

SURVEY OF THE RELATIONSHIP
BETWEEN ENTRANCE AGE AND
SUBSEQUENT ACADEMIC SUCCESS

GERI D. S. MOERS

SURVEY OF THE RELATIONSHIP BETWEEN
ENTRANCE AGE AND SUBSEQUENT ACADEMIC SUCCESS

A Research Paper
Presented to
the Graduate Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in Psychology

by
Geri D. S. Moers

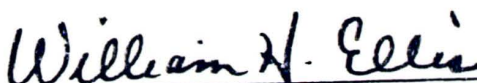
July, 1980

To the Graduate Council:

I am submitting herewith a Research Paper written by Geri D. S. Moers entitled "Survey of the Relationship Between Entrance Age and Subsequent Academic Success." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts in Psychology, with a major in Guidance and Counseling.


Major Professor

Accepted for the
Graduate Council:


Dean of the Graduate School

ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to Dr. Linda Rudolph, Associate Professor of Psychology, for her aid, guidance, and time given during the entire study.

Appreciation is extended to Mrs. Barbara C. Mazzei, Guidance Counselor of Burt Junior High School, and the staff of the school for their valuable assistance in making this study possible.

Gratefulness is extended to Ms. Alice L. Reiss whose deep concern for the success of her kindergarteners initiated the author's interest in this study and also to Mr. Bob Moers for his patience, support and interest.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
The Relevance of School Entrance Age: Review of the Literature	2
Statement of Purpose	15
II. METHOD	16
Subjects	16
Procedure	17
III. RESULTS	18
IV. DISCUSSION	22
REFERENCES	26

LIST OF TABLES

TABLE	PAGE
I. Frequency and Distribution of Birthdays of Regular and Resource Groups	19
II. Subjects' Age at Time of School Entrance . .	19
III. Distribution According to Sex in Resource and Regular Classroom Groups	20
IV. Age at Time of School Entrance for Males Subjects	20
V. Grade Repetition of Total Population in Resource and Regular Classroom	20
VI. Grade Repetition According to Entrance Age of Retained Population of Resource and Regular Group	21

CHAPTER I

INTRODUCTION

The literature reveals that even as early as the 1920's there was concern expressed with regard to success in school as it related to first grade entrance age. The literature shows this concern expressed throughout the subsequent decades, yet state laws reflect little or none of this concern (Moore and Moore, 1979). Numbers of children continue to have academic and social problems throughout their school career, and more and more specialized programs have come into existence each year as attempts to handle these problems. To some authorities, there is a direct relationship between these problems in school and early school entrance (Bigelow, 1934; Hedges, 1977; Moore and Moore, 1979).

Age may not be the primary factor for determining school entrance, but some literature suggests that it is an important factor in indicating a child's success in school. While some authorities found no relationship between entrance age and school success (Green and Simmons, 1962; Hymes, 1964; Braga, 1971; McLeod, Marlowsky, and Leong, 1972), much of the research appears to indicate that perhaps the school systems are asking our children to assume an impossible task: one of competing in a world for which they are not socially, emotionally,

cognitively, or physiologically ready (Otto, 1932; Davis, 1952; Forester, 1955; Carter, 1956; King, 1956; Baer, 1958; Hall, 1960; Meyer, 1961; Brenner and Stott, 1971; Ilg and Ames, 1972; Moore and Moore, 1979). Because the findings concerning the relationship between entrance age and school success are inconsistent, the purpose of the present paper is to further investigate the effects of early school entrance age (defined as any age before six year four months) on subsequent academic success.

The Relevance of School Entrance Age: Review of the Literature

Though there are exceptions, younger children, particularly those who enter school before age six, do not usually achieve as well as older children (Reynolds, 1962; Carroll, 1963; Halliwell, 1966). According to Moore and Moore:

If the children start school later, their teachers will tell you they normally will not become frustrated by their regular school tasks. They will perform easily and readily and are less likely to lose their first excitement of learning. They had an advantage over the early entrants who were handicapped because they had not developed harmonious maturity. (Moore and Moore, 1975, p. 33)

Moore and Moore continue by stating that in the majority

of long-term studies, the later entrant to school has been shown to make significant progress in achievement and other phases of school life over early entrants (1975).

The incident of failure of first graders during the 1920's prompted one researcher to analyze the situation (Otto, 1932). It was Otto's conclusion from his research that children cannot profit from reading instruction until they have reached the mental age of six years, and will profit even more if they do not begin instruction until six years six months.

In the 1930's, another long-range study was conducted in which a group of 88 children who entered first grade at age six was compared with a group of 39 children who entered at between the ages of six years and six years four months (Bigelow, 1934). Scores received on fourth-grade achievement tests were used as the determinant of academic achievement. One of the conclusions drawn by Bigelow was that children having intelligence within the normal range and having attained the chronological age of six years to six years four months upon entering school will have a greater chance of success than children having intelligence within the normal range who enter school at only six years or less. Bigelow does conclude, however, that there are exceptions. Children of less than six years of age do stand a good chance of meeting with academic success, but only if they have reached

a mental age of six years ten months at the time of beginning first grade.

Several authors hold that certain young entrants (less than six years of age) can and do meet with academic success (Terman, 1930; Hobson, 1948; Godfrey, 1954; Miller, 1957). Hobson (1948), in particular, published the results of a ten-year study which concluded that children below the chronological age of six years could achieve academically, but that success occurred only if these children had been carefully screened prior to admittance. A six-month range for testing of underage applicants is recommended by Hobson with a trial admittance for those attaining a mental age of six years two months.

River Edge, New Jersey, was the site of yet another study concerning the relationship between entrance age and future academic success (Davis, 1952). Report card marks for one term of 235 first-grade children in the River Edge Public Schools were compared. Those children whose age was five years nine months to six years three months by October first received 83% of the low grades in math and 55% of the low marks in reading. Children whose ages ranged from six years three months to six years nine months received only 38% of the low marks given in math and 32% of those given in reading. Davis further noted that a similar study (no reference given) conducted with the same subjects as kindergarteners

resulted in an even higher percentage of low grades given to the younger children.

The American Educational Research Association (cited in Davis, 1952) conducted a long-term study of two groups of children matched as to sex, age, and home conditions. One group began reading instruction at age six, the other group began instruction at age seven. Their findings showed that the later beginning group caught up with the early beginning group within two years, and by the end of their seventh year had surpassed the early beginning group by one year in reading level.

A study conducted in the Austin Public Schools compared 50 underage children with 50 normal age children as to academic achievement in grades two through six (Carter, 1956). One group contained children who were six years old or older upon entering school, while the other group was comprised of children who were not yet six years old upon school entrance. Both groups had attended Austin Elementary Schools throughout the elementary grades and were matched according to sex and IQ. T-tests were computed to determine if there was any significant difference in Metropolitan Achievement Test scores, with each sex being compared only with its counterpart in the other group. Carter concluded from his study that "the chronologically older child appears to have the advantage in academic achievement over the

younger child when given the same school experiences. . . and 87% of underage children do not equal the scholastic achievement of normal age children" (1956, pp. 102-103).

King (1956) reported on a study done in the Oak Ridge, Tennessee, School System. Children in this school system may enter school if they will be six years old by December 31. The achievement records of a group of 54 children who entered grade one at ages five years eight months to five years eleven months were compared with the achievement records of a group of children who entered between the ages of six years to six years five months. The IQ's of both groups fell in the 90 to 110 range. After analyzing the data from comments and sixth-grade achievement scores, King concluded that younger entrants are more often repeaters and would be unable to achieve grade level or beyond academic standards.

In 1955, John Forester reported on a 1926 study of 500 kindergarteners which had been done to determine if a relationship existed between chronological age at the time of entrance and a happy and profitable school career. The children were categorized chronologically as "very old" (five years six months or older) to "very young" (below four years six months) and "very bright" (121 IQ or above) to "very dull" (79 IQ or below) mentally. This study revealed that "very bright," "very old" children generally meet with greater success throughout

their school careers, but the "very bright," "very young" meet with mixed success. According to the study, 50% of the bright but young children made only average grades throughout their junior high school years. In consulting teachers as to the possible explanation for these low grades, they reported that these children were physically and emotionally immature. "It is apparent that learning takes place best when there is emotional, physical and social readiness," according to Forester (1955, p. 81).

In still another study, 73 November and December birthday children were matched with 73 January and February birthday children who were in the same grade and had entered kindergarten at the same time (Baer, 1958). The subjects were matched on IQ, sex, and, in most cases, school entered. Cumulative records, marks, and achievement test scores were then compared in their eleventh year of high school. The results of the comparisons indicate that, as a group, the older age children received significantly higher marks in school from kindergarten through grade ten; they scored higher on achievement tests in reading, arithmetic, and social studies; and they maintained grade level promotion more regularly. Baer further points out that though most of the underage children did receive average marks and achievement test scores, the average IQ of both groups was 111.

The 1960's were a decade of a prolific amount of literature concerning entrance age and relative school success (Hall, 1960; Green and Simmons, 1962; Carroll, 1963; Dickinson and Larson, 1963; Ames and Ilg, 1963; Johnston, 1964; Halliwell and Stein, 1964; Hymes, 1964; Halliwell, 1966; Miller and Norris, 1967; Choppin, 1969; etc.). The conclusions drawn by these authors from their reported studies do vary, but a vast majority is in agreement that older age at the time of entrance does facilitate a higher degree of success throughout school.

Several researchers, however, are of the opinion that school success is not directly dependent on school entrance age. Green and Simmons (1962) concluded from a study conducted by Simmons (1958), as well as the results and opinions of other researchers, that it is not entrance age that is the problem, but rather "the mechanical approaches to the problem of individual differences" (Green and Simmons, 1962, p. 46). Hymes (1964), too, is of the opinion that it is not the age of the child that causes children's problems, but rather it is the school setting in which they are placed. Ames and Ilg (1963) indicated that it is neither chronological age nor IQ that indicate school readiness, but rather it is the child's behavioral age. Miller and Norris (1967) stated that school systems should not make their decisions based on statewide studies, but rather

the success with which preceding students have met in the programs adopted by that system. From his review of studies concerning entrance age and relevance of school success in other countries, Choppin (1969) concluded that there is little doubt that age plays a part in achievement in school, but that too little is known to generalize about any correlation between the two variables.

Hall (1960) concluded that if children entered first grade before they were six years six months old, they were three times as likely to be retained at some time during their school career than if they were that particular age or older at the time of entrance. Meyer (1961) pinpoints the correlation further by stating that it is reading that is positively associated with entrance age. She maintains that regardless of ability level, children whose birthdates fall between January and March prior to school entrance will do better in reading achievement than classmates whose birthdates fall after March.

From a study completed by Carroll (1963) in which 29 pairs of children were matched in all aspects except age at time of school entrance, a few months of additional growth appeared to be the only factor which could be used to explain the significantly better progress the older age children made over the younger children. Though Carroll does not specify the age of six years four months as being the minimal age for school entrance, she does question the soundness of children entering first grade

prior to their sixth birthday.

A random sampling was taken of 480 fourth-grade students who had entered the Sioux Falls Public School System at the legal age to see if chronological age had any effect on later school achievement (Dickinson and Larson, 1963). None of the subjects had repeated any grades and IQ was discounted in the composite scores as the mean IQ of the younger group (those children entering school before age six) was higher than the older group (those children entering school six years old or older). Dickinson and Larson concluded from their results that chronological age does significantly affect school achievement as measured by the Iowa Test of Basic Skills.

It is the opinion of Halliwell and Stein (1964) that an earlier date for children entering the first grade is difficult to justify. They base their conclusion partly on the advancement system throughout the school years, but also on the results of a study they conducted using fourth and fifth graders of a suburban Long Island School System. The younger group of each grade was comprised of those children who entered school between the ages of five years eight months and six years three months, while the older group contained children who entered school at ages six years four months through six years nine months. Because the only variable in this study was that of age, the superior performance of

the older group in both grades in reading and reading-related areas indicated the advantage of entering school at six years four months or older.

Halliwell (1966) gave his opinion as to the difference early entry can make in a child's future academic success and questions earlier researchers who concluded entrance age had little to do with subsequent academic success:

A critical analysis of recent reviews on the effects of early entrance to first grade by prominent educators and organizations demonstrated that most of the reviewers relied heavily on the same few sources, and that the findings in these sources were frequently misinterpreted.

Further analysis of the studies in the reviews indicated that pupils who had entered first grade early were one year ahead in grade and approximately three months ahead in average achievement of pupils of similar intelligence and age who had not entered school early; but when early entrants were compared upon anticipated achievement scores with pupils of similar intelligence and grade level, but one year older, it was discovered that the early entrants were approximately seven months behind this criterion group in average achievement. (Halliwell, 1966, p. 395)

The first half of the seventies saw a continued interest among researchers in the relevance of entrance age to school success. It was during this time that several authors became interested in not only first grade and kindergarten age entrance, but the concept of preschool as well, with age at the time of entrance still being of primary concern (Elkind, 1971; Yonemura, 1971; Rohwer, 1971). As had occurred in the 1960's, there continued to be disagreement as to the relationship between entry age and school success.

In a three-year longitudinal study, Hirst (1970) challenged age as a significant predictor for academic success of first and second graders, concluding that other factors played a more important role in determining a child's later success in school. Braga (1971) and McLeod, Markowsky, and Leong (1972) found no significant difference in the academic performance of children entering school earlier from those who entered at the regular age.

Ilg (1972), however, is of the opinion that age is important to school success. From the results of her research, she advocates that instead of a December 31 cut-off birthdate for school entrance, a cut-off date of July 1 or even June 1 would be more effective. Ilg and Ames (1972) maintain that starting children to school at age seven as do the Europeans is a valid action.

Some learning disabilities as well as reading and emotional problems have been attributed to early school entrance (Andreas, 1972). In examining the records of 200 children, Andreas concluded that problems were either created or worsened by forcing children into learning tasks inappropriate for their ages.

It was in the 1970's that Moore (1973) and Moore and Moore (1975, 1979) proposed that even six years or six years six months of age might be too young for school entrance. Three hundred subjects who entered school between two and five years later than the normal entry age of six or seven years were studied by Moore (1973). No evidence could be produced that these subjects had outstanding intelligence, and some could even have been said to be disadvantaged, yet no subject had difficulty in completing elementary school at the customary age or even younger. Moore and Moore (1979) recommend formal schooling not beginning until a child is eight to ten years old.

Several researchers produced articles in the 1970's supportive of later school entrance on the basis of the physiological aspects of a child. These were, of course, not the first articles to appear relating learning to physiological development. Piaget (1952), Elkind (1961), Hilgartner (1962), and Impellizzeri (1967) were among some of the earlier researchers who contended that children

must be maturationally ready for certain tasks before learning could occur.

Hilgartner reported in a letter to Moore and Moore (1975) that in his original studies of 1962, the ratio of far-sighted children was one to five, but that slightly over ten years later he was having difficulty finding any children age ten to twelve with normal vision. This change in the ratio corresponded directly to the lowering of the school entrance age in Texas, and Hilgartner suggests that the use of eyesight in more restricted areas such as schoolwork at an earlier age may have been a factor in the change. Newton, also, completed a study in 1972 with much the same findings as Hilgartner (Moore and Moore, 1975).

Right and left discrimination and lateralization, according to Metcalf (1975) and Elkind (1961), do not take place in a child's brain until approximately eight years old. Moore and Moore (1979) state that other researchers, neurophysiologists, and learning psychologists have also concluded that between eight and ten years of age is the appropriate time at which school tasks should begin due to the physiological development of the child.

Moore and Moore (1979) believe that children cannot make a true success of school until they reach their integrated maturity level (IML). The IML is "the point at which the developmental variables (affective, psychomotor,

perceptual, and cognitive) within the child reach an optimum peak of readiness in maturation and cooperative functioning for out-of-home group learning (typical school experiences" (Moore and Moore, 1979, p. 92). Until IML is reached within the child, structured school learning experiences will result in stress and frustration, neither of which can be said to be conducive to academic success. This "coming together of developmental maturity" (Moore and Moore, 1979, p. 91) does not occur in a child until the ages of eight to ten and sometimes even later. Children of six, then, can hardly be said to be ready to enter school where in they will meet with these structured learning experiences (Moore and Moore, 1975, 1979).

Statement of Purpose

In considering the variable of school entrance age in relation to school success, some literature suggests that children who enter school before they have reached six years four months will not meet with the success that children of at least that age upon entrance will. The purpose of the present study was to further explore the relationship between early school entrance and the academic success of children as they proceed throughout their school experiences.

METHOD

Subjects

The subjects were 33 seventh-grade students enrolled in the resource program and 61 seventh-grade students enrolled in regular classrooms at a junior high school in Clarksville, Tennessee, during the academic year 1979-80. The 33 resource students were selected from a list provided by the resource teacher of all students enrolled in these classes who had average intelligence. Of the 33 resource students, 11 were female and 22 were male. Of those students enrolled in the resource classroom, 22 had never been retained, 10 had been retained at least one grade, and one student's file contained no information concerning retention. The 61 students enrolled in a regular classroom were randomly selected from the school's cumulative records. Of these 61 students, only 53 could actually be used in this study as there was no information as to IQ scores on eight of these students. The 53 randomly selected students enrolled in regular classrooms were also classed as having average intelligence. Of these 53 students, 25 were female and 28 were male. Of those students enrolled in a regular classroom, 49 had never been retained, one had been retained one grade, and four had no information in their files concerning retention.

Procedure

Permission was obtained for the study and data for comparing the 33 resource students with the 53 regular classroom students were taken from the cumulative records of these students. The cumulative folder was examined and a record of the following information was made:

1. The IQ score;
 - a. The Otis-Lennon Mental Ability Tests was used with the regular classroom students.
 - b. The Slossen Intelligence Test or the Wechsler Intelligence Scale for Children was used with the resource students.
2. The student's age of entrance into school;
3. The birthdate of the student;
4. The number of retentions for each student.

CHAPTER III

RESULTS

The results of the present study were as follows:

1. Of the students ($N = 53$) enrolled in the regular classroom, 54.7% had birthdays between November 1 and April 31; 45.3% had birthdays between May 1 and October 31 (the "cut-off date" for Clarksville-Montgomery County School System). Of the students ($N = 33$) enrolled in the resource classroom, 51.5% had birthdays between November 1 and April 31, while 48.5% had birthdays between May 1 and October 31.

2. In an examination of the resource group and the regular classroom group, it was found that 66.7% of the resource group were male and 52.8% of the regular classroom group were male.

3. In further examination of the males within each group, it was discovered that 50% of the males of the resource group had birthdays within the period of May 1 to October 31, while 28.6% of the males of the regular classroom group had birthdays within that same period.

4. Within the resource group, 30.3% of the students ($N = 10$) had been retained at least once and 66.6% ($N = 22$) had never been retained. Within the regular classroom group, 1.9% ($N = 1$) had been retained at least once and 90.6% ($N = 48$) had never been retained. Of the resource students who had been

retained, 60% had birthdays between May 1 and October 31. The one student in the regular classroom group who had been retained also had a birthday between May 1 and October 31.

Table 1
Frequency and Distribution of Birthdays
of Regular and Resource Groups

Month	Regular (N = 53)		Resource (N = 33)	
	Number	Percent	Number	Percent
Nov	5	9.4	3	9.1
Dec	9	16.9	2	6.1
Jan	4	7.5	3	9.1
Feb	4	7.5	5	15.1
Mar	5	9.4	2	6.1
Apr	3	5.7	2	6.1
May	3	5.7	1	3.0
June	2	3.9	2	6.1
July	4	7.5	3	9.1
Aug	3	5.7	5	15.1
Sept	6	11.4	5	15.1
Oct	5	9.4	0	0.0

Table 2
Subjects' Age at Time of School Entrance

Groups	Before age 6-4 years	6-4 years or older
Resource (N = 33)	54.7%	48.5%
Regular (N = 55)	51.4%	45.3%

Table 3
Distribution According to Sex in
Resource and Regular Classroom Groups

Groups	Males	Females
Resource (N = 33)	66.7%	33. %
Regular (N = 53)	52.8%	47.2%

Table 4
Age at Time of School Entrance for Males Subjects

Groups	Before age 6-4 years	6-4 years or older
Resource (N = 22)	50.0%	50.0%
Regular (N = 28)	28.6%	71.4%

Table 5

Grade Repetition According to Entrance Age of
Retained Population of Resource and Regular Group

Groups	Before age 6-4 years	6-4 years or older
Resource (N = 10)	60.0%	40.0%
Regular (N = 1)	100.0%	0.0%

In summary, the percentages were so similar between the resource and regular classroom groups that entrance age appears not to have been an influence on the academic achievement for these particular groups. In comparing the males of the resource and regular classroom groups, a higher percentage (71.4%) of later entering males was found in the regular classroom group. Although 60% of those children who were early entrants had repeated a grade, the results of retention may not be indicative of age as a factor due to the practice of social promotion.

CHAPTER IV

DISCUSSION

The purpose of the present study was to further explore the relationship between early entrance age (defined as earlier than six years four months) and subsequent academic success throughout the elementary school years. An examination of the results indicated that there appears to be no direct relationship between those students who entered school at six years four months and successful academic progress by the seventh grade, nor any direct relationship between those students who entered school before age six years four months and enrollment in a resource class by the seventh grade, or lack of academic success.

Several of the studies involving a large number of subjects, however, indicated that there is a direct relationship between entrance age and subsequent academic success (Bigelow, 1934; Davis, 1952; King, 1956; Forester, 1955; Baer, 1958; Dickinson and Larson, 1963). Other studies indicated that children younger than even six years of age, not the hypothesized six years four months, at the time of school entrance did not meet with the academic success that a six year old entrant did (Reynolds, 1962; Carroll, 1963). Moore and Moore (1979) contend that even seven years of age may be too early for school entrance,

particularly in view of the physiological factors.

In discussion with teachers concerning their observations about those children whom they deemed having academic problems in the classroom, the majority maintained that many children having problems were the younger ones of their age group. These observations have been born out by several noted authorities as previously cited (Otto, 1932; Halliwell and Stein, 1964; Ilg and Ames, 1972; Moore and Moore, 1975; etc.). These teachers further maintained that many younger children have social and emotional maladjustments as well.

When comparing the percentages of those having been retained at least one grade in the resource and regular classroom groups, it was found that only 1.9% (one student) of the regular classroom students had ever been retained, whereas 33.3% of the resource group (11 students) had been retained at least once. There is, furthermore, no way of knowing whether the 66.7% statistic of non-retention is a valid one due to the social promotions which may have occurred. It might also be noted that the one regular student who had been retained and 60% of the resource group who had been retained did enter school at less than six years four months old. King, in her 1956 study completed in Oak Ridge, Tennessee, had reported that younger entrants are more often repeaters.

From examination of the sex variable, it was found that males comprised 66.7% of the resource group and that 50% of this group had birthdays after May 1. Early age entrance did not appear to be a relevant factor for this group; however, other researchers have found the male sex variable to be a significant predictive statistic in connection with entrance age and subsequent academic success, and, perhaps, this bears further investigation (Baer, 1954; King, 1956; Carter, 1956).

From the results of this study, it does not appear that age at the time of entrance is in itself an important variable for subsequent academic success. Future studies might explore the predictive value of entrance age in combination with other variable such as sex, order of birth, or a specific type of school program (Green and Simmons, 1962; Hymes, 1964; Miller and Norris, 1967). This study, also, did not concern itself with the extent of assessment the children received before school entrance. This factor, too, may have a relationship with school entrance as suggested by Bigelow (1934) and Hobson (1948).

In the early sixties, Ames and Ilg (1963) indicated from their findings that behavioral age of children is perhaps the predictive factor in determining their success in school. More recently, Moore and Moore (1975, 1979) researched the relationship between successful school

experiences and children's integrated maturity level (IML). Both these aspects bear further investigation in relation to academic success in school.

The present study concerned itself with a small segment of a population from a predominantly low socio-economic status (SES). It is possible, therefore, that the SES factor had bearing on the findings, and that this variable, too, should be considered in investigating the relationship between entrance age and subsequent academic success.

REFERENCES

- Ames, L. B. & Ilg, F. L. Every child in the right grade: Behavior age rather than age in years the best clue to correct grade placement. The Instructor, 1963, 73, 7 & 111.
- Andreas, V. J. School Entrance Ages and Subsequent Progress. Master's thesis, University of Northern Colorado, Greeley, Colorado, 1972.
- Baer, C. J. The school progress and social adjustment of underage and overage students. Journal of Educational Psychology, 1958, 49, 17-19.
- Bigelow, E. School progress of underage children. Elementary School Journal, 1934, 35, 186-192.
- Braga, J. L. Early admission: Opinion verses evidence. Elementary School Journal, 1971, 63, 103-6.
- Brenner, A. & Stott, L. H. School Readiness Factor Analyzed. Detroit: The Merrill-Palmer Institute, 1971.
- Carroll, M. L. Academic achievement and adjustment of underage and overage third graders. Journal of Educational Research, 1963, 56, 415-419.
- Carter, L. B. The effect of early school entrance on the scholastic achievement of elementary school children in the Austin Public Schools. Journal of Educational Research, 1956, 50, 91-103.

- Choppin, B. H. The relationship between achievement and age. Journal of Educational Research, 1969, 12, 22-9.
- Davis, H. M. Don't push your school beginners. Parents Magazine, 1952, 27, 140-1.
- Dickinson, D. J. & Larson, J. D. The effects of chronological age in months on school achievement. Journal of Educational Research, 1963, 56, 492-93.
- Elkind, D. Children's conception of right and left: Praget replication study IV. Journal of Genetic Psychology, 1961, 99, 269-76.
- Elkind, D. Early childhood education: A Piagetian perspective. The National Elementary Principal, 1971, 51, 48-55.
- Forester, J. J. At what age should a child start school? The School Executive, 1955, 74, 80-81.
- Godrey, S. E. School entrance age in relation to promotion and non-promotion. Toledo, Ohio: Board of Education, 1954.
- Green, D. R. & Simmons, S. V. Chronological age and school entrance. Elementary School Journal, 1962, 63, 41-47.
- Hall, Robert V. A study of boys and girls in the Highline School District, King County, Washington, to determine the relationship of chronological age at the time of school entrance to academic success as measured by retentions, and by tests of achievement given to

pupils at grades three and six. Unpublished masters thesis, University of Washington, 1960.

Halliwell, J. W. Reviewing the reviews on entrance age and school success. Journal of Educational Research, 1966, 59, 395-401.

Halliwell, J. W. & Stein, B. W. A comparison of the achievement of early and late school starters in reading related and non-reading related areas in fourth and fifth grades. Elementary English, 1964, 41, 631-639.

Hedges, William. At what age should children enter first grade? University Microfilms International, 1977.

Hilgartner, J. The frequency of myopia found in individuals under 21 years of age. Unpublished manuscript, Austin, Texas (first reported by Mosdle Bolaud), 1962.

Hirst, W. E. Entrance age: A prediction variable for academic success? Reading Teacher, 1970, 547-555.

Hobson, James R. Mental age as a workable criterion for school admission. Elementary School Journal, 1948, 312-21.

Hymes, J. L., Jr. The right school-starting age. Grade Teacher, 1964, 17, 123-124.

Ilg, F. L. Overplacement - the problem that doesn't have to be. Teacher, 1972, 90, 16 & 25.

- Ilg, F. L. & Ames, L. B. School Readiness: Behavior Tests Used at the Gesell Institute. New York: Harper and Row, 1972.
- Impellizzeri, I. H. Auditory perceptual ability of normal children aged five through eight. Journal of Genetic Psychology, 1967, 111, 289-94.
- Johnston, A. M. School entrance age. Childhood Education, 1964, 40, 384-386.
- King, I. B. Effect of age of entrance into grade 1 upon achievement in elementary school. Elementary School Journal, 1956, 331-336.
- McLeod, J; Markowsky, M. D.; & Leong, C. K. A follow-up of early entrants to elementary school. Elementary School Journal, 1972, 73, 10-19.
- Metcalf, D. R. An investigation of cerebral lateral functioning and the EEG Report of a study made for the U. S. Office of Economic Opportunity, under Research Grant No. 50079-G-73-02-1, Barrien Springs, Michigan: Hewitt Research Foundation, 1975 (ERIC No. pending).
- Meyer, Charlotte. At what age should a child enter school? Illinois Educator, 1961, 50, 67-70.
- Miller, V. V. Academic achievement and social adjustments of children young for their grade placement. Elementary School Journal, 1957, 257-63.

- Miller, W. D. & Norris, R. C. Entrance age and school success. Journal of School Psychology, 1967, 6, 47-60.
- Moore, R. S. Unpublished school entry-age reports on file at Hewitt Research Foundation, Berrien Springs, Michigan, 1973.
- Moore, R. S. & Moore, D. H. Better Late Than Early, New York: Reader's Digest Press, 1975.
- Moore, R. S. & Moore, D. H. School Can Wait, Provo, Utah: Brigham Young University Press, 1979.
- Otto, H. J. Implications for administrations and teaching growing out of pupil failures in first grade. Elementary School Journal, 1932, 33, 25-32.
- Piaget, J. The Origins of Intelligence in Children. (M. Cook, trans.) New York: International Universities Press, 1952.
- Reynolds, M. C. (ed.) Early School Admission for Mentally Advanced Children: A Review of Research and Practice. Washington, D. C.: Council for Exceptional Children, 1962.
- Rohwer, W. D. Prime time for education: Early childhood or adolescence? Harvard Educational Review, 1971, 41, 316-341.
- Simmons, S. V. A study of the chronological age of children in relation to their achievement in school. Unpublished paper, Emory University, 1958.

Terman, L. W. (ed.) Genetic Studies of Genius, Follow-Up
Studies of a Thousand Gifted Children. Vol. III,
Stanford, California: Stanford University Press,
1930.

Yonemura, M. The rights of young children. The National
Elementary Principal, 1971, 51, 56-63.