any decisive conclusions. The problem of validity of the measurement creates the most important handicap. Taylor points out that:

The same type of naming problem exists for the so-called intelligence tests. Among the nearly 60 dimensions of the mind discovered to date, more than 50 should now be described as nonintelligence intellectual dimensions,

²Ibid. p. 92.

³Ibid. p. 93.

even though intelligence has been very broadly defined.⁴

It is the belief of Getzels and Jackson⁵ that the essence of creativity appears to be the ability to produce new forms, to conjoin elements that are usually thought of as being unrelated or separate. They warn that the failure to distinguish between convergent and divergent thinking may be disastrous to society.

The Goertzels' biographical study of four hundred famous people⁶ gives much evidence concerning identification of gifted problems. In general, the study showed that the famous persons who comprised the survey did not respond to the school situation as did normal, or average, persons. Three out of five had serious problems regarding school. The Goertzels' study stated numerous instances where some of these children who did not do well in a conventional classroom were able to progress under the guidance of a tutor. A possible explanation, for some, is the one to one ratio. In other cases the difference could be attributed to the fact that the child was regarded as an individual who needed help and guidance as an individual.

⁴Ibid. p. 93.

⁵J. W. Getzels and P. W. Jackson, "The Study of Giftedness," Behavioral Research on Exceptional Children, ed. Samuel Kirk and Bluma Weiner, (Washington: Council on Exceptional Children, 1963), pp. 11-13.

⁶Victor Goertzel and Mildred Goertzel, Cradles of Eminence, (Boston: Little, Brown and Company, 1962).

Due to the lack of correlation between intelligence, as it is presently measured, and creativity, as it is presently being appraised, it appears beneficial for purposes of research that a line of demarcation is being preserved. In an excellent review of recent studies in creativity, Yamamoto pinpoints the most outstanding difficulty as:

Criteria of creativity have received little, if any, consideration from investigators and validation studies are few.⁷

Yamamoto feels that many of the problems besetting investigators in the field of creativity are the very problems besetting investigators in the field of intelligence and its measurement. In both areas, the lack of agreement concerning the most immediate and meaningful criteria is to be deplored. The most easily obtained indicators: school grades, teacher ratings, actual production, current measurements, all have shortcomings. He concludes:

In many studies, reliabilities of instruments are more or less assumed when their validities are examined. It would seem obvious that satisfactory validities are not obtainable until and unless stable and consistent measures are first developed. Intercorrelations between creativity measures and other, more traditional measures of aptitudes, achievement, interests, values, beliefs, and personality, including both the pencil and paper and miniature situation varieties, should be studied intensively to provide a larger and tighter nomological net around this concept of creative thinking. Last but not least longitudinal inquiries must be undertaken both to

⁷Kaoru Yamamoto, "Validation of Tests of Creative Thinking: A Review of Some Studies," Exceptional Child, XXXI (February, 1965), pp. 281-290.

examine the adequacy of various intermediate criteria against the ultimate criterion of some kind or another and also to study relevance of numerous implicit assumptions involved in measurement of creativity, especially among children and adolescents.

Achievement and Its Relation to Identification

School grades and achievement tests are deceptive; they fail to account for environment, preparation, curricular content of courses, psychological blocks to learning, and motivation. Anderson and Slivinske⁹ found a greater generality in the variation of intelligence and achievement as children progress from the fourth to sixth grade. They found that language and non-language types of variation appear more distinguishable and even somewhat inversely related at this age and grade level.

Achievement in school is influenced by many things, not just IQ. Many are the studies that have found intelligence and achievement to be far from perfectly correlated. In a study of age, sex, IQ, and achievement patterns, Norman and others reached the following conclusions.¹⁰ Achievers are significantly younger than nonachievers. They feel that this may be due to the fact that achievers frequently start school earlier than nonachievers;

⁸Ibid. p. 289.

⁹Harry E. Anderson and Alec Slivinske, "A Study of Intelligence and Achievement at the Fourth, Fifth, and Sixth Grade Levels," Journal of Experimental Education, XXXI (Summer, 1963).

¹⁰Ralph D. Norman and others, "Age, Sex, IQ, and Achievement Patterns in Achieving and Non-Achieving Gifted Children," Exceptional Child, XXIX (November, 1962), pp. 116-123.

a second possibility is that the achievers may have been accelerated at some point along the line. Achievers show a significantly higher language IQ and tend to be more significant in the consistency of performance. Norman felt that this might be due to their somewhat better adjustment patterns. On the other hand, the non-achievers show a significantly higher non-language IQ, and surprisingly, a higher total IQ.

Norman used the California Achievement Tests in his study. The sex differences which he noticed inferred that girls were superior in Reading Vocabulary, Mechanics of English and Spelling. There appeared to be no significant sex differences in Arithmetic Fundamentals or Arithmetic Reasoning. Norman concluded that gifted girls followed the usual pattern of their sex, whereas gifted boys did not. When he analyzed the subtest scores for both achievers and nonachievers, he found Arithmetic Reasoning to be significantly higher for both groups. He found Spelling to be the lowest subtest for the nonachievers.

In the analysis of achievement tests as predictive of giftedness, it is necessary to consider many of the same limitations that apply to intelligence tests. Further, it is necessary to consider the structure of the curriculum, the grade levels at which certain things are taught, particularly with regard to math. Many studies of the sex differences in IQ as derived from a particular scale tend to show that there is no difference between boys and girls. What is not usually mentioned is the fact

that care has been taken in the standardization of most intelligence tests to avoid just such imbalance. It is possible that much of the disagreement in research studies is due to this situation; sex differences, which do not show up on an intelligence test will show up on an achievement test.

Achievement tests tend to measure much the same facet of the mind as do the verbal intelligence tests. Are achievement tests better predictors than teachers' marks? One school vehemently says no. The other school, just as vehemently, says yes. Furst¹¹ recounts a number of studies which claim much higher predictive value for previous marks than for standardized aptitude and achievement tests. There is much disagreement concerning this criterion of identification. One point should be remembered. The record of past marks may be a better predictor, than the outright identification of giftedness by an individual teacher.

Teacher Identification

Terman used both teacher nomination and age-grade placement in the determination of those individual children to receive an individual intelligence test.¹² He was well aware of the inadequacy:

¹¹ Edward J. Furst, "The Question of Abuses in the Use of Aptitude and Achievement Tests," Theory Into Practice, II (October, 1963), pp. 199-204.

¹² Joseph L. French, ed., Educating the Gifted: A Book of Readings (New York: Henry Holt and Co., 1959), p. 39.

If one would identify the brightest child in a class of thirty to fifty pupils, it is better to consult the birth records in the class register than to ask the teacher's opinion.¹³

Freehill offers several reasons for the low identity rate of teachers. One, on the basis of personality conflict, is that teachers feel threatened by the very gifted child. Another is because the gifted child may be a disruptive quality in the well-run classroom; he does not conform. He feels that teachers tend to overrate the neat and obedient while they underrate the questioning and independent. Freehill contends that giftedness has an ability to hide, thus making it even more difficult to identify:

Brightness is much less obvious than dullness because gifted people are capable of average behavior whereas the dull are not. Therefore many gifted children do not appear equally distinctive. Many gifted children live in situations that do not elicit verbal, academic, or ingenious behavior commonly marked as a symptom of intelligence. Gifted responses are marked by appropriateness and by the fact that they are induced by small clues. The actual performance or observable behavior may not appear unusual.¹⁴

Freehill notes that there is a need for reliable and valid judgments in order to identify giftedness. He claims that whenever structured and formalized ratings have been used in the place of casual opinions, the results have been excellent. The difference may be in the structure of the rating employed, but Wilson would not agree with this contention of Freehill's.

¹³Ibid.

¹⁴Freehill, p. 35.

Wilson¹⁵ worked with the Special Study Project for Gifted Children in Illinois. Wilson knew the results of much research tended to show that the classroom teacher was not the best means of identifying giftedness. He wished to show that the teacher could be an effective means of identifying the more able in her class if some training were made available to her. This training dealt with established characteristics of gifted children. The actual IQ scores of the children were not known to the teachers. According to the records, fifteen per cent of the school population had obtained a group IQ score of 120 or better, and three per cent had obtained a group IQ score of 130 or better.

In the pretraining evaluation, the teachers selected forty-five per cent of the children in the 120 plus group; but they missed sixty-two per cent of the 130 plus group. During the next few months, training in the characteristics of gifted children was given to the experimental group of teachers. The spring evaluation of identification of giftedness provided both the experimental and the control groups with checklists to help them. The results of the second survey indicated that the teachers were able to identify fifty-seven per cent of the gifted children, but there was no significant difference between the teachers who had attended meetings and those who had not. Wilson

¹⁵Carroll D. Wilson, "Using Test Results and Teacher Evaluation in Identifying Gifted Pupils," Personnel and Guidance Journal, XLI (April, 1963), pp. 720-721.

suggested that judgment variables involved misconceptions of giftedness, personality conflicts and preconceived attitudes. He recommended that screening devices other than teacher judgment be employed; or that teacher judgment be used in conjunction with other criteria.

Tests of Personality and Attitude

Studies in the characteristics of intellectually gifted and creatively gifted children have resulted in additions and refinements of personality inventories. According to Porter¹⁶ some gifted children can be spotted in this way. His studies in the basic differences in the personality patterns of gifted and non-gifted children show the gifted child to be more conscientious, and persevering, more self-reliant and self-sufficient, more resourceful and secure.

DeSena¹⁷ studied the role of consistency in identifying characteristics at three levels of achievement. He found that common non-intellectual factors in the areas of interests, personality, values, personal background, and academic or social adjustment can be identified and characterize definite patterns distinct

¹⁶ Rutherford B. Porter, "A Comparative Investigation of the Personality of Sixth Grade Gifted Children and a Norm Group of Children," Journal of Educational Research, LVIII (November, 1964), pp. 132-135.

¹⁷ Paul DeSena, "The Role of Consistency in Identifying Characteristics of Three Levels of Achievement," The Personnel and Guidance Journal, XLIII (October, 1964), pp. 145-149.

from one another. The three levels were characterized as over, under, and normal achievers. DeSena puts forth the possibility that neglect of the consistency factor may have been responsible for the failure of standardized instruments in previous studies to discriminate among the achievement of different groups.

The personality patterns of the gifted are coming into sharper focus. It is hoped that the recent research, which shows the influence of personality and self-concept to be of utmost importance in the fulfillment of potential, will be included in future personality appraisals. Dizney¹⁸ studied the under-achievement patterns of gifted children. His study involved three thousand children in grades four to seven. He found under-achievement to be more frequent in the very highly gifted than in the moderately gifted. It is of serious consequence that the very finest of minds are not realizing their potential.

¹⁸Henry Dizney, "Underachievement of the Gifted," School and Society, XCI (September, 1963), pp. 30-31.

CHAPTER V

CONCLUSION

Need for Early Identification

At approximately the same time that Binet was devising a scale to measure intelligence, Montessori was developing a method of educating.¹ She developed a psychologically rooted method which rested upon her conviction that every child has a spontaneous urge to learn. This urge is very noticeable at the age of three to four. Montessori found that children paced their own development through a series of sensitive periods when they became acutely aware of language, order, their own senses, the external world. Her method consisted of encouraging these periods to explode into bursts of creativity. Children of three and four would suddenly begin to read and write; they evinced a passionate curiosity about learning. The key to the method is in training the child to take care of himself, to learn for himself at his own pace and in his own way. He must have freedom to express his creativity; he must have freedom to be independent of others.

Montessori's point of origin is the liberation of the inner life of the child. Her basic atmosphere of the educative

¹Maria Montessori, The Discovery of the Child, trans. by Mary A. Johnstone, (Madras, India: Kalakshetra Publications, 1962).

process is freedom. She seeks to free the child that he may fulfill his spontaneous urge to learn; a learning which sees order in the relationship existing between the highest activities of the mind and primitive sense activities. At a very young age, the child taught by the Montessori method learns the right order of things, and experiences the joy of doing correctly, and the satisfaction of having done them by himself.

Notice the manner in which the Montessori method is similar to the levels of development of intelligence as put forth by Piaget. The Montessori method allows the child to create, it does in fact, encourage creativity. Recent studies in the problems of characterizing creativity have blamed curricular content for providing little opportunity for creativity and its expression. The studies concerning personality characteristics of both intellectually and creatively gifted children stress the point that they are more independent and confident than the average child. Montessori's aim is the liberation of the inner life of the child, an aim very much in keeping with Murphy's analysis of teaching.² Murphy's theme is the liberation of intelligence through teaching. Murphy holds that education is a matter of passion:

No effort to free intelligence can be adequate that does not take into account the rich life of impulse, affect, and the unconscious.

...A person's IQ score may be a very imperfect predictor

²Gardner Murphy, Freeing Intelligence Through Teaching (New York: Harper Brothers, 1961).

of his eventual productivity, for a person's image of himself and his level of self-acceptance may be at least as significant as any abstract intellectual potential.³

Montessori stressed the need for early training. She recognized that children are generally ready for much more, much sooner than we believe. She urged that formal schooling begin at two and a half to three and a half years. This is very much in agreement with recent research, especially that of Bloom.⁴ He asserts that a child will have developed fifty per cent of his mature intelligence by the age of four, and eighty per cent by the age of eight.

Despite the limitations found in the entire area of identification of giftedness, the dire need exists; gifted children, even more than normal children, need to be identified as soon as possible. The identificational procedures should include group IQ tests, individual IQ tests, achievement tests, tests of creativity, use of interviews and honor rolls, and teacher nomination; in short, anything and everything that will give as complete a picture of the whole child as is possible.

Guidelines for Testing from Recent Research

It is necessary to utilize standard measurements in the identification of giftedness. Research indicates, that with caution and flexibility, tests can be most helpful. Pegnato and

³Ibid. p. 7.

⁴Benjamin Bloom, Stability and Change in Human Characteristics (New York: John Wiley and Sons, Inc., 1964).

Birch⁵ conducted a study of the relative effectiveness of seven different means in locating gifted children at the junior high level. The first method was that of teacher nomination; teachers identified forty-five per cent of the known gifted children; they included on the list one third of the average children, mistakenly identified as gifted. The second method was an investigation of the Honor Roll; it included seventy-three per cent of the known gifted, but so many average students that it is a poor indication. The third method investigated the interest and achievement in music and art. Of the ninety-one children which the Stanford-Binet signified as gifted, only fourteen were identified by this method; and of the fourteen, all had been included in one or more of the other screening methods. The next method involved the investigation of leadership qualities as shown by membership in the student council. All of those identified as gifted had been identified on the group IQ and most of them appeared in one or more of the other screening devices.

Pegnato and Birch then investigated outstanding performance in math as a criteria. Teachers listed one hundred and seventy-nine as outstanding; of this number only forty were gifted. Analysis of group IQ tests was the next consideration. The test employed was the Otis Quick Scoring, Form Beta. The results showed that if the cut-off point were 130 or better, only

⁵Carl W. Pegnato and Jack Birch, "Locating Gifted Children in Junior High Schools," Exceptional Children, XXV (March, 1959), pp. 300-304.

twenty-one per cent of the gifted would be located. If the cut-off point were 125, half of the gifted would be missed. Pegnato and Birch suggest a cut-off point of 115. Even though some children who are not gifted will be included, further screening by means of individual IQ tests will eliminate those not gifted.

Pegnato and Birch concluded that the group IQ test and achievement tests had advantages for screening purposes, but were of little value for actual identification. They felt that individual tests of intelligence, administered by a psychologist, were the best means of positive identification, if measures of intelligence are the criteria to be used. In another study, Blosser⁶ found the Henmon-Nelson test to be a better screening method for group IQ than the Otis test.

Martinson and Lessinger⁷ studied the identification problem from the point of view of the problems inherent in the situation. They were concerned with the answers to three questions: what measurements should be used? at what age should they be used? what criteria should be considered? Their conclusions and recommendations not only sum up the situation, but present sensible guidelines.

⁶George H. Blosser, "Group Intelligence Tests as Screening Devices in Locating Gifted and Superior Students in the Ninth Grade," Exceptional Children, XXIX (February, 1963), pp. 282-286.

⁷Ruth A. Martinson and Leon Lessinger, "Problems in the Identification of Intellectually Gifted Pupils," Exceptional Children, XX (January, 1960), pp. 227-231.

If attempting to identify the intellectually gifted, use group IQ tests to screen, follow up with individual IQ tests to confirm. Measures of creativity should be used to identify the creatively gifted. Because age is a determinant, identification should begin in kindergarten and first grade; they recommend the Pintner-Cunningham Test and the revised Goodenough Draw-A-Man Test as the group measurements. They recommend the Stanford-Binet as the individual measurement. They urge multiple screening methods, which should include teacher identification and judgment.

The process of identification should be continuous, other standard measures may be used; always investigate the limitations of the measurement, particularly the ceiling. Flexibility and the intelligent use of test results should underscore any decision regarding the identification of giftedness.

When speaking of the gifted and the pioneers of research in the identification and understanding of the gifted, names like Terman, Hollingworth, Witty, Pressey, Torrance, Getzels, Jackson, Gallagher, Taylor, French, and Lessinger come to mind. One would not be inclined to put Plato in this category. Yet there is a beautiful unity to truth and a timelessness to knowledge. There are ancient roots to the most modern of research. Plato saw the importance of identifying the able at an early age, of testing and selecting them, of making them the guardians of the state - the ideal state.

Much of the present research points to the need for very early identification and very early training. Montessori, Bloom, Delcado, Birch and others have designated the presently "pre-school" years as being of vital importance, they have shown the need for methodical, naturally rhythmic development of physical as well as mental faculties. Yet it was Plato who averred that "gymnastic as well as music should begin in early years."

Freehill, Lewis and Piaget recognize the value of observing gifted children while at play, of the significance in their love for dramatic play. Yet Plato said: "Let early education be a sort of amusement; you will be better able to find out the natural bent."

Studies in the social patterns of gifted children show that they tend to seek out friendships with those who are also bright; they are usually quite comfortable conversing with adults. Yet Plato saw that "the wise man will want to be ever with him who is better than himself."

Research by Angelino, Chambers, Drews, McNally and Terman make early identification and early placement in the most advantageous program for the individual a requisite for proper development of the gifted's potential. Yet Plato marked this well: "The beginning is the most important part of the work." And again: "The direction in which education starts a man will determine his future life"

Today we stand amidst an explosion of knowledge, un-

precedented types of research and scientific discovery. It makes one wonder; what is really new?

Appendix

Behavioral Characteristics of Gifted Children: based on Teacher's Guidance Handbook, Vol. I

General

1. Learns rapidly and easily.
2. Uses a good deal of common sense and practical knowledge.
3. Reasons things out. Thinks clearly. Recognizes relationships. Comprehends meanings.
4. Retains what he has heard or read without much rote drill.
5. Knows many things of which most students are unaware.
6. Has a large vocabulary, which he uses easily and accurately.
7. Can read books that are one to two years in advance of the rest of the class.
8. Performs difficult mental tasks.
9. Asks many questions. Has a wide range of interests.
10. Does some academic work one to two years in advance of his class.
11. Is original in his thinking. Uses good but unusual methods.
12. Is alert, keenly observant, and responds quickly.

Scientific Ability

1. Expresses himself clearly and accurately either through writing or speaking.
2. Reads one to two years ahead of his class.
3. Is one to two years ahead of his class in mathematical ability.
4. Has greater than average ability to grasp abstract concepts and see abstract relationships.

5. Has good motor coordination, especially eye-hand coordination. Can do fine, precise manipulations.
6. Is willing to spend time beyond the ordinary assignments or schedule on things that are of interest to him.
7. Is not easily discouraged by failure of experiments or projects.
8. Wants to know the causes and reasons for things.
9. Spends much of his time on special projects of his own, such as making collections, constructing a radio, making a telescope.
10. Reads a good deal of scientific literature and finds satisfaction in thinking about and discussing scientific affairs.

Leadership Ability

1. Is liked and respected by most of the members of his class.
2. Is able to influence others to work toward desirable goals.
3. Is able to influence others to work toward undesirable goals.
4. Can take charge of the group.
5. Can judge the abilities of other students and find a place for them in the group's activities.
6. Is able to figure out what is wrong with an activity and show others how to do it better.
7. Is often asked for ideas and suggestions.
8. Is looked to by others when something must be decided.
9. Seems to sense what others want, and helps them to accomplish it.
10. Is a leader in several kinds of activities.
11. Enters into activities with contagious enthusiasm.
12. Is elected to offices.

Creative Ability

1. Always seems to be full of new ideas pertaining to most subjects.
2. Invents things or creates original stories, plays, poetry, tunes, sketches, and so on.
3. Can use materials, words, or ideas in new ways.
4. Is able to put two or more ideas together to get a new idea.
5. Sees flaws in things, including his own work, and can suggest better ways to do a job or reach an objective.
6. Is willing to experiment to get answers.
7. Asks many questions. Shows a great deal of intellectual curiosity.
8. Is flexible and open-minded. Is willing to try one method after another and to change his mind if need be. Is not afraid of new ideas and will examine them before rejecting them.

Artistic Talent

1. Covers a variety of subjects in his drawings or paintings.
2. Takes art work seriously. Seems to find much satisfaction in it.
3. Shows originality in choice of subject, technique, and composition.
4. Is willing to try out new materials and experiences.
5. Fills extra time with drawing, painting, and sculpturing activities.
6. Uses art to express his own experiences and feelings.
7. Is interested in other people's art work. Can appreciate, criticize, and learn from others' work.
8. Likes to model with clay, carve or work with other forms of three-dimensional art.

Writing Talent

1. Can develop a story from its beginning through the build-up and climax to an interesting conclusion.
2. Gives a refreshing twist, even to old ideas.
3. Uses only necessary details in telling a story.
4. Keeps data organized within his story.
5. Chooses descriptive words that show perception.
6. Includes important details that other youngsters miss, and still gets across the central idea.
7. Enjoys writing stories and poems.
8. Makes characters seem lifelike. Captures the feelings of his characters in writing.

Dramatic Talent

1. Readily shifts into the role of another character.
2. Shows interest in dramatic activities.
3. Uses voice to reflect changes of idea and mood.
4. Understands and portrays the conflict in a situation when given the opportunity to act out a dramatic event.
5. Communicates feelings by means of facial expressions, gestures, and bodily movements.
6. Enjoys evoking emotional responses from listeners.
7. Shows unusual ability to dramatize feelings and experiences.
8. Moves a dramatic situation to a climax and brings it to a well-timed conclusion when telling a story.
9. Gets a good deal of satisfaction and happiness from play-acting or dramatizing.
10. Writes original plays or makes up plays from stories.
11. Can imitate others. Mimics people and animals.

Musical Talent

1. Responds more than others to rhythm and melody.
2. Sings well.
3. Puts verve and vigor into his music.
4. Buys records. Goes out of his way to listen to music.
5. Enjoys harmonizing with others or singing in groups.
6. Uses music to express his feelings and experiences.
7. Makes up original tunes.
8. Plays one or more musical instruments well.

Mechanical Skills

1. Does good work on craft projects.
2. Is interested in mechanical gadgets and machines.
3. Has a hobby involving mechanical devices such as radios, model trains, construction sets.
4. Can repair gadgets. Can put together mechanical things.
5. Comprehends mechanical problems, puzzles, and trick questions.
6. Likes to draw plans and make sketches of mechanical objects.
7. Reads Popular Mechanics or other magazines or books on mechanical subjects.

Physical Skills

1. Is energetic and seems to need considerable exercise to stay happy.
2. Enjoys participating in highly competitive games.
3. Is consistently outstanding in many kinds of competitive games.
4. Is one of the fastest runners in the class.

5. Is one of the best coordinated, physically, in the class.
6. Likes outdoor sports, hiking, and camping.
7. Is willing to spend much time practicing physical activities such as shooting baskets, playing tennis or baseball, or swimming.

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Approval Sheet

The thesis submitted by Patricia Chisholm has been read and approved by three members of the Department of Education.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

8-28-65
Date


Signature of Adviser