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An exploratory study of the use of certain tests of mental capacity with deaf-blind children

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Stenquist, G. M.
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Thesis

AN EXPLORATORY STUDY OF THE USE OF CERTAIN TESTS
OF MENTAL CAPACITY WITH DEAF-BLIND CHILDREN

Submitted by

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CHAPTER I
INTRODUCTION

1. Introductory Statement

"The field of the deaf-blind is unique in many ways. It is unique in that the children who are deaf-blind are so totally handicapped; it is unique in that those persons who are to work with these children are required to have a highly specialized, intensive training which often seems to have little relationship to one's own educational experiences or previous academic learnings; it is unique in that the attitude of the public (and allied professional personnel, too) is apt to be more at variance with that which would be considered desirable from the viewpoint of understanding, tolerance and objective acceptance; it is unique in that the medical, psychological and educational techniques utilized in the diagnosis of these children have smaller relationship to available standardized instruments, have been little developed, or indeed, in certain instances, have not been developed at all."^{1/}

It is in relation to this last mentioned area, the area of evaluation with the deaf-blind, and specifically in the area of intellectual evaluation, that this thesis is concerned. The need to assess available instruments and techniques in order to better determine their applicability in diagnosing deaf-blind children; the need to consider the existing possibilities concerning the development of newer or different techniques; and the need to assess the available procedures from the viewpoint of amalgamating those items from the various tests which have highest validity as determined by

^{1/}Albert T. Murphy, The Dynamics of Neurotic Communication, Address given at the Institute on Current Psychological Issues, San Diego State University, San Diego, California, July 26, 1958.

practical utilization with deaf-blind children, are extremely pressing ones. This thesis attempts to begin to satisfy, in at least a small way, those needs.

2. Justification

From a narrow viewpoint, there seemed to be a need for the writing of this paper in order that the writer, through the compilation of her thoughts and endeavors concerning the evaluation of the mental capacity of deaf-blind children, might more easily assess her work up to the present time and plan wisely for her efforts in the future.

Taking a broader view, it is hoped that this aggregation of material may prove to be of value to other people similarly engaged in the attempt to evaluate the intellectual function of children characterized by lack or serious impairment of both vision and hearing. Also, it is hoped that others may be motivated to extend their efforts in this area and to write of their findings, thus contributing to a field singularly lacking in research and in literature.

3. Scope

Main areas of discussion.--This paper is concerned with the following topics: (1) a review of the development of the concept of evaluating the deaf-blind in regard to mental capacity and a review of the literature pertinent to this concept; a review of the literature on the use of certain standardized tests with the deaf and with the blind; a review of other significant literature; (2) a description of the deaf-blind

population; (3) a discussion of the tests and the presentation of the test material in arrangements useful for the examiner; (4) a discussion of procedures and of problems involved in the administration of these tests and in the interpretation of test results; (5) suggestions as to the usefulness of the various tests and of what may be learned concerning deaf-blind children through the use of the tests; (6) general considerations, conclusions and implications for further research.

Definition of term "deaf-blind".--Before proceeding further, it seems wise to clarify our thought as to what we mean by "a deaf-blind child." The following quotation meets this need for clarification:

"The National Study Committee recognized that there is a wide range of disabilities involved in this double handicap, and defines a deaf-blind child as one whose combination of handicaps prevents him from profiting satisfactorily from educational programs provided for the blind child or the deaf child."1/

1/Report of the National Study Committee on Education of Deaf-Blind Children, January 25-26, 1954, Council Bluffs, Iowa, p. 28.

CHAPTER II

A REVIEW OF THE LITERATURE PERTINENT TO THE EVALUATION OF THE MENTAL CAPACITY OF THE DEAF-BLIND

1. Introduction

Dr. S. R. Silverman, Director of the Central Institute for the Deaf, has made the following statement in regard to work with the deaf:

"In our latter day concern for psychological and auditory assessment and diagnosis through various testing techniques, we seem to have attenuated our interest in practical educational techniques to the point where the testing fringe is getting larger than the teaching cloth. This trend, fortunately, has not been without its significant value. It has led to early detection and assessment of the deaf child and consequently to wider acceptance of the value of instruction at the pre-school level."^{1/}

Borrowing this apt idea of teaching cloth and testing fringe may help to clarify the picture of the testing situation with the deaf-blind. Here the cloth is a newer one than that of which Dr. Silverman writes, for efforts to teach the deaf-blind were made at a later date than were efforts to teach the deaf. Also the teaching cloth for the deaf-blind had no fringe at all until comparatively recently when attempts were initiated to evaluate the mental capacity of these doubly-handicapped, and often multiply-handicapped children. At the present time, this cloth has only a narrow fringe, and the process of

^{1/}S. R. Silverman, in Foreword of Language for the Preschool Child, by Grace Lassman, Grune & Stratton, New York, 1950, p. X.

widening it is so fraught with difficulties that the possibility of its becoming wider than the teaching cloth seems very remote. Nevertheless, "artisans," if such we may call the psychologists and research workers in the field--and perhaps we may do so when we consider Newland's statement that "the determination of the mental level in such cases (the severely handicapped) tends more to be an art than a science,"^{1/} --are endeavoring to improve the fringe until it becomes of a size in good proportion to the teaching cloth and of a satisfactory quality.

The relatively short history of these endeavors as well as the literature concerning them will be briefly summarized here.

Before proceeding to this, however, one further reference to Dr. Silverman's discerning statement seems in order: The value of the enlargement of the testing fringe for the deaf seems equally present in the development of tests for the deaf-blind, for here, too, such enlargement leads to early detection and assessment and to a wider acceptance of the possibility and value of instruction of deaf-blind children.

2. Review of Events and Literature Concerning
the Mental Evaluation of the Deaf-Blind

Dr. Samuel Gridley Howe undertook the education of Laura Bridgman, a deaf-blind girl, in 1837. Since that time a fairly

^{1/}T. Ernest Newland, "Psychological Assessment of Exceptional Children and Youth," Chapter II in Psychology of Exceptional Children and Youth, William M. Cruickshank Editor. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1955, p. 114.

large number of similarly handicapped children have been educated, with varying degrees of success, and an impressive amount of literature has been written about these children and their problems and education. Attempts to evaluate the mental capacity of the deaf-blind have appeared only recently, however, and the literature in this area is indeed sparse; to continue our metaphor, the cloth is only just beginning to be fringed.

Perhaps the most logical and concise way to summarize the events and the literature in regard to the intellectual evaluation of the deaf-blind is to list chronologically the most significant happenings and writings up to the present time:

1951.--Dr. Edward J. Waterhouse became the Director of Perkins School for the Blind. Concerned by the lack of means of evaluating the educational potential of deaf-blind children, he began devoting time and effort to the consideration of this problem.

April, 1953.--Conference of Educators of Deaf-Blind Children was held at Watertown under the joint sponsorship of the American Foundation for the Blind and Perkins School for the Blind. This conference was to quite a degree the result of Dr. Waterhouse's eagerness to revitalize the education of deaf-blind children and to instigate research as to estimating their mental capacity. "The need for research was emphasized, particularly into methods of evaluating the deaf-blind."^{1/}

^{1/}Edward J. Waterhouse, "Report of the Director," in The One Hundred Twenty-seventh Report, Perkins School for the Blind, Watertown, Massachusetts, 1958, p. 38.

At this conference a paper was read by the Headmaster of Condoover Hall School, England, on the subject of the deaf-blind child's educability. The presence of this topic on the agenda is indicative of the incipient interest in the matter of evaluation. The speaker said, "It would be too much to hope that there was an Intelligence Test for deaf-blind children. I presume that we can only observe, and see in what way the children seem to be behaving intelligently."^{1/} However, he went on to indicate that at Condoover Hall, strivings are being made to assemble a scale for evaluation purposes.

July, 1953.--The first meeting, an organizational one, of the National Study Committee on Education of Deaf-Blind Children was held at Washington, D. C. This committee was created at the Conference of Educators of Deaf-Blind Children previously mentioned.

January, 1954.--The second meeting of the National Study Committee was held at Council Bluffs, Iowa. Various problems for research were suggested, the pertinent one here being: "The adaptation of psychological tests and measurements to make them applicable for use with the deaf-blind (or the development of new tests?)"^{2/}

1/S. O. Myers, "Means of Determining a Deaf-Blind Child's Educability," in Conference of Educators of Deaf-Blind Children, Perkins Publication No. 16, January, 1954, p. 39.

2/Report of the National Study Committee on Education of the Deaf-Blind, Washington, D. C. - July, 1953 at Council Bluffs, Iowa - January, 1954, p. 10.

At this meeting, Helmer R. Myklebust, later to enter upon an evaluation program at Perkins School for the Blind, made tentative remarks about deaf-blind children "explaining that they were based on very limited opportunities for observation."^{1/}

January, 1954.--Publication in the New Outlook for the Blind of the Article, "National Approach to the Education of Deaf-Blind Children" by Annette B. Dinsmore, Consultant, Services for the Deaf-Blind, American Foundation for the Blind. This is an excellent resumé of the proceedings of the 1953 meeting of the National Study Committee on Education of the Deaf-Blind, as well as a plea for more research.

March, 1955.--First visit at Perkins, at the invitation of Dr. Waterhouse and the Trustees, of Dr. Helmer R. Myklebust of Northwestern University for the purpose of undertaking diagnostic procedures with deaf-blind children. A series of five visits was made between 1955 and 1958, and during this time the initiative and guidance of Dr. Myklebust were of inestimable value to the Perkins staff and to the cause of evaluation in general.

June, 1955.--Workshop for Teachers of Deaf-Blind Children was held at Hartford, Connecticut, under the sponsorship of the American Foundation for the Blind in cooperation with the National Study Committee on Education of Deaf-Blind Children.

1/Report of the National Study Committee, op. cit., p. 15.

The need for evaluation of deaf-blind children was one of the major issues. A report of the proceedings has been published.^{1/}

1955.--Publication of Special Education for the Exceptional, written by Merle E. Frampton and Elena D. Gall. Volume II deals with the physically handicapped. Frampton discusses the education of the deaf-blind but does not touch upon mental evaluation. Gall writes briefly of the 1953 meeting of the National Study Committee on Education of Deaf-Blind and its recommendation for research concerning psychological tests and measurements.

1956.--Publication of The Deaf-Blind Child, by Helmer R. Myklebust. This book constitutes a unique and invaluable contribution to the field. Myklebust believes that the deaf-blind child "must be viewed diagnostically in terms of his total functioning and not just in terms of the major areas of handicap, deafness and blindness. The diagnostic approach assumes that the deaf-blind child is an altered organism as a whole and thus must be appraised in terms of his total behavior and integrity."^{2/} He divides the diagnosis of the deaf-blind child into the areas of residual sensory capacities, neurological capacity and psychological capacity. The psychological examination is constituted of the study of mental capacity (with which we are primarily concerned in this paper) emotional

^{1/}Workshop for Teachers of Deaf-Blind Children, at Hartford, Conn., June 27, 30, 1955. American Foundation for the Blind, New York, 1956.

^{2/}Helmer R. Myklebust, The Deaf-Blind Child, Perkins Publication No. 19, Perkins School for the Blind, Watertown 72, Massachusetts, 1956, p. 10.

development, social maturity, motor functioning, and language development. Dr. Myklebust's efforts form a definite step forward in the evaluation of the intellectual functioning of deaf-blind children and are the helpful and courage-giving groundwork upon which further attempts have been based.

March, 1956.--Publication in the Perkins Lantern of an article written by Edward J. Waterhouse, "Problems of Diagnosis." The need for effective diagnosis of deaf-blind children is stressed as well as the difficulties involved in such diagnosis. After Dr. Myklebust's first visit, Waterhouse writes,

"Dr. Myklebust then came to Perkins where he spent a day or two making a careful study of each child, talking with our staff, and also, in some cases, with the children's parents. He then analyzed the problems of each child for our staff and for representatives of a number of other agencies who were interested.

"Our Trustees, and particularly our President, Dr. Augustus Thorndike, were satisfied that this program should be repeated during the next five years. We hope in that time to develop procedures which can be widely copied at different clinics throughout the United States.

"While we cannot foretell the final results of this program, the first session did have one helpful result. We found that in no case did Dr. Myklebust's recommendations differ markedly from those of our own staff. It is true that our teachers did not have any really scientific basis for their recommendations, but it is encouraging to find that careful observation of deaf-blind children by trained and experienced teachers is apparently a valid diagnostic tool.

"We should, however, remember that, so far, only a small number of deaf-blind children have been included in this program, and further experience may reverse our present findings."^{1/}

^{1/}Edward J. Waterhouse, "Problems of Diagnosis," in The Lantern (March 15, 1956), Volume 25, Number 3, Perkins School for the Blind, Watertown 72, Massachusetts, p. 8.

September, 1956.--The appointment of a person (the present writer) to full-time research in the Deaf-Blind Department at the Perkins School for the Blind.

November, 1956.--The dedication, by Helen Keller, of the Keller-Macy Cottage, the school building of the Deaf-Blind Department at Perkins School for the Blind. The plaque placed at the doorway outlines the three-fold purpose of educating deaf-blind girls and boys, training teachers, and performing research. The inclusion of the last named purpose testifies to the increasing recognition of its importance.

March, 1957.--Publication of the article, "What Do You Mean 'Hopeless'?" in the Saturday Evening Post. This account, by Don Murray, of deaf-blind children, their problems, and their education at Perkins is quite comprehensive, and special attention is given to the area of evaluation. Murray writes, "The first step-----is to assess a deaf-blind child's mental and social potentials. This is not easy. There are still no I. Q. tests, no standard intellectual measurements for children with this double affliction."^{1/}

July, 1958.--International Congress on Modern Educational Treatment of Deafness held at Manchester, England. A paper, "The Educational Treatment of the Deaf-Blind in the United States," was read by Daniel J. Burns, Head of the Department for Deaf-Blind Children, Perkins School for the Blind. This

^{1/}Don Murray, "What Do You Mean 'Hopeless'?" in The Saturday Evening Post (March 2, 1957), Volume 229, Number 35.

paper subsequently was printed in the 127th Annual Report of Perkins. It contains a section on mental evaluation of deaf-blind children and gives a brief outline of tests being used exploratively at Perkins.

July, 1958.--Workshop in the Education and Development of the Preschool Deaf-Blind Child at Syracuse University. The writer, as consultant, read a paper on the evaluation of deaf-blind children in which Dr. Myklebust's approach to the evaluation of deaf-blind children was summarized. Within this frame of reference, the examination of mental capacity was discussed with the main emphasis placed on the newness of the field, the needs for careful choice and use of tests, and the importance of qualitative, rather than quantitative interpretation of findings.

September, 1958.--The series of visits by Dr. Myklebust being concluded, Perkins begins its own independent evaluation program based on the suggestions of Dr. Myklebust and under the guidance of Carl Davis, Head of the Department of Psychology and Guidance at Perkins.

November, 1958.--Perkins evaluation "team" of four members carries out its first screening program away from the Perkins campus at the Industrial Home for the Blind in New York. Eight children were evaluated as to educability.

December, 1958.--Publication in the Perkins Lantern of an article written by Edward J. Waterhouse, "Evaluation of Deaf-Blind Pupils." This includes a brief discussion of the

difficulties involved in evaluation; the danger of erroneously diagnosing deaf-blind children as mentally defective; the unhappy fact that some are mentally defective; the five-year plan with Dr. Myklebust; the present attempt to find satisfactory evaluation tools.

March, 1959.--Publication in South Africa of an article by Hermina C. M. van Rensberg of the School for the Blind in Worcester. Title: The Education and Care of the Deaf-Blind. This is a report on observations made during a study tour in the United States, and the Perkins program of evaluation of mental ability is discussed at some length.

April, 1959.--The Perkins evaluation group traveled for the second time to screen a group of deaf-blind children, this time at the Children's Rehabilitation Unit of the Kansas University Medical Center at Kansas City, Kansas. Edward J. Waterhouse has written of the fact that all of the children seen at Kansas have some usable vision. He points out the difficulties of finding the proper place in which to educate such children who need so much individual attention that schools for the deaf and schools for the blind cannot provide for them properly in their regular classes. He commends the schools for the deaf which attempt to accommodate visually impaired deaf children, but concludes that "a highly specialized program such as that designed for deaf-blind children is necessary and that at the present time existing deaf-blind departments seem to be the most suitable placement."^{1/}

^{1/}Edward J. Waterhouse, "A Visit to Kansas" in The Lantern (June 15, 1959), Volume 27, Number 4, Perkins School for the Blind, Watertown 72, Massachusetts, p. 14.

April, 1959.---The publication of the article, "A New Plan for Kansas" by Betty G. Riley in the New Outlook for the Blind. Here a description is given of how the extreme needs of a severely handicapped child led to the development of a plan for a statewide program important in the coordination of services to blind and deaf-blind children. The author stresses the fact that principles and standards of diagnostic evaluation must be based on research findings and anticipates the development of such research in the near future.

1959.---The Publication of A Report of Psychological Studies with Deaf-Blind Persons. This is Volume IV of the series, Rehabilitation of Deaf-Blind Persons, a joint project of the Office of Vocational Rehabilitation, U. S. Department of Health, Education, and Welfare and the Industrial Home for the Blind. This report was written by Jacob Rothschild, psychologist at the Industrial Home for the Blind. It is the result of the most thoughtfully planned and competently executed psychological effort with handicapped subjects with which the writer is familiar. Although it was conducted with adults and our present problem is concerned with the psychological testing of children, it suggests many procedures and attitudes which are of value in the evaluation of young deaf-blind individuals. The study as a whole involves the administration of tests of manual dexterity and of projective techniques as well as of intelligence tests. In the area of intelligence testing, Rothschild used the Wechsler-Bellevue Scales, Form I, Verbal Scale and the Hayes-Binet Intelligence Tests for the Blind. He used a range of

approaches in order to adapt the mode of communication to the client's abilities in this respect. These approaches included: The one hand manual alphabet; personal interpreter; printing on the palm; Tellatouch; test material in large print. All of this is most interesting in relation to the subject of the present thesis because with the deaf-blind children whom the writer has attempted to evaluate intellectually, it has almost always, except in a few cases, proven to be impossible to administer verbal scales due to lack of ability in communication and to lack of knowledge of the language necessary for the understanding or answering of the test questions. Performance rather than language tests have had to be the rule almost entirely. Rothschild, however, does say that the Hayes-Binet Intelligence Tests for the Blind were administered to only two-thirds of the group because for the remaining one-third, the problems of communication were so serious that valid scores could not be obtained.

The reading of this report is strongly recommended by the writer to those interested in the psychological evaluation of the deaf-blind of any age. Rothschild has a rare sensitivity to the problems presented by deaf-blindness and an encouragingly optimistic attitude toward the feasibility of undertaking the testing of the mental capacity of the deaf-blind. His work stands alone as the one major effort concerning the mental evaluation of the adult deaf-blind, and his success and optimism brighten the whole picture for doubly-handicapped children as well as adults.

1959.--The publication of A Report of the Committee on Services for the Deaf-Blind to the World Assembly of the World Council for the Blind (held at Rome, Italy, in July, 1959).

The main purpose of this report is to give the findings related to communication and to basic minimum services for deaf-blind persons throughout the world. In addition, in Appendix E, we find described the seven volumes of the Rehabilitation of Deaf-Blind Persons of which Volume IV, A Report on Psychological Studies, has been mentioned here. (See above.)

June, 1959.--Convention of American Instructors of the Deaf held at Colorado Springs, Colorado. In the session concerned with multiple handicaps, Daniel J. Burns, Head of the Deaf-Blind Department at Perkins, was leader for a group discussion on the topic: "Evaluation and Education of Deaf-Blind Children in the United States." At this writing, no report of the proceedings of the convention has been published.

In concluding this review of events and literature concerned with evaluation of the intellectual function of the deaf-blind, a salient impression is that a large part of the writing on this subject has issued from Perkins School for the Blind and especially from the pen of Edward J. Waterhouse whose sincere and inspiring interest seems to have been the source from which increasing research has begun to flow. It was he who asked Dr. Myklebust to slant his past experience with deaf and otherwise handicapped children toward the study of the problem of the diagnosis deaf-blind children. In fact, it might

be said that Dr. Waterhouse's keen interest and Dr. Myklebust's rare knowledge constitute the platform for subsequent research in this area.

3. A Review of the Literature Pertinent to the Use of Certain Standardized Tests with the Deaf and with the Blind and a Review of Other Related Literature

Purpose of the review.--The purpose of this review of literature was not to find statistics as to intelligence levels of those who are deaf or of those who are blind nor to make relative comparisons concerning their intellectual ability. Instead, it was to determine whether or not the chosen tests had been used with the blind or with the deaf and if so, to name those instances for further study by the reader.

Results of the review.--The perusal of the literature reveals that the tests have been used to varying extents with the visually handicapped and the auditorially handicapped. References concerning these undertakings may be found in Appendix A together with more general references which the writer has found helpful and significant in regard to the testing of the deaf and of the blind, references which give enlightening discussions concerning the use of the tests we are considering. The reading of this material has impressed the writer with the possibilities and the values of measuring the mental capacity of the deaf and of the blind. These possibilities and values have permeated her view of the situation concerning those who are both deaf and

blind, that is, the deaf-blind, and are inspiring and encouraging. (See Appendix A.)

CHAPTER III

PROCEDURE

1. Study of the Population

After the review of the literature was concluded, the first undertaking was the study of the characteristics of the population of deaf-blind children. The twenty-five children in the Deaf-Blind Department at Perkins School for the Blind were observed as to the many variables present. Subsequently, the same study was made of groups screened at New York and Kansas, but the results of the latter study are not included here. Particular attention was given to the amount of usable vision and usable hearing, factors of utmost importance in the choice of performance or verbal tests. Age, also, was a consideration in order that useful tests or test items might be chosen. In accordance with the findings, classifications of children were made according to amount of vision and hearing. These groupings facilitate the choice and use of tests.

2. Choice of Tests for Exploratory Use

On the basis of suggestions of Dr. Myklebust, of information revealed by the literature, and of experience, certain tests were chosen as the ones to be attempted with deaf-blind children. Standardized tests, with their solid background and wide acceptance seemed the best basis for this initial venture.

into the field of evaluating the deaf-blind even though it was realized that much consideration would have to be given to the fact that except for the Maxfield-Fjeld Tentative Adaptation of the Vineland Social Maturity Scale, the Interim Hayes-Binet Tests of Intelligence, and the Ontario School Ability Examination for the Deaf the tests were standardized on a normal population. It was not expected that complete scales could be used except in occasional cases, for the following statement made of the deaf by Dr. Myklebust, is even more true with those who are blind as well: "It is not common to use all of the items in any one test-----but selected items from various tests can be used according to the child's level of cooperation and the problem which he presents."^{1/}

3. Arrangement of Test Material

For facility of use, the tests were arranged in various ways which seemed logical and convenient. For example, usable items within each test or scale were listed chronologically; usable items for all the tests were amalgamated and listed chronologically; items were listed according to their appropriateness for totally blind children or for children with usable vision; items were grouped according to type. (These arrangements are given in the Appendix.)

^{1/}Helmer R. Myklebust, Auditory Disorders in Children, Grune and Stratton, New York, New York, 1954, p. 301.

4. Administration of the Tests

Over a period of many months, the tests were administered in whole or in part (with some children only one or two items are usable) to approximately forty children. Of this group, the children in the Deaf-Blind Department at Perkins constitute the majority. Others were the children evaluated at the Industrial Home for the Blind in New York and at the Children's Rehabilitation Unit, Kansas University Medical Center in Kansas.

5. Notation of Procedures and Problems

As the testing program was carried out, note was taken of the usefulness of the chosen tests, difficulties and problems in administration and the extent to which the use of standardized procedures was possible. Also the relative value of quantitative scorings and qualitative observations were considered. Different procedures were found to be necessary with the different classifications of children and were compiled for reference and use.

6. Rationale

Next an attempt was made to be clear as to why the different tests had been chosen and what we hoped to learn about the deaf-blind child through the administration of the various types of tests and from the testing situation in general. Thoughts in this area came as a result of the actual testing experience combined with a knowledge of the literature on the testing of deaf, of blind, and of otherwise exceptional children as well as the normal.

7. General Considerations and Implications for Further Research

Finally, an effort was made to draw from all the accumulated experience and information some generalizations and "specializations" which might clarify and crystallize the writer's own thinking and at the same time widen the testing fringe on the cloth for the field as a whole. Ideas for further research, a "must" if there is to be progress, also have been considered and suggested with the hope that they may be investigated in the near future.

CHAPTER IV
PRESENTATION OF DATA

1. The Population

The many variables.--The twenty-five children in the Deaf-Blind Department at Perkins School for the Blind present a varied picture as far as age, degree of handicap, age of onset of handicap, etiology of handicap, additional physical handicaps, emotional behavior, social maturity, language behavior, motor ability, and accultural background are concerned. All of these are of extreme importance and must be carefully considered in the evaluation of test results. For the purpose of this thesis, however, our main concern is with the presence or absence of useful vision or useful hearing and, to some extent, with age of the child in order that the desirability of visual or non-visual performance tests, of verbal or non-verbal tests, and of tests of different age levels may be determined.

Age.--Within the deaf-blind department, the age range is from six years through nineteen years at the present time. Actually, the age of the child is not often of much import because the child's handicaps, abilities, and previous background all influence the choice of tests more than does his age.

Hearing.--Concerning the amount of hearing found among the twenty-five children being considered, the picture is a

complicated one. Hearing losses appear to range from profound in the majority of cases to moderate in a few cases, but because of the many difficulties involved in the measurement of the hearing of these children, all results must be considered as estimations only. A contributing factor to the vastness of the problem is the possibility that apparent hearing losses may be due to causes other than peripheral deafness, for example, to psychic deafness, to aphasia, and to mental retardation.^{1/} For our purpose here, we are concerned only with whether or not there is sufficient useful hearing for the administration of verbal tests. Of the twenty-five children, only two children were found to have sufficient hearing and knowledge of language for verbal tests.

Vision.--Concerning the amount of vision, also difficult to determine in a group such as this, thirteen of the twenty-five have vision which is useful in a test situation, eight are totally blind (of these two appear to have light perception), and four appear to have some form perception.

National picture.--The above distribution of vision and hearing is not surprising in view of the fact that a similar situation may be observed among the deaf-blind children listed on the register at the American Foundation for the Blind.

Annette Dinsmore, Consultant in the Department for Special Services for the Deaf-Blind, has written that "...only one-fourth to one-third (of the children whose names are on the

^{1/}Helmer R. Myklebust, Auditory Disorders in Children, Grune and Stratton, New York, 1954, pp. 103-234.

register) are totally blind and deaf, while a smaller portion have been so from birth. The highest percentage seems to be those who have been deaf from birth, that is, unable to acquire speech and language through hearing, with a partial loss of vision."^{1/} The Perkins group adheres to this national pattern in that eighteen of the twenty-five are known to have congenital impairment of hearing and vision. In fact, it is the opinion of the writer that the population of deaf-blind children at Perkins presents on a small scale, an amazingly consistent facsimile of the nation-wide population of deaf-blind children.

It is interesting to note that the eight children screened at the New York evaluation and the ten children seen at Kansas presented cross-sections of the population very similar to the national listing in this respect of being characterized by a large percentage of usable vision. In fact, as noted in Chapter I all of the Kansas children have some usable vision.

Classifications of children.--For convenience in the use of the tests, the following classifications within the population of the deaf-blind children are suggested:

Group 1:

Those children who are blind, deaf or hard of hearing, and to whom some psychological tests may be administered.

^{1/}Annette B. Dinsmore, "National Approach to the Education of Deaf-Blind Children," in The New Outlook for the Blind (January, 1954), 48:1-8.

Group 2:

Those children who have usable vision, are deaf or hard-of-hearing, and to whom some psychological tests may be administered. (It should be noted that tests usable with Group 1 may also be used with Group 2, but not vice versa.)

Group 3:

Those children whose degree of visual and auditory handicap may or may not be as determinable as those in Groups 1 and 2, but to whom, due to lack of ability of willingness to cooperate, no psychological tests may be administered. (This is usually the very young child, but occasionally an older child falls in this category.)

Usable Speech.--Rothschild, in working with the adult deaf-blind, used the added categories of "usable speech" and "no speech."^{1/} We are omitting any classification as to presence or absence of speech because speech with the deaf-blind children whom we have seen is rarely at a level satisfactory for use in a testing situation. It should be understood, however, that occasionally a child termed "deaf-blind" will have enough skill in language and ability in speech to be given the Verbal Scale of the Wechsler Intelligence Scale for Children, known as the WISC, or the Interim Hayes-Binet Tests of Intelligence.

^{1/}Jacob Rothschild, A Report of Psychological Studies with Deaf-Blind Persons, Volume IV of Rehabilitation of Deaf-Blind Persons. The Industrial Home for the Blind, Brooklyn, 1, New York, 1959, p. 7.

2. The Tests

The problem of finding suitable tests.--The many variables which may characterize the population of deaf-blind children make the problem of finding suitable tests an exacting and difficult one. Tests for the deaf are too visual, tests for the blind are too auditory, and tests for the normal assume the presence of vision and hearing. Performance tests requiring the physical manipulation of concrete materials rather than verbal responses, are used except in cases where amount of vision, hearing, speech, or ability to understand by means of vibration may permit the use of oral or written (large print or Braille) directions and responses. It is possible to administer verbal tests to totally deaf-blind subjects if they are sufficiently advanced in language and are skilled in manual communication or in communication by means of vibration-speech and speech-reading or in reading and writing Braille.

The preponderance of children with usable sight has its effect on the testing situation and allows the use of some visually oriented tests. It is realized that quantitative results obtained by a partially-sighted child on a test standardized on seeing children cannot strictly and validly be compared with the norms, but considering the dearth of appropriate tools, the judicious use of such tests for obtaining qualitative information as well as indications of functioning level seems justified.

The chosen tests.--The tests and scales chosen for experimental use with the deaf-blind are given below together with pertinent remarks concerning each of them. Comment will be made as to appropriateness with Group 1, Group 2 or Group 3, the classification given in the preceding section. Because it is assumed that the reader is familiar with the tests or intends to familiarize himself with them the tests will be discussed here only to the extent necessary for present purposes. It should be understood that the general reasons for the choice of each test are: (1) the test is a well-planned, standardized, accepted test; (2) the test has been used, to some extent at least, with either the deaf or the blind or with individuals from both handicapped groups; (3) the test seems to give promise of usefulness with the deaf-blind.

Social Maturity Scales:

Social maturity scales are included in the list of suggested evaluative tools for use with the deaf-blind because the writer feels that inferences concerning intellectual function may be made from results derived from such scales, especially with the very young deaf-blind to whom it is not possible to administer intelligence tests. The Vineland Social Maturity Scale^{1/} and the adaptation of it for use with blind children, by

^{1/}Edgar A. Doll, The Measurement of Social Competence: A Manual for the Vineland Social Maturity Scale. Educational Test Bureau, Inc., Minneapolis, 1953.

Maxfield and Fjeld^{1/} are particularly usable with these children due to the fact that information is elicited from a person familiar with the child (preferably a parent) and no participation is required of the subject. Both scales evaluate habitual performance or actual functioning level in regard to social competence, a fundamental aspect of the development of all children. Both scales yield a social age and a social quotient, but these, particularly with handicapped children are the least important of the results. Qualitative observations and indications as to level of functioning, as well as areas of weakness and strength are the more valuable factors for present evaluation and future planning. In regard to the differential diagnosis of auditory disorders, the social maturity scale is significant, and results may be indicative of peripheral deafness, aphasia, psychic deafness, and mental retardation.^{2/}

The Vineland Scale is a development scale covering the years of birth to adulthood; the Maxfield-Fjeld Tentative Adaptation is for use with blind children

1/Kathryn E. Maxfield and Eunice L. Kenyon, A Guide to the Use of the Maxfield-Fjeld Tentative Adaptation of the Vineland Social Maturity Scale for use with Visually Handicapped Preschool Children. American Foundation for the Blind, New York, 1953.

2/Myklebust, Auditory Disorders, op. cit., pp. 292-297.

from birth to six years. A more recent scale, an outgrowth of the Maxfield-Fjeld has been developed by Maxfield and Buchholtz.^{1/} However, for use with deaf-blind children, the earlier adaptation of the Vineland seems preferable, mainly because language items are not found on as low an age level as in the more recent scale and therefore, the deaf-blind child is not penalized as soon, so to speak, for his deficit in the area of communication.

Further research is intended in the use of social maturity scales with the doubly handicapped child and perhaps in the devising of a scale primarily for this type of child. In the meantime, many questions exist; for example, is it better to use the Vineland Scale, which has been used to advantage with deaf children, or to use the Maxfield Adaptation which was intentionally arranged for use with blind children? On either scale, how should the items which assume hearing be interpreted? Should the double scoring method be used with an attempt to determine overflow effect of a handicap? Should the two scales be used in conjunction with each other if the child being considered has some sight? Is it advisable to break down the items so that more differentiation is shown

^{1/}Kathryn E. Maxfield and Sandra Buchholz, A Social Maturity Scale for Blind Preschool Children: A Guide to its Use. American Foundation for the Blind, New York, 1957.

for small steps of progress? (For example, the child may lift the spoon to his mouth but cannot or will not manipulate it in order to get food on it.) What about introducing items dealing with touch and vibration so important to this type of child?

Pending more conclusive research the experienced examiner will have to answer these questions himself and proceed in a manner best suited to the individual child.

The social maturity scale in either of the above forms constitutes a revealing part of the evaluation program and may be used with Groups 1, 2 or 3.

Newland's remarks on the social maturity scale seem apropos:^{1/}

"The scale is a highly useful device with which to quantify social competence, but its author and wary users of it are well aware that it reflects also 'limitations imposed by intelligence level, emotional attitudes, social conditioning, disposition, and the like,' and fully recognize that scores earned on it must 'be interpreted with due regard for special limiting circumstances' which include physical handicapping conditions."

The Cattell Test for Infants and Young Children:

This test, developed as a downward extension of the Revised Stanford-Binet Intelligence Tests, is useful with Groups 1, 2, and 3, although wisdom must be used in the selection of appropriate items for each group. At the youngest level, the items are concerned with

^{1/}Newland, op. cit., p. 99.

motor development, social responses, speech evolvment, and with auditory or visual perception. Results of the latter may be significant in the appraisal of amounts of vision and hearing in the very young child. Norris suggests the feasible plan of altering items concerned with the visual prehension of objects in such a way that the child may be made aware of the presence of the objects through the tactile sense.^{1/}

Items dealing with levels of genetic development are of value observationally, particularly in the case of the child who has not developed the manipulatory ability with which most of the remaining items are concerned and which are the beginnings of such psychological tests as the Three-hold Formboard and block building items. We agree with Watson that the "application of the Cattell Scale gives an opportunity for quantification of impressions"^{2/} for which the examiner is often grateful. However, the quantitative score must be viewed in the light of the child's opportunity for experience, and the qualitative interpretation must be considered of much greater significance.

1/Miriam Norris, Patricia J. Spaulding, and Fern H. Brodie, Blindness in Children, University of Chicago Press, Chicago, Illinois, 1957, p. 18.

2/Robert I. Watson, The Clinical Method of Psychology, Harper and Brothers, New York, 1951, p. 339.

The following quotation gives further reasons for using this test with the deaf-blind:^{1/}

"A distinct advantage of these tests is that there is no time limit and no definite order of presentation. These factors add to the flexibility of administration which is required for many children. Another advantage of these tests is the inclusion of developmental aspects of auditory behavior."

The preceding evaluative tools, it will be observed, are useful to some extent with all three groups of deaf-blind children. (See classification in preceding section.)

The following tests and scales, or the sub-tests therein, may be used in the assessment of deaf-blind children to whom it is possible to administer psychological tests, that is, to Group 1 or Group 2 or to both of these groups, but not to Group 3.

The New Revised Stanford-Binet Tests of Intelligence:

The items selected from these tests for experimental use here are all non-verbal ones. Some may be used with Groups 1 and 2 and others with only Group 2.

The Interim Hayes-Binet Tests of Intelligence:

This scale, the most widely used intelligence scale for the blind, can be used with the deaf-blind child in Group 1 only if he has sufficient understanding of language and adequate avenues of communication by means of hearing and speech or by means of manual procedures or writing techniques (large print or

^{1/}Myklebust, Auditory Disorders, op. cit., p. 299.

Braille). It is seldom that it can be used with a deaf-blind child, but when it can be administered, it is of real value.

The Wechsler Intelligence Scale for Children:

The whole scale consists of a performance scale and a verbal scale, but the Performance Scale is the one used mainly for the purpose under discussion. The items require so much vision however, that it may be used only with Group 2, and then only if the subject has fairly good visual acuity. It is realized that results cannot be compared normatively, but qualitative aspects of the results obtained on the sub-tests are revealing.

Occasionally, the Verbal Scale may be administered under the unusual circumstance of the presence of high language ability of the subject combined with a means of communication with the examiner--oral, manual, or written. At times it may be possible to obtain a Verbal I. Q., or even a Full Scale I. Q. with these children termed "deaf-blind." If so, the numerical score is considered in relation to the child's total situation.

Scholl has used this test with blind and partially sighted children. She found that no special adaptations were necessary in administering the verbal series and that the performance tests could be administered if the subject had enough vision for the

tasks. "It is interesting to try them out and much can be observed about the student during the administration of these sub-tests. The only variation would seem to be permitting the child to hold the booklet in his hands for Picture Completion and using a large pencil for Mazes and Coding."^{1/}

Larr and Cain conclude "that the Wechsler Intelligence Scale for Children is a useful tool for the assessment of non-verbal abilities of deaf children. One evidence of its validity is afforded by a good correlation between this test and the Ontario School Ability Examination, which has been standardized in schools for the deaf. A mean score of 97.8 on tests of 248 deaf students presents some indication of its reliability. In addition to these results, the ease with which the WISC is administered and scored gives further support for its use in measuring the learning abilities of deaf children."^{2/}

The Arthur Point Scale of Performance Tests:

Some selected items from this test, standardized on children from five to sixteen years of age, may be used with Groups 1 and 2 and a few others may be used with Group 2 only. The formboard sub-tests are of

^{1/}Geraldine Scholl, "Intelligence Tests for Visually Handicapped Children," Exceptional Children (December, 1953), 20:116-123.

^{2/}Alfred L. Larr and Earl R. Cain, "Measurement of Learning Abilities," in The Volta Review (April, 1959), 61:160-162.

particular value with the children without any vision. The tests requiring vision, administered to Group 2, give indication as to level of mental functioning as well as such qualitative aspects as approach to task, motor coordination, manipulative ability, and persistence.

The Ontario School Ability Examination:

This test, which has been standardized on deaf children from age two years to adulthood, is proving to be of value quantitatively to some degree and qualitatively to a greater degree. Selected items, for the most part, are used with Groups 1 and 2 but with Group 2, it is occasionally possible to use the complete test. This test can be rich in its yield of qualitative information when administered by an experienced examiner.

Extraction of Usable Items.--We have learned that it is very seldom that a test can be used in its entirety with a deaf-blind child. Suitable items, therefore, have been selected from the preceding tests and have been arranged according to their appropriateness with children who have usable vision or with others who are blind. These arrangements, together with others found convenient for use by the examiner, may be found in Appendix B.

3. Procedures and Problems of Administration and Interpretation

As the tests were used, observations were made concerning methods of administering the tests to the children in the classification groups and concerning the interpretation of the results obtained. These observations are summarized in an excerpt, of which the present writer is the author, from a manual being prepared by the writer and other staff members at Perkins School for the Blind on the subject of the evaluation of the educability of deaf-blind children.

Although the discussion of procedures with Group 3 does not involve the use of tests of mental capacity, the writer feels that it should be included here because many deaf-blind children are of the type classified in this group.

The relevant extract from the forthcoming manual is as follows:

"General Procedures with Special Emphasis on Group 3

"There are general evaluation procedures appropriate with all deaf-blind children, whether or not psychological tests may be administered to them. These techniques are particularly vital in the case of children classified in Group 3, those children too young for or incapable of responding in a structured situation and with whom the evaluation approach must be extremely subjective and entirely based upon the examiner's experience and upon his ability to infer mental capacity and potential from many factors other than the results of psychological tests.

"The case history must be carefully reported and analyzed with consideration of all possible information concerning prenatal and birth history, illnesses, and genetic development. Reports of specialists, such as neurologist, pediatrician, otolaryngologist, ophthalmologist and audiologist must all be studied and taken into

account. As mentioned earlier in this manual a differential diagnosis as to the type of auditory disorder is of utmost value in the attempt to determine whether apparent hearing, speech and language difficulties as well as general behavior may be due to peripheral deafness, aphasia, psychic deafness or mental retardation. In this latter area, the use of psychological tests is most helpful, but even without them, the skilled examiner can form some opinion according to results of the social maturity scale, tests of auditory behavior, examinations of motor capacity, evaluations of emotional adjustment, and general observation of behavior.

"Concerning general observation of behavior, almost innumerable aspects must be noted. To name a few: visual behavior; auditory behavior; type of response to visual, auditory, tactual, olfactory, gustatory stimuli; language behavior; general responsiveness — for example, responsiveness to people, to toys, to new situations; type of exploratory activity, if any; extent of curiosity as to environment; type of behavior — bizarre, integrated, disinhibited, hyperactive, stereotyped. All such observations are meaningful.

"Another area into which the examiner must inquire and concerning which he must weigh the evidence is that of background and opportunity for learning which the child has had up to the time of the evaluation period. Deprivation in love and affection, in experiences, in contact with people and things in the environment, all combine with the effects of sensory deprivation to keep the child from developing to his maximum potential. The wise observer takes all this into account in his final evaluation. The deaf-blind child who has not had opportunity for normal experiences in addition to his lack of visual and auditory experiences is bound to function at a level much lower than his chronological peers. However, the compilation and consideration of all the aforesaid information enables the examiner to form an opinion as to whether the child is irretrievably low in performance and ability or whether right experiences, proper training, and constructive educational procedures may bring about an approximation of normal functioning.

"Procedures for Group 1 and Group 2

"More specific suggestions may be made concerning evaluation procedure with Groups 1 and 2, the blind and partially seeing children to whom it is possible to administer some psychological tests. (See Appendix B for a list of tests arranged according to type and according to the group with which they may be used.) It is seldom

that a complete test or scale may be used, although occasionally, due to the ability of the subject and the degree of the handicaps, it may be possible to use a test in its entirety. As a rule, however, only selected items can be administered and the selection necessarily is in accordance with the variables involved. The examiner must be adaptive as well as willing to vary his test battery content according to the ability of the individual child. Whenever possible, standardized techniques for test administration should be followed, but adaptations in methodology such as directions, timing, and materials are sometimes necessary. Then the tests are administered according to the child's level of cooperation and the results are used qualitatively.^{1/}

"Directions

"Adaptations in directions usually involve a change from verbalization to pantomime, a process which often calls forth the ingenuity of the examiner. For example: 1) in order to help the deaf-blind child understand that he is to work as quickly as possible, the examiner may convey the idea by his own speedy gestures; 2) if the child has enough sight for a test such as the Picture Completion item of the WISC, preliminary drawings or pictures with missing parts may aid him in grasping the problem involved.

"Timing

"In timed tests, observations of time limits and interpretation of timed scores should be at the discretion of the examiner and in accordance with the characteristics presented by the subject. It often seems wise to make three recordings of time: the limit set forth in the manual of directions of the standardized test being used; time and a half; and the time elapsing before the child is either successful with the task or ceases to perform. The attempt should be made, in words or pantomime, to suggest the idea of speed, but qualitative observations such as approach to the problem, manipulative ability, and persistence are usually of more importance than quantitative scores.

"A few instances of test items in which strict time scoring procedures may be waived or should at least be very carefully considered in the total evaluation are as follows: 1) formboards, such as the Seguin Formboard, when they are used entirely

tactually and without the aid of the vision for which they were originally intended; 2) items requiring the copying of bead patterns when the study of the pattern must be made tactually by the blind child; 3) block building when investigation of the model to be reproduced must be done tactually with the concomitant possibility of upsetting the model and the reproduction if the touch is not sufficiently gentle; 4) items involving the reproduction of block designs whether they be visually observed as are Koh's blocks or tactually explored as are blocks adapted by rough and smooth surfaces for use with the blind. If the child has poor vision, or if he must examine the blocks tactually, his performance speed will be affected.

"Materials

"Adaptations involving change in materials are few at the present time, but there are beginnings of research in this area. For tests suggested in this manual, the rough and smooth blocks, as a substitution for the vari-colored blocks, constitute the only adapted materials. Sandpaper or pin-point surface may be used to cover one of the two colors on the blocks. Also, block size may be double the size of those included in the WISC material.

"Quantitative and Qualitative Results.--Quantitative scores such as mental age levels of performance or intelligence quotients are used only as indications of ability and not as conclusive and final evidence. Neither normative comparisons nor comparisons within the deaf-blind group may validly be made except in a very general way and with due consideration for the variables intrinsic to each child. The deaf-blind child is not expected to perform at a level commensurate with his chronological age but the degree to which he approximates this, together with all other information concerning him, gives revealing information as to his mental ability and the extent to which he is affected by his handicaps. As an approximate indication of learning capacity, as a point of reference, and as one more piece of information concerning the deaf-blind child about whom it is difficult to learn very much, quantitative test results are of value.

"Qualitatively, on the other hand, the child's use of the test materials and his response to the test situation, afford significant information above and beyond any quantitative results which may be obtained. 'What the child does is revealing, but frequently what he does not do, and the manner in which he does not do it, are

also revealing clinically.^{1/} Differentiation should be made between quantitative test results, which may be affected by such factors as physical handicap, motor involvement, experiential deprivation, and psychic overlay, and the child's true learning potential. In this, perhaps the most valuable tool will be the examiner's ability to deduce innate capacity on the basis of comparison with other children he has known whether they be normal, mentally retarded, blind, deaf, or deaf-blind. When this opinion born of experience and qualitative observation is substantiated by test results, faith in the use of psychological procedures with the deaf-blind is strengthened."^{2/}

4. Rationale and Qualitative Aspects of the Various Tests

In a preceding section of this chapter, general reasons were given for the choice of the tests under discussion. Here we shall offer 1) suggestions as to what the test situation as a whole may reveal in regard to qualitative information about the deaf-blind child and 2) remarks on the clinical usefulness and qualitative aspects with deaf-blind children of the various types of tests which are found within the major tests.

The material is the result of thought concerning the rationale of the tests and the qualitative aspects of their use with deaf-blind children. It is granted that a quantitative score may be obtained, but it is felt that this result of the testing procedure is, in most cases, to be minimized and is to be taken only as an indication of functioning level, an indication which is often helpful but which is still only a part of

^{1/}Myklebust, Auditory Disorders, op. cit., p. 298.

^{2/}Gertrude M. Stenquist, in a manual now being prepared at Perkins School for the Blind on the subject of the evaluation of deaf-blind children as to educability.

what we learn about the child we are assessing. To borrow Newland's words, we distinguish between "manifest capacity" and "basic capacity."^{1/}

Newland has this to say about these two capacities:

"We shall use the term 'manifest capacity' to denote that performance level which is immediately and most easily apparent in the test situation, the interpretation of which is unaffected by any qualitative explanations. It is the test indication of what the client did, how he scored according to standardized procedure of test administration. It involves no guessing by the examiner as to how much better or worse the client 'really' is. It is the unmitigated performance at the time of testing. It is reasonably safe to assume that by far the major percentage of published reports of the 'intelligence' of various types of exceptional children are reports of this manifest capacity. To the extent that readers of such reports assume that these manifest capacities are synonymous with the basic capacities of these children, to that extent may harm be done these children by means of distorted educational and social planning for them.

"Since it is the manifest capacity which is indicated by the gross performance on the test, it should be noted that the basic capacity is inferred by the clinician. To the uninitiated, this inferring process may seem quite nebulous and the result of such inferring only a wild guess. To the person who has worked clinically, rather than mechanically psychometrically, with children, this process is psychologically sound and real, and the results of it are supportable estimates. In some instances, basic capacity is taken to be indicated more by certain parts of certain tests (vocabulary versus memory span, for instance); in other instances, the clinician's inference as to basic capacity stems from the quality of performance rather than from the quantity of performance in the examining situation. This is admittedly a subjective process, but the subjectivity occurs within a trained clinician's frame of reference rather than within the frame of reference of a psychologically untrained person. The chances for and magnitude of error in such 'measurement' of this basic capacity are clearly greater in such estimations by properly trained persons than is the case in the standardized use of psychological devices in ascertaining evidence of manifest capacity, but the

^{1/}Newland, op. cit., p. 82.

clinician believes that a more meaningful psychological indication of the child's real potential is thereby obtained."^{1/}

Qualitative Information Found in the Test Situation
in General

Visual and auditory behavior

Language behavior (jargon, vocalizes for pleasure, gestures meaningfully, cries, laughs, smiles, uses speech)

Means of communication (gestures, signs, manual alphabet, large print, Braille, vocalizes, uses speech)

Motor behavior (balance, gait, grasp, tremors)

Emotional behavior and personality traits (withdrawn, fearful, shy, anxious, distractable, hyperactive, aimless, perseverative, bizarre, easily frustrated, cooperative, alert, eager to please, responsive to praise, interested)

General responsiveness to people (relates, rejects, fears, ignores)

General responsiveness to objects and toys (uses realistically, uses meaninglessly, rejects)

Quality of curiosity concerning environment

Manner of exploring environment (visual, auditory, gustatory, tactual, olfactory)

Response to verbal or non-verbal directions

^{1/}Newland, *op. cit.* p. 82.

Comprehension of test problems (quick, slow,
uncomprehending)

Approach to task (tactual or visual or integrated use
of both, aimless or purposeful, systematic or
haphazard, interested or disinterested, use of
trial and error, self-corrective, characterized
by compensatory use of tasting and smelling)

Quality of attention (sustained, intermittent,
non-existent)

Quality of visual-motor or tactual-motor coordination

Handedness

Manipulative ability (awkward, fumbling, capable,
influenced by motor involvement)

Adaptability and learning capacity (approach to new
tasks and improvement with trials)

Clinical Usefulness, Qualitative Aspects, and Procedures
of the Various Types of Tests

(The suggestions as to the qualitative aspects of the
test situation as a whole are applicable to the tests
listed below. Further reference to them, therefore,
will be omitted except in instances where they are of
extreme relevancy.)

Formboards.--Although the major intended use of formboard
tests with normal children may be the measurement of psychomotor
reaction to simple tasks, with the deaf-blind they are not used
primarily as speed tests. Observation of time limits and in-
terpretation of time scores should be at the discretion of the

experienced examiner and in accordance with the characteristics presented by the subject. Qualitative observations may be: grasp of the idea of hurrying; speed of psychomotor reactions; indications as to learning ability from one trial to another; quality of tactual or visual memory; quality of discrimination of form. With the very young deaf-blind child, the Three-hole Formboard, as used in the Cattell Scale and then in the Binet Scale, is most useful qualitatively and developmentally over a period of time.

Block building.--Block building may be a difficult process for a deaf-blind child, particularly when he is required to copy a model. The necessity for tactual investigation of the model often causes unintentional knocking down of the blocks. Patience on the part of the examiner, however, can still make block-building tests produce valuable qualitative results. In items in which there is limited exposure of a model or a time limit for reproduction of the model, the examiner must adjust timing procedures. Level of functioning may then be difficult to surmise, but, once again, subjective notations will be useful. We look for purposive, imitative response, quality of tactual and visual exploration of models, tactual or visual memory for reproduction, ability to reproduce, motor coordination needed for placing the blocks, and ability to analyze where each block belongs.

Bead stringing.--Terman and Merrill's statement concerning the bead stringing items at the three year level in the Binet tests is as follows: "Bead stringing involves complex motor

coordination. Its interest value is high, as it fits into the child's every day experience and utilizes familiar materials and the play attitude. Our data show the test to be one of the easiest at this age level."^{1/} It is true that the young deaf-blind child may not have experienced bead stringing before the examiner meets him. Nevertheless, this item does seem to be a good one for young deaf-blind children as well as for the young normal child.

The qualitative factors of manipulative ability, motor coordination, tactual or visual perception and memory, and understanding of the task are all of interest. In items in which a bead pattern is to be copied from memory, the time of observation of the model should be lengthened for the child who must explore tactually and for the child who must combine tactition and vision.

Pegboards.--Stutsman says of the Wallin Pegboards, A and B, "Because of the popularity of these two tests, the ease of giving and scoring, the number of clues of personality they reveal, and their diagnostic value, they are two of the best tests for children of the younger age groups."^{2/} These tests are proving useful with young deaf-blind children, especially with those who are at a very low level developmentally. The representation of the pegboards at intervals assist in the acquiring of information

^{1/}Lewis M. Terman and Maud A. Merrill, Measuring Intelligence, Houghton Mifflin Company, Cambridge, Massachusetts, 1937, p. 200.

^{2/}Rachel Stutsman, Mental Measurement of Preschool Children, World Book Company, New York, 1931, p. 208.

about the little children with whom the use of very few tests is possible. Such factors as increased interest, less resistance, improvement in grasp, and more purposeful exploration of holes and placement of pegs all add to our knowledge of the child so difficult to know. More advanced pegboard tests are useful with the more capable children.

Paper folding.--This type of test, a variation of copying tests and one which involves imitation of remembered movements, is of more use with children who can see than with children who cannot. Nevertheless, it is being found useful with deaf-blind children and gives some clues as to mental function even though mental levels cannot be definitely affixed. The tactual following by the blind child of the folding process as carried out by the examiner can be a slow and rather painstaking process. However, approach to the task and results of effort can be indicative of the child's ability. With the children who have usable vision, the tests may be used in a more standardized way. Manipulative ability and visual or tactual memory and coordination are only some of the qualitative aspects.

Block designs.--Koh-type blocks for the purpose of the reproduction of designs may be used with blind subjects if the blocks are adapted in such a way that rough and smooth surfaces replace the colors of the blocks. The writer has had the privilege of using the rough and smooth blocks and pattern designs from the Performance Scale for Adult Blind which is not yet ready for publication and which is still in developmental stages at the Illinois Institute of Technology in Chicago.

These adapted blocks and patterns have proved to be very useful and provide information about deaf-blind children which is similar to that provided by the use of colored blocks with subjects who have usable vision. (Claassen^{1/} and Wattron^{2/} have written of their exploratory use of rough and smooth blocks with blind children.)

Primarily, block design tests give a good indication of ability in analysis and synthesis and it seems possible to reach these abilities through the tactile sense with the rough and smooth blocks as well as through the visual sense with the colored blocks. The deaf-blind child's approach to the reproduction of the design is indicative of his ability to analyze tactually the design into its component parts and then to synthesize these impressions in reproducing the whole design. His thinking processes are somewhat revealed and we observe his ability to make the necessary generalizations from the design to the blocks. Trial and error behavior is noted as well as memory for design, indicated by amount of checking and rechecking of the original. Also, frustration level and persistence are qualitative aspects.

With the children with usable vision, the rough and smooth blocks have also proved useful because the roughness and smoothness are in contrasting black and white. Also, the regular

1/Robert Claassen, "Tests for the Blind," The International Journal for the Education of the Blind (October, 1954), 4:12-15.

2/John B. Wattron, "A Suggested Performance Test of Intelligence," The New Outlook for the Blind (April, 1956), 50:115-121.

colored blocks from the WISC or the Ontario are usable if the child's sight is equal to the task. Of course, mental levels must be interpreted with due regard to the amount of vision and other factors in the child's total situation. Scholl writes in her discussion of her use of the WISC with visually handicapped deaf-children, "Block designs presented no special problems. The instructions in the manual were followed with no difficulty."^{1/}

Knot tying.--These tests may be given to children without vision as well as to children with useful vision. In each case, such observations as interest in performing the task, manipulative ability, motor involvement, imitative capacity and persistence are worthy of note.

Pencil tests.--The pencil tests can, of course, be given only to the children in Group 2, those with usable vision. Here, they are often valuable in indicating to the examiner the amount of vision present, and retests over periods of time may be helpful in determining improvement or deterioration in visual capacity. Factors of importance are visual-motor coordination, visual perception, visual memory in the case of memory for designs tests, ability to observe details, handedness, and grasp. Quantitative results with these deaf-blind children with useful vision must be very carefully interpreted with due consideration of visual impairment. Large black pencils should be used by the child and he should be allowed to get as close to the materials as seems necessary. The Coding test in the WISC requires a degree of

^{1/}Geraldine Scholl, "Intelligence Tests for Visually Handicapped Children," Journal for Exceptional Children (December, 1953), 20:119.

vision seldom found in these children and their performance is apt to be quite slow due to their visual-motor difficulties. We agree with Scholl's statement: "It would seem that since the time allowed for sight-saving students to complete the Stanford Achievement Test is one and a half times that for normal sighted students, some allowance should be made on a timed test that involves speed of eye movement to the extent that Coding does."^{1/}

Other visual tests.--The examiner should remember that items such as Picture Arrangement and Object Assembly in the WISC require the noticing of minute details, details which may be missed due to visual difficulty rather than conceptual lack or poor organizational ability. The whole problem of administering visually oriented tests to visually handicapped children presents numerous problems and there are many instances when allowances must be made and strict acceptance of test results must be avoided. Nevertheless, the use of visual tests with some partially seeing deaf children seems of value as long as we consider results only as indications and not as conclusive evidence of mental ability.

The Knox Cube Test (Grace Arthur) and the Tapping Test (Ontario).--These tests have been attempted by the writer with deaf children who are totally blind, letting one of the subject's hands rest on that of the examiner as the tapping was done, but attempts were not successful. With partially sighted children the results were not much better for as the series of tappings

^{1/}Scholl, op. cit., p. 120.

become increasingly difficult, poor vision seems to add to the general confusion and to increase the difficulty in following and remembering the sequences. With those children with the largest degree of useful vision, however, fairly reliable results may sometimes be obtained. These tests involve attention, concentration, memory span, and ability to reproduce the tapping sequences.

Dominoes.--This test from the Ontario School Ability Examination is one of the least useful with the children whom we are considering for it is too dependent on vision for valid results even with partially sighted children, and it cannot be used with blind children at all. With most of the children with partial sight with whom it was attempted by the writer, poor vision was such a handicap that timing procedures could not be adhered to and it was obvious that it was not a fair test. With those with whom it could be used, however, qualitative observations were useful.

Healy Fernald Puzzle.--The use of this test with deaf-blind children would seem to indicate that it may not be appropriate for children without sight except for qualitative observations. (Further research is intended with blind children.) It has been successfully used with the children in Group 2, however, and yields revealing information. Some of the qualitative factors are trial and error approach, degree of persistence, frustration level, ability to hurry, learning capacity.

Weight arrangement.--This item from the Ontario is an interesting one when used with the deaf-blind and is useful with

totally blind children. With the child without any sight, the problem of conveying the idea of the test is rather difficult and must be done with the child's hands on those of the examiner. This is a slow process but is possible to accomplish. Here, the ability of the child, whether blind or with partial vision, to grasp the problem of the test is one of the main qualitative observations. With deaf-blind children tested by the writer, this ability to understand the type of response required has varied to a surprising degree. Other observations of special interest here are handedness and approach to problem, that is, methodical or haphazard, interested or disinterested, purposeful or aimless.

CHAPTER V

DISCUSSION, CONCLUSIONS AND SUGGESTIONS

FOR FURTHER RESEARCH

The attempt of this thesis.--As stated in the opening chapter, this thesis has been an attempt to meet, in at least a small way, some of the needs which are evident in regard to the intellectual evaluation of deaf-blind children. Three of these needs were named and are repeated here: 1) the need to assess available instruments in order to determine their applicability in diagnosing deaf-blind children; 2) the need to assess the available procedures from the viewpoint of amalgamating those items from the various tests which have highest validity as determined by practical utilization with deaf-blind children; 3) the need to consider the existing possibilities concerning the development of newer or different techniques.

The first need.--Concerning the first need, it is the writer's hope that her discussion of certain standardized tests has led to the conclusion that the chosen tests and items from those tests do have merit as to applicability and adaptability. It is the writer's belief, after the extensive exploratory use of the tests with the Perkins group and the less extensive but still fruitful use of them with the New York and Kansas groups, that these tests do have definite value in the assessment of the mental ability of children with a double sensory handicap.

The word "assessment" is used advisedly because with these exceptional children, this broad term with its qualitative connotation may be more fitting than "testing," for we have found that the quantitative score is very often of less value than the qualitative observation. We have found that it is possible to administer many of the items, and in a few cases, all of the items from these tests, when they are carefully chosen according to the degree of the handicap of the child. We have learned, too, that standardized procedures may be used in many cases, but that the examiner must be willing to adapt procedures and materials if necessary and not be too concerned about this as long as it results in a more accurate idea of the real ability of the child.

Thus far, we have not ventured much beyond the confines of these standardized tests since the best basis for work in this area seems to be the careful examination of the use of these accepted techniques. The best way to determine the applicability of these tools with deaf-blind children appears to be to use them as often as possible with as many children as possible and over a long period of time. Then their value as diagnostic and prognostic instruments may be ascertained.

The second need.--An attempt has been made in this paper to begin to meet the second need stated above, that of amalgamating those items from the various tests which have highest validity as determined by practical utilization with deaf-blind children. Those items most useful with the totally blind and

those most useful with the partially seeing have been arranged according to type of test and chronological level. Much more extensive use of the items must be made before we can be definitive concerning their validity with the deaf-blind, but effort has been initiated.

The third need.--Toward the need to consider the existing possibilities concerning the development of newer and different techniques, this paper has contributed very little. Actually, work done by the writer thus far in regard to the evaluation of the mental capacity of these children has consisted for the most part in doing what might be termed "the obvious," that is, taking accepted, standardized procedures and attempting to use them with as little adaptation as possible with the children with whom she has had contact. This has seemed to be the logical and wise primary step. There are possibilities concerning the development of different techniques, but as yet they are only in thought and are not in the process of being actualized. There are many avenues for further research, some of them along lines fairly familiar and others which venture into relatively unknown areas.

Suggestions for further research.--Primarily, there is a need for continued work with the tests already being used with the hope that patterns of mental capacity may be seen in relation to etiology of handicap, age of onset of handicap, and the many variables which characterize this population. These same variables preclude the expectation of the establishment of norms

for this group, but continued use of the tests may reveal facts which will be helpful in the future evaluation of and planning for these children. Especially, the tests and their use with the deaf-blind should be studied over a sufficient length of time so that their value as prognostic instruments concerning educability may be determined. It is most desirable to know the degree of accuracy with which the tests provide an estimate of mental ability.

At present there seems to be a dearth of tests which are appropriate for the totally deaf-blind child. It is true that we have found that the percentage of children within the "deaf-blind" population who are without any residual vision or hearing is relatively small, but nevertheless, these children are the ones most difficult to evaluate as to mental capacity. Therefore, the need in this area is especially pressing. New tests or adapted tests should, of course, be tactually oriented for these children and might be concerned with the tactual observation of missing parts of objects, with the assembling of parts of objects, with tactual discrimination of form, with raised mazes and geometrical designs, with dominoes with tangible dots on them. These are only a few of the possibilities for investigation and research in this area.

Research is also needed in regard to social maturity and the deaf-blind. This phase of development can be extremely significant, especially in relation to the very young deaf-blind child to whom it is not possible to administer psychological

tests. The administration of a social maturity scale, especially with the child's mother as informant, can be revealing as to the child who is a baffling enigma. The difficulties of administration are numerous, however, and problems must be solved as to the use of the Vineland Social Maturity Scale or of the Maxfield-Fjeld Tentative Adaptation of the Vineland Social Maturity Scale for Use with Visually Handicapped Pre-school Children. In using either scale, interpretation of items is a difficult procedure with deaf-blind children. Perhaps the eventual solution will be a scale adapted for the deaf-blind or constructed entirely for use with them and based on the significant stages of the development of the social competence of deaf-blind children.

Further ideas for research in regard to the evaluation of this doubly handicapped group are literally too numerous to mention at this time.

Conclusion.--The problems involved in the evaluation of the mental function of deaf-blind children are manifold, and the solving of them is just beginning to be attempted. The writer hopes that the exploratory procedures outlined here may prove to be a contribution of value to this endeavor. Perhaps these tests and techniques may serve not only as a basis for the clinical observation of the deaf-blind child and for social and educational recommendations for the maximum development of his capacity, but also as a starting point for further research and accomplishment in regard to the problems involved in his evaluation.

APPENDICES

APPENDIX A

SELECTED NAMES OF PSYCHOLOGISTS OR WRITERS FOUND IN THE
LITERATURE WHO HAVE USED CERTAIN STANDARDIZED TESTS
WITH THE DEAF AND WITH THE BLIND
OR HAVE WRITTEN OF SUCH USE*

The Vineland Social Maturity Scale

With the deaf:

Bradway
Burchard and Myklebust
McWilliams
Myklebust
Ross
Streng and Kirk

With the blind:

Bradway
Maxfield and Fjeld
Maxfield and Buchholz
Wilson and Halverson

The Maxfield-Fjeld Tentative Adaptation of the Vineland
Social Maturity Scale for Use with Visually Handicapped Preschool
Children

Maxfield and Fjeld

* Titles of the references in the literature in this regard
may be found in the bibliography.

Hayes

Norris and Spaulding and Brodie

The Revised Stanford-Binet Tests of Intelligence

With the deaf:

Pintner

Pintner and Eisenson and Stanton

With the blind:

Hayes

Interim Hayes-Binet Test of Intelligence

With the blind:

Hayes

Norris

Simmons

Waterhouse (in writing about Samuel R. Hayes)

The Cattell Tests for Infants and Young Children

With the deaf:

Myklebust

McWilliams

With the blind:

Norris

Wilson and Halverson

The Wechsler Intelligence Scale for Children*

With the deaf:

Graham and Shapiro

* The Wechsler-Bellevue Intelligence Scales, Form I and Form II have been used with the deaf and with the blind and have been written up in the literature. With the deaf: Groetzinger and Levine. With the blind: Hayes and Lowenfeld and Simmons.

Larr and Cain

Murphy, K. P.

Murphy, L. J.

With the blind:

Scholl

The Grace Arthur Point Scale of Performance Tests

With the deaf:

Bishop

Burchard and Myklebust

Capwell

Larr and Cain

Streng and Kirk

The Ontario School Ability Examination

With the deaf:

Amoss

Kirk and Perry

Morrison

Newland

Ross

Material in Appendix B will be used in whole or in part in the manual concerning the evaluation of deaf-blind children as to educability which is now being prepared at Perkins School for the Blind.

APPENDIX B

THE ARRANGEMENTS OF THE SUB-TESTS ACCORDING TO TYPE,
 ACCORDING TO APPROPRIATENESS FOR USE WITH CHILDREN
 WHO ARE BLIND OR WITH CHILDREN WHO HAVE USABLE
 VISION, AND ACCORDING TO CHRONOLOGICAL AGE LEVELS

Test Items Arranged According to Type and According
 to Group With Which They Are Useful.

<u>Type of Test</u>	<u>Group</u>	
	<u>1*</u>	<u>2**</u>
Formboards	X	X
Block Building	X	X
Bead Stringing	X	X
Peg Boards	X	X
Paper Folding	X	X
Block Designs -- rough and smooth	X	
Koh's Block Type		X
Knot Tying	X	X
Pencil Tests		X
Visual Tests such as visual discrimination of form, picture completion, picture arrangement, object assembly, coding, manikin, feature profile		X
Knox Cubes		X
Others: Healy Fernald Puzzle***	X	X
Weight Arrangement	X	X
Dominoes		X
Tapping		X

* Group 1: Those children who are blind, deaf or hard of hearing, and to whom some psychological tests may be administered.

** Group 2: Those children who have some usable vision, are deaf or hard of hearing, and to whom some psychological tests may be administered.

*** The appropriateness for blind subjects is still undetermined.

Formboard Tests

<u>Test</u>	<u>Age Level</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Cattell	16 months	Places round block in formboard in Three-hole Formboard.	X	X
Cattell	18 months	Places round block in rotated formboard.	X	X
Cattell	20 months	Places square in formboard.	X	X
Binet	2 years	Three-hole Formboard	X	X
Binet	2-6 years	Three-hole Formboard Rotated	X	X
Arthur	5-15 years	Sequin Formboard	X	X
Arthur	6-16 years	Five-Figure Formboard	X	X
Arthur	5-16 years	Casuist Formboard	X	X

Block Building

<u>Test</u>	<u>Age Level</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Cattell	16 months	2 Block Tower	X	X
Cattell	20 months	3 Block Tower	X	X
Ontario	2 years	3 Block Tower		
Binet	2 years	4 Block Tower	X	X
Cattell	2-6 years	Differentiates Between Bridge and Tower.	X	X
Binet	3 years	3 Block Bridge		
Ontario	3 years	3 Block Chair	X	X
Ontario	5 years	5 Block Gate	X	X
Ontario	7 years	Flight of 4 Steps (10 blocks)	X	X
Ontario	8 years	4 Block Cross	X	X

Bead Stringing

<u>Test</u>	<u>Age Level (years)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Binet	3	Stringing Beads	X	X
Binet	6	Copying Bead Chain - Memory	X	X
Binet	13	Copying Bead " "	X	X

Block Designs*

<u>Test</u>	<u>Age Level (years)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Ontario	3	Matching Color of One Block		X
Ontario	5	Building a Red or a White Pattern of 4 Blocks		X
Ontario	6-16	Patterns Numbers 1 through 10		X
WISC	5-15	Patterns A, B, C Patterns I through VII		X

Other Items

<u>Test</u>	<u>Age Level (years)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Binet	5	Tying Single Knot	X	X
Ontario	6	Tying Double Knot	X	X
Ontario	7	Tying Bow Knot	X	X
Ontario	9, 10, 11	Weight Arrangement	X	X
Ontario	10, 12, 14	Healy Fernald Puzzle	X	X

* Experimentation is now going on concerning the use of rough and smooth blocks with blind children and the deaf-blind.

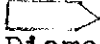
Pegboards

<u>Test</u>	<u>Age Level (months)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Cattell	7	Pulls out peg (Wallin Pegboard A)	X	X
Cattell	10	Pokes fingers in holes of Pegboard A	X	X
Cattell	14	Pulls out and replaces peg in board A	X	X
Cattell	16	Completes Pegboard A when urged	X	X
Cattell	18	Completes Pegboard A without urging	X	X
Cattell	20	Completes Pegboard B without urging	X	X

Paper Folding

<u>Test</u>	<u>Age Level (years)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Ontario	2	Fold diametrically	X	X
Ontario	3	(Square) Fold twice	X	X
Ontario	4	(Small Triangle) Fold twice and then diagonally	X	X
Binet	5	(Small Triangle) Fold along diagonal making triangle; fold through middle for smaller triangle	X	X

Pencil Tests

<u>Test</u>	<u>Age Level (Months)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Cattell	12	Marks with pencil		X
Cattell	14	Makes definite scribble		X
Cattell	16	Scribbles in imitation		X
Cattell	18	Scribbles spontaneously		X
Cattell	27	Imitates vertical line		X
Cattell	30	Differentiates between circle and line		X
	(years)	<u>Imitative Drawings</u>		X
Binet	3	Circle		
	3-6	Cross		
	5	Square		
	7	Diamond		
Ontario	2	Vertical line		
	2	Horizontal line		
	3	Circle		
	4	Square		
	5	Triangle		
	6			
	7	Diamond		
	8	Star		
		<u>Memory for Designs</u>		
Binet	9	Memory for design I		X
	11	Memory for design II		X
Ontario	9,13	Design Pair		X
	16,17,18	Ring Design		X
		<u>Picture Completion</u>		
Binet	4,5	Picture Completion		X

Various Visual Tests

<u>Test</u>	<u>Age Level (years)</u>	<u>Item</u>	<u>Group</u>	
			<u>1</u>	<u>2</u>
Binet	4	Visual Discrimination of Form		X
Ontario	3 4	Discrimination of Forms (Same as Binet)		X
	5	Forming a Rectangle from 2 Triangles		X
WISC	5-15	Picture Completion		X
	5-15	Picture Arrangement		X
	5-15	Block Design		X
	5-15	Object Assembly - Manikin, Horse, Face, Auto		X
	5-15	Coding		X
Arthur	Less than 5 through 15	Manikin and Feature Profile		X
Arthur	Less than 5 through 15	Koh's Block Design		X
Arthur	Less than 5 through 12	Knox Cubes		X
Ontario	Various Levels	Knox Blocks		X
Ontario	Various Levels	Tapping		X
Ontario	Various Levels	Dominoes		X

Items From the Cattell, the Binet, and the Ontario

Tests Arranged According to Year Levels

	Group	
	1	2
<u>Tests Below 2 Year Level</u>		
Cattell: Three Hole Formboard	X	X
Cattell: Block Building	X	X
Cattell: Peg Board	X	X
Cattell: Pencil Tests		X
<u>Tests at 2 Year Level</u>		
Cattell: 2-6 - Differentiates Bridge from Tower	X	X
Binet : Three Hold Formboard (Rotated at 2-6)	X	X
Binet : 4 Block Tower	X	X
Ontario: 3 Block Tower	X	X
Ontario: Paper Folding	X	X
Ontario: Imitative Drawing (Vertical line and horizontal line)		X
<u>Tests at 3 Year Level</u>		
Binet : Stringing Beads	X	X
Binet : Copying a Circle (2-6: Copying a Cross)		X
Binet : Block Building: Bridge	X	X
Ontario: Block Building: Chair	X	X
Ontario: Paper Folding	X	X
Ontario: Copying a Circle		X
Ontario: Copying a Cross		X
Ontario: Discrimination of Norms		X
Ontario: Colour Patterns (Block Designs)		X

Tests at 4 Year LevelGroup
1 2

Binet : Picture Completion: Man		X
Binet : Discrimination of Forms		X
Ontario: Paper Folding	X	X
Ontario: Forms		X
Ontario: Knox Blocks		X
Ontario: Dominoes		X
Ontario: Copying a Square		X
Ontario: Tapping		X

Tests at 5 Year Level

Binet : Paper Folding: Triangle	X	X
Binet : Knot Tying	X	X
Binet : Picture Completion: Man		X
Binet : Copying a Square		X
Ontario: Block Building: Gate	X	X
Ontario: Forms		X
Ontario: Colour Patterns (Block Designs)		X
Ontario: Knox Blocks		X
Ontario: Dominoes		X
Ontario: Copying a Triangle		X

Tests at 6 Year Level

Binet : Copying a Bead Chain for Memory I	X	X
Ontario: Knot Tying	X	X
Ontario: Colour Patterns (Block Designs)		X
Ontario: Knox Blocks		X
Ontario: Dominoes		X

	Group	
	1	2
Ontario: Copying Design		X
Ontario: Tapping		X
<u>Tests at 7 Year Level</u>		
Binet : Copying a Diamond		X
Ontario: Block Building: Steps	X	X
Ontario: Knot Tying	X	X
Ontario: Knox Blocks		X
Ontario: Dominoes		X
Ontario: Copying a Diamond		X
Ontario: Tapping		X
<u>Tests at 8 Year Level and Above</u>	<u>Age Level</u>	
Binet: : Memory for Designs I	9	X
Binet : Memory for Designs II	11	X
Binet : Copying a Bead Chain for Memory II	13	X X
Ontario: Block Building: Cross	8	X X
Ontario: Copying a Star	8	X
Ontario: Design Pair	9,13	X
Ontario: Ring Design	16,17,18	X
Ontario: Healy Fernald	10,12,14	X X
Ontario: Weight Arrangement	9,10,11	X X
Ontario: Colour Patterns (Block Designs)	8-16	X
Ontario: Knox Blocks	8-19	X

	<u>Age Level</u>	<u>Group</u>	
		<u>1</u>	<u>2</u>
Ontario: Dominoes	8-19		X
Tapping	8-19		X

Note: It is very seldom that the visual tests at the higher age levels may be used with the children under discussion.

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