Research Project

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EARLY SCHOOL ENTRY AGE AND SUBSEQUENT SCHOOL ACHIEVEMENT PROBLEMS: AN EXAMINATION OF REFERRALS MADE TO A CHILD GUIDANCE CLINIC

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Organization Outline of Report

Early School Entry Age and Subsequent School Achievement Problems: An Examination of Referrals made to a Child Guidance Clinic

CHAPTER I

I. Study concerned with relationships between age at initial school entry and subsequent school achievement problems.

   A. Clinic staff observed school achievement referral problem pattern.

      1. less mature referred more often.
      2. more mature referred less often.

   B. Study justification.

      1. possible negative impact on less mature.
      2. a need for more professional knowledge.

   C. Background of Problem.

      1. consultation with clinic staff.
      2. consultation with outside "experts".

II. Survey of Literature

   A. Footnotes number 1 through 18.

   B. Conclusion of survey.

CHAPTER II

I. Hypothesis - Immature group referred more often for school achievement problems than is mature group.

   A. Operationally defined terms.

      1. define normal intelligence.
      2. define good health.
      3. define physical infirmities.

4. define school careers.
5. define school achievement problems.

B. Logical steps of hypothesis formulation.

1. observation of specific problems.
2. discussions with staff.
3. selection of school referral area.
4. selection of school entry age area.
5. identification of Muskegon school entry age policy.
6. examination of clinic's closed files.
7. preliminary survey of literature.
8. examination of variables.
9. formulation of hypothesis.

II. Methods of Securing Data

A. Description of clinic record content.

1. initial application for service.
2. clinic psychological report.
3. summary recordings.
4. school report.
5. medical certification.

B. Extraction of data.

1. chronological age
2. sex
3. health evaluation
4. I.Q.
5. grade placement.
6. referral problem.

C. Control of Sample

1. the six factors under II B. above.
2. explaination of Wechsler Scale.

III. Data Analysis.

A. Definition of immature group vs. mature group.

1. sub-division of each group on basis of sex.
2. comparisons and contrast between each of seven sub-catagories.

B. Submission of data to chi-square statistical techniques.

C. Interpretation of data within the limitations of a 0.05 level of statistical significance.

CHAPTER III

I. Following list is result of comparing and contrasting the mature and immature catagories.

   A. Overall mature group vs. Overall immature group.

   B. Immature boys vs. mature boys.

   C. Immature girls vs. mature girls.

   D. Immature boys vs. mature girls.

   E. Immature girls vs. mature boys.

   F. Mature boys vs. mature girls.

   G. Immature boys vs. immature girls.

II. Analyzed data lends limited weight to hypothesis.

CHAPTER IV

I. Majority of findings not within accepted statistical limits.

II. Two items of special interest.

   A. Immature boys significantly referred more often than mature girls for achievement problem.

   B. Achievement problem referrals outnumber other problems in frequency of mention.

CHAPTER V

I. Closeness of data's statistical significance together with trend of data suggests hypothesis has merit.

II. Generalizations based on project's findings.

   A. Chronologically immature children more apt to have school achievement problems than chronologically mature children.

B. Immature boys more apt to have these problems than mature girls.

C. Extreme caution must be used in generalizing on the basis of this project's findings.

APPENDIX

Tables I through VII

BIBLIOGRAPHY

TABLE OF CONTENTS

CHAPTER I

PURPOSE AND BACKGROUND

The Study Problem

This study is concerned with one aspect of the general area of inquiry into possible relationships between the age of children at the time of initial school enrollment and subsequent school achievement.

For a number of years it has been the policy of all school districts within the locale served by the Muskegon Area Child Guidance Clinic to allow children to began their school careers in September of the new school year provided that they will have attained the chronological age of five years by December 1 of that same year. Consequently, a number of children are entered in kindergarten each year who are between the ages of 4.9 (four years-nine months) and 5.0 (five years). Those children who attain age 5.0 on or after December 1 must wait until the following September school opening and are then entered in school between the ages of 5.0 and 5.9. It is readily apparent therefore that this entrance policy has the effect of placing less chronologically mature children (as young as 4.9) in a standard classroom situation together with more chronologically mature children (as old as 5.9) where both catagories are treated and expected to perform as equals. In the course of accepting and processing requests tendered on behalf of the community's children for psychological services, conferences, and counseling the Muskegon Area Child Guidance Clinic routinely deals with a substantial number of school age youngsters together with their parents and representatives of their schools. Over the years it has often seemed to the staff of the Clinic that school achievement problems are more frequently mentioned in the referrals of those

child-clients who have entered school at an early chronological age level as opposed to the referrals of those children who have entered school at a relatively more advanced chronological age level. This study is directed, therefore, toward ascertaining, in a fashion more precise than that afforded by casual observation, whether or not children who start school at a comparatively early chronological age level are referred more often to the Clinic for school achievement problems than are children who start school at a chronologically more mature age. The importance of pursuing research in the general area of possible relationships between school entry age and school achievement as well as the rationale for the proposed study outlined above will be treated upon in the following section. For purposes of reference school achievement problems are to be defined as difficulties in any area of scholastic achievement in any subject taught in the elementary grades provided said difficulties are considered serious enough to warrant specific referral to the Clinic for psychological evaluation because of them.

Justification of the Study

In general, it may be said that one of the chief reasons for the need of research in the proposed area stems from the increasing complexity of life itself. Many people today regard education as a prerequisite to personal, social, and vocational opportunity, and they consequently desire to accelerate the education of their children by entering them as early as possible in the school setting. Other parents, working outside the home, desire school services for care and attention of children during working hours, and still other parents send their relatively young children to school because they feel the children to be superior mentally or because they desire more free time for social and personal pursuits. On occasion, some parents may send a young child, who is

poorly adjusted socially, to school in the hope that his experience there will have a positive therapeutic effect upon him. In any event, the question invariably arises as to what positive or negative effects a relatively early entry into school has on subsequent school achievement.

This writer, in his capacity as a graduate social work student, working in a child guidance clinic setting, has often been called upon to interpret to schools and to parents the results of psychological tests administered to children referred because of school achievement problems. He has also been called upon to work, on a guidance and counseling basis, with the parents of these children as well as with parents comtemplating early school entry for their youngsters. Occasionally, he is asked to voice his opinions in school conferences as to what factors enter into school achievement successes or failures. These duties are, of course, not unique to this writer and are undertaken by his clinical social worker peers as well. It is readily apparent, therefore, that the nature of clinical social work function in the Muskegon Area Child Guidance Clinic demands that social work practioners have special knowledge of factors related to school readiness and achievement. It is for all of these reasons then, that this student researcher would submit that the proposed area of investigation is pertinent and relevant to social work research as well as to the staff of the Muskegon Area Child Guidance Clinic as a whole. More specifically it is hoped that this project will give impetus and direction to projects that follow. It must be noted that this undertaking can serve only as a beginning. Its purpose is to determine whether referrals specifically mentioning school achievement problems occur more frequently than could be explained by mere chance in the chronologically less mature school entry group as opposed to the chronologically more mature school entry group. It is <u>not</u> within the scope of this project to investigate possible relation-

ships between school entry age and subsequent difficulties with any or all of the various components of school achievement itself. It is hoped, however, that any such relationships, actual or suggested, which may come to light as a result of this project, will provide hypotheses for research of a nature more refined than is this undertaking. In short, it is felt that the establishment of a frequency relationship such as that indicated above would justify further and more sophisticated investigation of direct relationships between school entry age and the components of overall school achievement.

Background of the Study Problem

Since this project is in effect concerning itself with one aspect of the general area of inquiry into possible relationships between age at time of school entry and subsequent school achievement it must necessarily consider first the synthesis of the thinking of others aware of and/or concerned with the general problem. As has been indicated above it has been assumed by the Muskegon Area Child Guidance Clinic staff members that chronological age is likely to be an important factor in school readiness. However, it would be the consensus of opinion of the staff as a whole that chronological age alone is not the only factor involved. Prominently mentioned as other factors of school readiness, and which consequently are considered as numbering among determinates of school achievement are mental age as measured by individual intelligence tests, physical maturity, social and emotional adjustment, sex (because it is held that boys more frequently than girls have difficulties in school achievement), motivation, richness of and extent of pre-school experiences, attitudes of parents, creativity, reading readiness, and socio-economic status.

Although none of the people interviewed professed to be nor are held to be experts in this general field of inquiry it should be noted that among

their number was a school psychologist and a school principal, both employed by the Muskegon area school system. They, like the Clinic staff, have the impression that there is a relationship between school entry age and successful or unsuccessful school achievement. As is indicated this is an impression only. They are likewise in agreement with the Clinic staff that chronological age cannot stand alone as the prime determinate of school achievement. They, too, see the other factors already mentioned as being of significant importance.

It should be noted that although this general problem of school entry age and subsequent school achievement has been one of long standing neither the Clinic staff nor the school personnel interviewed have submitted any aspect of it to a formalized research procedure.

The apparent universal nature of this problem suggests that a discussion of its history together with a more complete synthesis of thinking concerned with it be presented in the following section.

Survey of Literature

In his treatment of the essential features of the American public school system, Cubberly[1] points out that the problem of "underage beginners" arose out of a multiplicity of developments. Historically, children entered school when they were sufficiently mature to walk the required distance to school and to be away from home. Common experience dictated that six, seven, or eight were the acceptable ages for entering school. These ages were consequently incorporated into the compulsory school attendance laws. Over the years some states began to encourage the provision of formal schooling for children under six by permitting children four to six or five to six to attend when

[1]Cubberly, Elwood P., Public Education in the United States., Boston: Houghton Mifflin Company, 1934.

average daily attendance was calculated as a basis for state aid. The acceptance of the kindergarten and the nursery school as integral phases of the elementary-school program can be considered a contributing factor to such a provision. In short, it can be said that within the framework of popular opinion and legislation it has become almost standard practice to admit children to formal schooling at age six or younger.

Although the difficulties of Cubberly's "underage beginners" date back to the Colonial period this writer's resources were not that all inclusive and in the material available to him he was able to find first mention of studies reasonably relevant to the problem at hand in manuscripts dated from the 1930's on.

As one peruses the literature of the early 1930's one gets the impression that this was the era when it was first felt that a child's academic achievement, or lack of it, was in part determined by his having attained a certain mental age which in turn would facilitate reading readiness. In 1931, a study[2] was done on the question of when children should begin to read. Conclusions reached which are relevant to the project at hand were:

1. Correlations between mental age and ability to learn to read, as measured by reading progress and sight-word scores, showed a fairly high degree of relationship. The correlations ranged from .50 to .65.

2. Mental age alone showed a better degree of correlation with reading progress than did the intelligence quotient or the average of mental and chronological ages.

3. Children who had a mental age of six years and six months made far better progress than did the less mature children.

This report was widely applauded in educator circles. The matter might have been settled right there with all children being admitted to school soley

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[2] Morphett, Mabel V., and Carleton Washburn, "When Should Children Begin to Read", Elementary School Journal, XXXI (March, 1931), pp. 496-503.

on the basis of mental age and reading readiness. Practical considerations prevented this however. In his analysis of the implications for administration and curriculum that grew out of the large numbers of pupil failures in first grade, Otto[3] noted that school entrance on the basis of mental age alone would present numerous complications, since some children would be seven, eight, or nine chronologically before reaching a mental age of six and a half. He come to the conclusion that the only defensible policy would be to admit on the basis of chronological age and to provide such flexibility in organization, curriculum, and teaching procedures that the educational needs of various types of first grade pupils would be cared for adquately.

A major experimental study dealing specifically with underage children was made by Bigelow[4] in 1934. She catagorized her subjects according to chronological age and mental age and then studied academic achievement in each category. Conclusions reached which are relevant to the project at hand were:

1. If a child is chronologically between six years old and six years and four months old and has an intelligence quotient of 110 or over, he is practically certain to succeed in school.

2. A child less than six years old chronologically with an intelligence quotient of 120 or over will probably succeed, but personality factors should also be considered.

3. If a child is below six years old chronologically and has an intelligence quotient below 110, his chance of success is small.

4. Children below six years old chronologically with intelligence quotients of 110 - 19, inclusive, and children chronologically between six years old and six years and four months old with intelligence quotients of 110 - 19, inclusive, have a fair chance of success.

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[3]Otto, Henry J., "Implications for Administration and Teaching Growing Out of Pupil Failures in First Grade", Elementary School Journal, XXXIII (September, 1932), pp. 25-32.

[4]Bigelow, Elizabeth, "School Progress of Under-Age Children", Elementary School Journal, XXXV (September, 1934), pp. 186-92.

5. If a child is below six years old chronologically and has a mental age of six years and ten months or above, he is practically certain to succeed in school. If his mental age is between six years and eight months and six years and nine months, inclusive, he has a good chance of success.

6. A child chronologically between six years and six years and four months of age has a good chance of success if his mental age is six years and four months or above.

7. A child who is chronologically below six years and four months of age and whose mental age is below six years has practically no chance of success.

Thus Bigelow was enabled to establish rather definite limits for mental age requirements for certain levels of expected achievement among young children.

Moving out of the 1930's and into the 1940's there comes to light an investigation[5] concerning the value of kindergarten classes and the factors involved in first grade entrance age. Findings relevant to the project at hand were:

1. Although state law usually sets up five years as the minimum chronological age requirement for grade one, there is a tendency to raise it to six years, or at least to a few months before six years.

2. Factors which play an important part in school entrance, besides chronological age, are reading readiness; results as shown by mental tests; and physical, social, and emotional maturity.

3. Many school systems would recommend stronger emphasis on mental and reading-readiness testing before admission to school and a subsequent raising of the age requirement.

Few research findings or expressions of opinion concerning the problem of early school entry were found to have been published during the World War II years, 1941-45. However, in 1946, a study[6] particularly relevant to the project at hand was published. In its summary its authors note:

"that some authorities state that the mental age of a child should be six and one half years to permit successful achievement in the average

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[5] Hausman, Estelle J., "Ready for First Grade", School Executive, LIX (February, 1940), pp. 25-26.

[6] Edmeston, R.W., and C.E. Hollahan, "Measures Predictive of First-Grade Achievement", School and Society, LXII (April 12, 1946), pp. 268-9.

first grade. If one considers normal IQ's to extend from 70 upward, normal children of six years chronological age would vary from approximately four years and three months to seven years and nine months in mental age. These considerations indicate that mental age is a better criterion for entrance to school than is chronological age. However, readiness, social adjustment, health, socio-economic background, and motor coordination may be effective factors in the success of the first grader. The non-ready first-grader soon feels that school is the place where he is asked to do what he cannot do. Certainly the possible results of this situation justify the expenditure of both time and money for its eradication."

In summary of the survey of literature to this point it can be said that many of the early studies strongly suggested that a child needed to have a mental age of about six and half years as the minimum for success in school. This was based on the premise that such a mental age was a prerequisite for learning to read. A study by Gates[7] seems to question the validity of such a hypothesis:

"... it has by no means been proved that a mental age of six and a half years is a proper minimum to prescribe for learning to read by all school methods, or organizations, or by all types of teaching skill and procedures. It is quite conceivable - indeed the evidence in general tends now definitely to show - that the crucial mental age will vary with materials; the type of teaching; the skill of the teacher; the size of the class; the amount of preceding preparatory work; the thoroughness of the examination; the frequency and the treatment of special difficulties, such as visual defects of the pupil and other factors."

Gates' conclusions would seem to suggest, then, that a variety of factors other than mental age alone contributes to total reading readiness and that any attempts to set school admission requirements on the basis of mental age alone would not be satisfactory.

Before going on to consider some of the more recent studies concerned with the general problem under consideration it is interesting to note the results of a study[8] comparing the differences in achievement between boys

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[7]Gates, Arthur I., "The Necessary Mental Age for Beginning Reading", Elementary School Journal, XXXVII (March, 1937), pp. 497-98.

[8]Pauly, Frank R., "Sex Differences and Legal School Entrance Age", Journal of Educational Research, XLV (September, 1951), pp. 1-9.

and girls. The conclusions and implications of the study are as follows:

> "Boys usually develop in nearly all respects more slowly than girls. Much of the research in sex differences indicates that girls should be admitted at least three or four months younger than boys; or better, that the entering age for boys should be raised three or more months. The implications are a) that if this lower maturation rate for boys is accepted, all educational and mental age norms published should be revised to provide norms for each sex. b) In all likelihood the mental hygiene of many immature boys would be improved if a later entering age can be established for boys than for girls."

As one reads through the relevant literature one senses that the major inconsistency in the problem area arises from the fact that while many schools have lowered the entrance age requirements for school entry, they have at the same time done little to revise the program of expectations for beginning work and continue to attempt to impose the traditional curricular requirements of the entry grade upon all children, whether underage or normal age. Hamalainen[9] was concerned with this inconsistency when he attempted to determine by questionnaire the opinions of 31 school principals, concerning the adjustment of both underage and overage children as they progressed through grade school. He reports that:

1. Twenty-four percent of the children entering kindergarten under a September age of four years and nine months have had a difficulty in adjusting to school as compared with six percent of the normal age children who had difficulty.

2. Both under-age and over-age children face more school problems than children of normal age. Their problems are principally in the area of social and emotional adjustment.

Dealing even more specifically with this inconsistency Altmann[10] warns teachers of young children to:

> "remember to take the child where he is. If he hasn't reached maturation for different stages of development, you might just as well realize that he just can't develop past a certain point. The immature child hasn't any place in kindergarten or first grade but some school systems and

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[9]Hamalainen, Arthur E., "Kindergarten-Primary Entrance Age in Relation to Later School Adjustment", Elementary School Journal, LII (March, 1952), pp. 406-11.

[10]Altmann, Yvonne M., "Readiness for First Grade", American Childhood, XXXIX (January, 1954), pp. 18-23.

parents expect children to be accepted in kindergarten and first grade at a certain chronological age. The immature child will become very unhappy if he is pushed beyond his capacity. He needs much understanding and love. A pre-first grade or transitional first grade is the answer to the problem of the immature first grader."

In 1955, a study[11] was done which seems to indicate that having attained a few additional months of chronological age at time of school entry is an important factor in the child's ability to meet imposed restrictions and tensions that the school setting necessarily presents. The study concludes that:

1. Younger entrants will have difficulty attaining up to grade level in academic skills, and a large portion of them will fall far below grade level standards. Older entrants are more likely to achieve up to and beyond grade level standards.

2. A larger number of the younger entrants will repeat a grade.

3. More boys than girls will repeat a grade.

4. Average daily attendance will be lower among younger entrants.

5. Younger entrants are likely to show some indications of poor personal and social adjustment in school.

Before giving some necessary consideration to the social and personal adjustment of the underage school entrant, which together with school achievement make up the bulk of scholastic attainment for him, a brief presentation of some of the reasons causing acceleration of children in school is now made. Typical of the several reports on this phenomenon is the treatment given it by Strickland and Plichta[12] who point out a number of reasons accounting for it. Some of these reasons are:

1. The complexity of American life causes people to look upon education as a prerequisite to personal, social, vocational opportunity and they wish to speed up the formal education of their children.

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[11] King, Indez B. "Effect of Age of Entrance into Grade 1 upon Achievement in Elementary School", Elementary School Journal, LIII (February, 1955), pp. 331-36.

[12] Strickland, Ruth G., and Phyllis Plichta, "Age of Entrance into First Grade", Bulletin of School of Education, Indiana University, XXV (January, 1949), pp. 7-12.

2. Families living in crowded residential areas with no play space want to send children to school as early as possible to provide playground opportunities.

3. Some mothers wish to send their children to school as early as possible to give the mother more free time for her social, recreational, and domestic activities.

4. Some school systems use acceleration as a means of challenging the bright pupils because it is an easy "mechanical" method.

The question now arises as to what effects early or late school entry may have not only on the children's school achievement but on the children themselves. In short, where does the child's social and personal needs enter into the scheme of things here. In discussing this particular aspect of the general problem Jennings[13] states that

> "all learning in school takes place within the setting of pupil-pupil relationships. Academic learnings in the school cannot be separated from the social atmosphere in which it takes place. Most teachers realize that the individual's personal and academic growth can be affected adversely or favorably by his position in the group, and that all pupils stimulate or thwart each other in many ways."

In this same vein, Stendler and Young[14] see social adjustment as a very real problem for the early school entrant.

> "The underage entrants to school appear to be at a distinct disadvantage from the standpoint of personal and social adjustment. The younger entrants are likely to show more indicators of poor personal adjustment and social adjustment in school. The lack of overall maturity seems to be noticeable in the first three grades and to a lesser extent, in all subsequent grades."

The few remarks above which comment on the social and emotional adjustment of school children are illustrative of the opinions offered in other literature to the effect that the underage school entrant is in unfair competition if he tries to keep abreast with other children of similar mental abilities who have other maturities exceeding those of the younger child.

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[13] Jennings, Helen H., Sociometry In Group Relations, Washington: American Council on Education, 1948.

[14] Stendler, Celia B., and Norman Young, "The Impact of Beginning First Grade Upon Socialization as Reported by Mothers", Child Development, XXI (December, 1950), pp. 241-260.

For the most part the literature seems to reflect the viewpoint that many of the underage school entrants never realize their optimal leadership capacities and other indicators of healthy social growth which they very likely would have done in their own normal age group.

Turning once again to the area of academic achievement one finds a pertinent and relatively recent study dealing with the importance of age on school performance. In this study, Buhler[15] divided pupils in each elementary school grade (in one elementary school) into three groups - oldest, middle, and youngest. She found that reports on school performance as well as marks in individual subjects bore a clear relationship to the respective age levels of the pupils. In each of the seven grades, the oldest children of a grade showed consistently higher academic achievement than the middle group which in turn was superior to the youngest.

Finally, and in conclusion of this section on the survey of literature, this writer would like to refer to Hildreth[16] who feels that the real problem of school entrance age is to determine a minimum age standard for school entrants that will exclude children who are too young to progress satisfactorily. She points out that:

> "...the only research findings that have much bearing on the problem are those that tend to show that in the conventional first grade, children tend to fail unless they have a mental age of about six years and four months at the time of entrance. Only brighter children and those who are nearing six and a half by the opening of school in September make good progress with the traditional first grade program."

In view of all of the literature surveyed to this point then, it would seem that there is good cause to believe that there is a relationship of significance between chronological age at time of school entry and subsequent

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[15] Buhler, Charlotte, From Birth to Maturity, London: Routledge and Kegan Paul, Ltd., 1951.

[16] Hildreth, Gertrude, "Age Standards for First Grade Entrance", Childhood Education, XXIII (September, 1946), pp. 22-27.

school adjustment. It would therefore not be surprising to find that children starting school at a comparatively early chronological age are referred more often to the Muskegon Area Child Guidance Clinic because of school achievement problems than are children who start school at a chronologically more mature age.

CHAPTER II

METHODS OF THE STUDY

The Hypothesis

The working hypothesis of this study is:

Children of normal intelligence, in good health, and without physical infirmities, who begin their school careers within a chronological age range of 4.9 (four years-nine months) to 5.0 (five years) are referred more often to the Muskegon Area Child Guidance Clinic because of school achievement problems than are children of normal intelligence, in good health, and without physical infirmities, who begin their school careers within a chronological age range of 5.6 (five years-six months) to 5.9 (five years-nine months).

The terms used in the hypothesis are defined operationally as follows:

Normal Intelligence

For the purpose of this study Wechsler's definition[17] of intelligence is adhered to ..."Intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment." Intelligence considered "normal" within this definition would fall within the intelligence quotient range of 90 - 110.[18] In this study, all of the children in the sample will have been previously been tested for intelligence quotient by the same clinical psychologist using the same recognized and uniform intelligence test (to be described in another section). It is to be understood that holding I.Q. constant when selecting the sample is done only for the purpose of ruling out of the sample mental defectives. No claim is made for the validity or reliability of the I.Q. test other than to say that it is used in all Michigan Child Guidance Clinics as an accepted indicator of intellectual functioning.

Good Health

For the purpose of this study the term "good health" is applied only to those children certified by a state-licensed medical physician to be free of all known physical illnesses and/or diseases.

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[17] Wechsler, David, The Measurement of Adult Intelligence, Baltimore: Williams & Wilkins, 1944, p.3.

[18] Ibid., p.40.

Physical Infirmities

For the purpose of this study the term "without physical infirmities" is applied only to those children certified by a state-licensed medical physician to have full possession and full use of all body extremities E.G. arms, legs, fingers, toes, and who is also certified to have full control over all body functions E.G. walking, running, sitting, standing.

School Careers

For the purpose of this study the term "begin school careers" is used in conjunction with those children who began school at the kindergarten grade level within the indicated chronological age ranges.

School Achievement Problems

For the purpose of this study the term "school achievement problems" is defined to mean any hint or trace of an inability to gain required knowledge or understanding of, or skill in, by study, instruction, or investigation, any required subject taught in the elementary grades (kindergarten through grade 7) of all schools within the locale served the Muskegon Area Child Guidance Clinic; provided, that said inability is considered serious enough to warrant specific referral to the Clinic because of it. It is to be understood that said referral can be made by any interested party.

The reader will note that the two age groups 4.9 to 5.0 (four years, nine months to five years) and 5.6 to 5.9 (five years, six months to five years, nine months) referred to in the hypothesis are separated by a chronological age span of 0.6 (six months). This arbitrary separation was made so that subsequent comparisons and contrasts between the two groups would stand forth more sharply.

Logical steps leading to the final formulation of the working hypothesis were:

a) casual observation of specific problems presented during clinic intake.

b) discussion with clinic staff members re: personal opinions about causes of said specific problems.

c) selection of the general area of school referrals.

d) selection of the specific area of school entry age-school achievement.

e) identification of the permissable school entry age in the Muskegon school district.

f) cursory check through the Clinic's closed case files for the purpose of looking at school entry ages together with specific reasons for referral.

g) preliminary survey of literature re: school entry age - school achievement.

h) an examination of variables entering into successful or unsuccessful school achievement.

i) formulation of the specific hypothesis.

In the process of analyzing the problem initially posed for the study a number of other hypotheses suggested themselves. Some of these such as a relationship between mental age and school achievement, sex (male or female) and school achievement, physical maturity and school achievement, etc., have been discussed in the survey of literature. The present hypothesis was selected from these because the Clinic records which have been utilized are extremely limited in terms of providing reliable and valid measurements of mental age, physical maturity, and other such complex variables. On the other hand the records provide quite adquate and factual imformation re: chronological age at time of school entry, sex, medical evaluations, school grade reports, and specific referral problem. Verification of the hypothesis chosen for this study was not expected to show that the other hypothesis are irrelevant.

The Data: Method of Securing Them

The data collected has been drawn entirely from information entered in the case records of the Muskegon Area Child Guidance Clinic. The content of these records includes:

1) The initial application for service which is filled out by the referral source E.G. Parent, Teacher, Physician, etc. A completed application includes:

   a) name, age, sex, race, school and school grade, religion, address and phone number (if any) of the referred client.

b) names, ages, sexes, race, occupations, addresses and phone numbers of the client's parents and brothers and sisters (if any).

c) a description of the referral problem and how the problem is displayed.

2) The Muskegon Area Child Guidance Clinic Psychological Report. A completed psychological report includes:

a) name, birthdate, and referral problem of the client.

b) the examining psychologist's subjective impression of the client.

c) the results of the psychological examination which include:

(1) Intelligence quotient.
(2) Oral reading grade level.
(3) Evaluation of emotional and physical development.

d) discussion of findings.

3) Summary recordings of interviews held by the staff with the client and interested parties.

4) School report which includes:

a) the client's age at time of school entry.

b) report of academic achievement to date.

c) estimation of the client's social and emotional growth to date.

5) Medical certification of the client's state of physical well-being.

With the exception of the always ongoing summary recording the contents of the case records are completely assembled within a week of the initial application. In their entirety the case records are used for the diagnosis of the problem and for the formulation of the treatment plan (if any).

The data, which has been personally extracted by this writer, is specifically as follows:

1) chronological age at time of school entry.

2) sex of client.

3) medical evaluation of client's overall physical health.

4) intelligence quotient.

5) grade placement at time of referral.

6) specific referral problem.

This writer did not anticipate any factors related to the case records and their reading which will impair, limit, or otherwise affect the data.

Sampling

For the purpose of this project that procedure known as "stratified random sampling" has been utilized. The closed case file at the Muskegon Area Child Guidance Clinic furnished the case records of the units in the sample. Out of the last 1000 closed cases were selected 200 case records for sample. 100 of these case records were those of children whose record indicates a school entry age of 4.9 to 5.0 years. 50 of these 100 case records were those of boys and consequently 50 were those of girls. The remaining 100 case records were those of children whose record indicates a school entry age of 5.6 to 5.9. These latter 100 cases were also subdivided equally on the basis of sex. All 100 children in the total sample have been referred to the Clinic at some time during their elementary school careers (kindergarten through grade 7). All have been found to have intelligence quotients ranging from 90 to 110. The total sample was further restricted to monoligual, physically healthy children who are not physically disabled or incapacitated in any discernable fashion E.G. blind, crippled, deaf. There was no way, except for undesirable subjective judgement, to estimate the socioeconomic status of the sample units from the data available. It must be noted that the specific referral problem was completely and necessarily ignored in

selecting the total sample. Because of the restrictions placed on the selection of the sample this writer did not expect to find many more than 200 out of 1000 cases which fit the exacting requirements. In view of this, it is felt that the sample is highly representative of the specific universe in question.

Control of the Sample

As indicated above the factors controlled in this study are: chronological age ranges at time of school entry; sex of the clients; physical well-being of the clients; school grade at time of referral; intelligence quotient. Age at time of school entry is controlled because a relationship between it and school achievement is being sought. Physical well-being (already defined) is controlled so that physical illness or incapacity will not have interferred with school achievement. School grade at time of referral was arbitrarily chosen to be controlled in order to set limits on the sample. Sex of the clients is controlled so that contrasts and comparisons can made between the two study groups on the basis of sex as well as age. Intelligence quotient is controlled so that the sample is representative of what is termed children of "normal intelligence" (already defined). This is done to rule out of the sample children who could be classified as mentally defective or mentally superior when compared with other children in the sample. The Wechsler-Bellevue Scale, Form I is the instrument used to measure the intelligence quotient of all children seen by the Clinic. This test is the preferred instrument in Michigan child guidance clinics for evaluating the intelligence of youngsters. It consists of five verbal subtests (information, comprehension, digit-span, arithmetic, and similarities) and five performance subtests (picture completion, picture arrangement, object assembly, block design, and digit symbol substitution). The Wechsler scales afford much material for qualitative diagnostic evaluation and they are held to give a highly valid quantitative measure of mental capacity. No claims are

made in this paper for the validity of the Wechsler's measurements. However, it is felt that said measurements have provided a reasonably effective means by which to limit the sample to children of "normal intelligence".

Failure to control all of the factors mentioned above (with the exception of school grade at time of referral) would make possible their influencing successful or unsuccessful school achievement. Unfortunately there was no means available to this writer to identify and control mental age. The survey of literature has indicated that this would be desirable.

Analysis of Data

When the sample was selected and catagorized into the two previously indicated school entry age groups and when each age group was further sub-divided on the basis of sex, the specifically stated problem for which each unit of the total sample was referred to the Clinic was read and duly noted. The number of specific referrals for school achievement problems (defined above) for each catagory (and sub-catagory) was extracted and counted. The result was a count of the number of specific school achievement problem referrals made for each age-sex catagory. Contrasts and comparisions were then made between the following catagories with respect to the number of specific school achievement problem referrals within each catagory. (The 4.9 to 5.0 school entry age group will be referred to below as "immature" - the 5.6 to 5.9 school entry age group will be referred to as "mature").

1) The overall immature group with the overall mature group.
2) The immature boys with the mature boys.
3) The immature girls with the mature girls.
4) The immature boys with the mature girls.
5) The immature girls with the mature boys.
6) The immature boys with the immature girls.

7) The mature boys with the mature girls.

Since this study is concerned with contrasts and comparisons between these seven groupings, in terms of the number of school achievement problem referrals occuring in each, it utilized that statistical technique known as "chi-square" as its statistical instrument of analysis. To this end each of the seven groupings were submitted to a four cell square for the purpose of determining whether differences in the number of said referrals between the components of each groupong are statistically significant. Using grouping number 2 from the seven groupings the following example of the four cell square is presented:

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems
immature boys		
mature boys		

The chi-squared result and the probability value has been calculated and will be presented. Separate four cell squares for each grouping, each with its own chi-square and probability calculation, will be presented in the last section of this report and will be termed and numbered "Table I" through "Table VII".

Interpretation of Data

Essentially this study is concerned with determining whether referrals specifically mentioning school achievement problems occur more frequently

than could be explained by mere chance in the chronologically less mature school entry group as opposed to the chronologically more mature school entry group. This has been accomplished by submitting grouping number 1 (see above) to the chi-square test. In order to refine the analysis further each of the remaining 6 groupings have also been submitted to the chi-square test and for the same reasons of comparison as grouping number 1. The 6 additional groupings will also provide a greater variety of contrast as well as of comparison.

Based on discussion and on the survey of literature it was expected that relationships of significance would have been found in the following areas:

1) Referrals specifically mentioning school achievement problems will have occured more frequently than could be explained by mere chance in the chronologically less mature school entry group as opposed to the chronologically more mature school entry group.

2) Immature boys will have been referred more often for said problem than mature boys.

3) Immature girls will have been referred more often for said problem than mature girls.

4) Immature boys will have been referred more often for said problem than mature girls.

5) Immature girls will have been referred more often for said problem than mature boys.

6) Mature boys will have been referred more often for said problem than mature girls.

7) Immature boys will have been referred more often for said problem than immature girls.

For the purpose of this paper a level of statistical significance equal to .05 for each of the seven groupings will be considered acceptable. Attainment of such a level of significance in any or/all groupings will be considered an indication that a significant difference exists between the observed frequency and the expected frequency of the aforementioned referrals within each

In conclusion of this section it must be noted that there have been many other factors brought to light in the survey of literature which are thought to enter into successful or unsuccessful school achievement. Any relationship of significance brought to light by this study with regard to school entry age and subsequent referral to the Clinic because of school achievement problems must be considered subject to modification by all of those factors mentioned but not controlled for E.G. mental age, socio-economic status, school achievement subject to interpretation by any interested party, etc. In short, this study can only hope to provide direction for studies more sophisticated and refined than this one.

CHAPTER III

RESULTS OF THE STUDY

The following list of findings is the result of comparing and contrasting the mature and immature catagories referred to on page 23.

1) The Mature School Entry Group vs. The Immature School Entry Group.

The analyzed data shows that referrals specifically mentioning school achievement problems have occurred more frequently in the chronologically less mature school entry group than in the chronologically more mature school entry group. This finding was at the 10 per cent level of statistical significance[1] and therefore does not fall within the prescribed limits of the 5 per cent level of statistical signigicance considered acceptable for this study. However, this finding definitely suggests that as far as the caseload trend of the Muskegon Area Child Guidance Clinic is concerned the referrals of children falling into the immature catagory will mention school achievement problems more frequently than the referrals of children falling into the mature catagory.

2) Immature Boys vs. Mature Boys

The study results show that referrals specifically mentioning school achievement problems occurred more frequently with regard to the immature boys than with regard to the mature boys. This finding was at the 20 per cent level of statistical significance[2] which while not falling within the limits specified for this study tends to lend some measure of credence to this particular sub-hypothesis.

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[1] See Table I on page 33

[2] See Table II on page 33

3) Immature Girls vs. Mature Girls

The statistically analyzed data shows that although referrals specifically mentioning school achievement problems occurred more frequently with regard to immature girls than with regard to mature girls this frequency is not significantly important. This finding was at the 50 per cent level of statistical significance[3] which indicates that the frequency of occurrence had an equal chance of going either way.

4) Immature Boys vs. Mature Girls

This particular finding shows that referrals specifically mentioning school achievement problems occurred much more frequently with regard to immature boys than with regard to mature girls. This finding was significant at the 2 per cent level[4] and as such was the only one found to be significant within the limits considered acceptable for this study.

5) Immature Girls vs. Mature Boys

The data gathered shows that referrals specifically mentioning school achievement problems occurred with equal frequency in the cases of the immature girls and the mature boys. Statistical analysis[5] showed this equal frequency of occurrence to be absolutely non-significant.

6) Mature Boys vs. Mature Girls

The findings show that referrals specifically mentioning school achievement problems occurred more frequently in the case of the mature boys as opposed to the mature girls. This particular finding was at the 50 per cent level of statistical significance[6] however and could have gone either way.

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[3] See Table III on page 34
[4] See Table IV on page 34
[5] See Table V on page 35
[6] See Table VI on page 35

7) Immature Boys vs. Immature Girls

This finding shows that referrals specifically mentioning school achievement problems occurred more frequently with regard to immature boys than with regard to immature girls. The 20 percent level of statistical significance[7] indicates that this is a slightly more than happenstance occurrence.

[7] See Table VII on page 36

CHAPTER IV

DISCUSSION OF FINDINGS

The findings referred to in Chapter III tend to lend some positive weight to this study's major hypothesis that children who begin their school careers at a relatively early chronological age are referred more often for school achievement problems than are children who begin school at a relatively later chronological age.

The findings also indicate that school achievement referrals tend to occur more frequently in the case of boys than in the case of girls. As such, the direction of the over-all findings parallels the thinking of the staff of the Muskegon Area Child Guidance Clinic as well as the synthesis of thinking on this subject as presented in the literature surveyed.

It must be kept in mind, however, that for the most part the findings did not fall within the prescribed limits of acceptable statistical significance. It cannot be said therefore that the major hypothesis has been adequately confirmed. By the same token it cannot be said that the majority of the sub-hypotheses have been adequately confirmed.

Beyond the general but not acceptably signigicant tendency of most of the findings to support the hypotheses two items of special interest stand out.

The first of these is the highly significant finding[1] that referrals specifically mentioning school achievement problems occurred much more frequently in the case of immature boys than in the case of mature girls. More than any other finding this one lends much support to the hypothesis that mature children

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[1] See Table IV on page 34

are referred less often for school achievement problems than are immature children. It is immediately apparent however, that this holds true only in the case of immature boys vs. mature girls. The high degree of significance does not hold true in the case of the over-all immature group vs. the over-all mature group[2] nor does it hold true in the case of immature girls vs. mature boys[3] where the degree of statistical significance is in fact nil.

In short, what this particular significant finding seems to be pointing out primarily is that mature girls have a definite edge over immature boys in coping successfully with school achievement problems and that sex seems to be as much a factor here as chronological age. The tendency of both immature and mature girls as a group to be referred less often for school achievement problems than are immature and mature boys as a group is prevalent in the findings. This data could well serve as the basis for a new hypothesis i.e. that girls are less likely to be referred for school achievement problems than are boys.

The second item of special interest is the unanticipated finding that all of the units in the total sample had school achievement difficulties mentioned in their referrals more frequently than any other problem. On first sight this finding might be considered significantly descriptive of the majority of referrals made to the Clinic. However, extreme caution must be exercised when considering this data. First and foremost it must be kept in mind that this entire study concerned itself with referrals which were written out by parents, teachers, interested parties, etc. These persons described the problem as they saw it. It is not held by this study that these descriptions were found to be accurate appraisals or diagnoses. It is quite possible that referrals mentioning school achievement problems were in error and that the real problem as diagnosed later by the Clinic had little or nothing to do with school achievement. Secondly,

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[2]See Table I on page 33

[3]See Table V on page 35

it must be kept in mind that this study's definition of school achievement[4] is extremely broad and all-inclusive and as such may have covered more referrals than was intended. It is readily apparent, of course, that both of these limitations must be considered when estimating the entire reliability of this total study.

In any event the possibility that school achievement problems make up the bulk of all referrals made to the Clinic is an intriguing one and could serve as the basis for further hypotheses.

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[4] See page 16.

CHAPTER V

CONCLUSION

Of basic interest at this point are what generalizations if any can be made on the basis of this projects findings.

As pointed out earlier in this text the majority of findings were found to fall outside the limit of statistical significance designated as acceptable for this study. Never-the-less the majority of the findings were in fact quite close to the designated limit. Added to this was the direction of the trend set by the findings, most of which lent limited support to the hypothesis that referrals specifically mentioning school achievement problems have occurred more frequently in the chronologically less mature school entry group than in the chronologically more mature school entry group. The relative closeness of the data's statistical significance together with the trend set by the data in its entirety strongly suggests that the major hypothesis has a good deal of merit. If this be so than it could be generalized from the hypothesis and the findings supporting it that children who start school at a relatively early chronological age are more apt to have school achievement difficulties than are children who start school at a relatively later chronological age. This would be particularly true in the case of immature boys vs. mature girls as has been pointed out above. In any event this generalization could easily be turned into a hypothesis for testing purposes.

The implications of a hypothesis such as the one investigated by this study appear to be many. For instance, at first sight it might seem that children should not enter school until they have at least reached an age span ranging from five years-six months to six years. On the other hand it may

seem sufficient merely to hold the male children back until they reach this age span while at the same time allowing the female children to begin their school careers at an earlier age. To arrive at conclusions such as these on the basis of this study alone would not be prudent. As has been pointed out repeatedly throughout this text there are a good many factors which could enter into school achievement problems i.e. mental age, organic brain damage, emotional trauma, hidden physical affirmaties, etc. This limited project could not control for these variables.

What this study has tried to do however, is to look at associations between chronological age at time of school entry and subsequent school achievement problem referrals to the Clinic. It has succeeded in showing a limited association in this area and along the way has provided some additional hypotheses concerned with the general topic of school readiness. It is quite apparent that the study is a rough one but it is submitted with the hope that it may possibly provide direction for later studies of a more sophisticated nature.

Joseph W. Holmes
May 26, 1964

APPENDIX

Tables

Table I

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Group	53	47	100
Immature Group	65	35	100
	118	82	200

$X^2 = 2.976$

df = 1

$P < 0.10$

Table II

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Boys	29	21	50
Immature Boys	36	14	50
	65	35	100

$X^2 = 2.152$

df = 1

$P < 0.20$

Table III

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Girls	24	26	50
Immature Girls	29	21	50
	53	47	100

$$X^2 = 1.000$$

$$df = 1$$

$$P < 0.50$$

Table IV

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Girls	24	26	50
Immature Boys	36	14	50
	60	40	100

$$X^2 = 6.000$$

$$df = 1$$

$$P < 0.02$$

Table V

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Boys	29	21	50
ature Girls	29	21	50
	58	42	100

$X^2 = 0$

df = 1

P < 0

Table VI

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Mature Boys	29	21	50
ature Girls	24	26	50
	53	47	100

$X^2 = 1.000$

df = 1

P < 0.50

Table VII

	Number of Referrals for School Achievement Problem	Number of Referrals for other Problems	
Immature Boys	36	14	50
Immature Girls	29	21	50
	65	35	100

$X^2 = 2.152$

$df = 1$

$P < 0.20$

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