THE EFFECTS OF SCHOOL ENTRANCE AGE ON READING ACHIEVEMENT
AT THE EIGHTH GRADE LEVEL

MASTER’S PROJECT

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by

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Reader

Reader
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CHAPTER I
INTRODUCTION

The age at which students formally begin their education raises many questions for both parents and educators. Younger five-year olds are thought to have more problems with academics and social adaptations if they enter school with the older five-year olds (Reese 1997), especially when student comparisons and competency testing is becoming increasingly important. Across the United States the entrance age varies according to the policies and procedures of many school districts. Some districts use readiness tests while others only use age as an eligibility criteria for allowing children to enter kindergarten (Reese). Issues of being too much older than other classmates for an old child or too immature or not ready for a younger child are raised by both parents and educators who want to know how these decisions will affect the child later on during his or her academic career.

Educators have an age cut-off date to determine whether a child is eligible for kindergarten entrance. Although it varies from state to state, the entrance age cut-off date for Ohio is September 30. Children must turn five years old on or before this date in order to be eligible for kindergarten entrance in September. There are educators who believe that this date should be changed. Ohio House Bill #380, proposed by Ohio Rep. Charles Brading, R – Wapakoneta to allow the schools to change the cut-off date to June 1, was heard in the Ohio House Education Committee during July 1997 (Editor, Troy Daily News, 1997). Findlay third grade teacher Joan Angle led this attempt at legislation, because she believes that children who have summer birth dates and enter kindergarten...
when they are five years old are more stressed, have lesser attentions spans and are usually retained in kindergarten for another year. At the printing of this thesis, the bill was still sitting in the House and had been heard twice.

In Ohio, because of the September 30 cut-off date for kindergarten entrance, the summer children or summer birth date children are those children who are born during June, July, August, and September. These children, if they enter kindergarten when they are eligible, are the young five-year olds. If these children do not enter kindergarten until a year later, they are the older students who are a year or more older than the five-year olds of their grade level.

According to Bracey (1989), “red shirting” has become a common practice among upper-middle class parents of children who have late birth dates. “Red shirting” occurs when parents hold their child out of kindergarten for one year to mature and to be the among the oldest in the class. Bracey points out that some middle – lower income parents will send their children to school because they will not have the worry of childcare. A study by Bellisimo, Sacks, and Mergendoller (1995) appears to show that boys are more often held out of kindergarten for one year than are girls. Their findings reported that boys were held out 47% more often than girls in 1988 and 31% more often than girls in 1991. They attributed the decline to loss of access to pre-kindergarten classes in some of the schools. Bredekamp and Shepard (1989) note that since the expansion of pre-kindergarten services in many public school systems and the increased need for childcare for children of working parents, the trend has been that kindergarten and preschool curriculum has become academically higher. They state that “high stakes testing is now the reality in primary schools” (p.14). With all of the older children in the...
kindergarten classroom, materials from first grade are often used in the kindergarten level which is not easily handled by the younger children and sets them at-risk for failure (Bracey, 1989 and Uphoff & Gilmore, 1986).

Children who fail kindergarten can be retained or held back to repeat kindergarten for another year or placed in a type of pre-first grade class. When any form of retention occurs, it raises the issue of how the retention year will affect the child. Because it would seem that parents and educators would want to avoid having a child retained in a grade, the issue of school readiness, which is when a child is ready to handle the demands of school participation, is raised.

Meisels (1987) notes that the many developmental kindergartens in the country have a high number of students who have birthdays close to the cut off dates. Developmental kindergartens are a type of pre-kindergarten class for students who were not deemed ready for regular kindergarten. Meisels states that “changing the standard of school readiness or the entry age cutoff only changes the composition of the group that is youngest or least ready – it does not eliminate it” (p.72). Meisels says that it appears that much of the current testing trend comes from the demands on kindergarten teachers to teach more academics in their classes in order to have students ready for the high pressures of the primary grade levels.

**Statement of Purpose**

Ultimately, parents and educators should have information about how entrance age affects later achievement, especially reading. The research literature shows few studies of entrance age and later reading achievement. How well a student is able to read and comprehend written material could possibly affect how he or she achieves later in
life. The purpose of this study is to examine school entrance age and its effect on the reading achievement of males and females at the eighth grade level of two small school districts in west-central Ohio.

Assumptions

It is assumed that there is no difference between the different school systems even though curriculum may not have been exactly alike, and teaching styles may have varied.

Delimitations

While students who were labeled as exceptional were removed from this study, gifted students were not. Although enrichment activities were offered for students who display gifted tendencies, neither school district from which the data was gathered, had a gifted program in place for the truly gifted students. In addition, students that were retained may have a pattern of being young five-year olds upon kindergarten entrance or of being identified as exceptional at a later date. Finally, the controlling variable IQ was not used in the equation of this particular study because such a consideration could not be considered.

Hypothesis

It is hypothesized that students who entered school as young five-year olds will score significantly lower on reading achievement tests than the older students in the same grade level, especially among the male gender.
CHAPTER II
REVIEW OF LITERATURE

In view of the issues of school readiness, school entrance age, "red shirting," (Bracey, 1989) and retention effects on children, the literature is varied. Bredekamp and Shepard (1990) say that raising the school entrance age and holding younger five-year olds out of school for one year are not appropriate practices for children. They believe that educators should take responsibility for individualizing, adapting, and providing the best instruction possible as needed in each situation. They also suggest getting away from practices of using standardized tests as the basis for allowing a student to enter school or advance to the next grade level. Bredekamp and Shepard emphasize the use of alternative assessment for evaluation of students' progress such as portfolios, documentation of student performances, and systematic observations of students.

It could be that the debate is whether school entrance age or developmental age indicates later reading achievement. Wood, Powell, & Knight (1984) favor developmental level as the indicator of later achievement. They researched the validity of the Gesell School Readiness Screening Test that was developed by Ilg and Ames in 1965 and revised in 1978. It is one of the most widely used screening devices for kindergarten and first grade screening (Wood et al., 1984). They found that the developmental age as indicated by the Gesell Screening Test is a fair indicator of later readiness, not the chronological age upon which many educational systems rely.

Meisels (1987) and Bredekamp and Shepard (1989) disagree with what they consider is the improper use of screening/readiness tests for placement decisions of
children who are eligible to enter school. They all point out that the use of developmental screening tests which are for assessing skills that are closely linked with school success in the future, must be highly reliable and valid. Likewise, Meisels and Bredekamp and Shepard point out that The Gesell School Readiness Screening Test (Ilg & Ames, 1972) and The Gesell School Readiness Test (Ilg and Ames, 1965, 1978) does not have the proven reliability and validity statistics needed to be a test for predicting the placement of children. Meisels differs from Ilg and Ames when he states that The Gesell, as a readiness test and used as a basis for planning curriculum and instruction, would be a sound device. On the other hand, Kaufman and Kaufman (1972) note that The Gesell incorrectly labeled 1/3 to 1/2 of the children as not ready for school. In addition, The Metropolitan Readiness Test [MRT] is noted by Nurss and McGauvran (1986) as having incorrectly identified students that were unready for school 1/3 of the time.

In keeping with the National Association for the Education of Young Children’s [NAEYC] Position Statement on Standardized Testing of Young Children 3 Through 8 Years (NAEYC, 1988), Pellegrini and Glickman (1990) examined the issue of measuring kindergarten’s social competence in combination with behavioral measures, peer nomination, teacher ratings, and standardized tests. In their two year study of 35 children of middle to lower socioeconomic status in kindergarten and then in first grade, they used a combination of assessments. Teachers used the MRT in kindergarten and the Georgia Criterion-Referenced Test in first grade (Pellegrini & Glickman). Pellegrini and Glickman also used teacher rated personality assessments, playground behavior observations, and peer-nominated sociometric status assessments. Only 36% of the students’ first grade achievement was indicated by the MRT in kindergarten. When
Pellegrini and Glickman included the other assessments with the MRT, they were able to indicate 75% achievement.

Uphoff and Gilmore (1986) explore the issue that children with summer birth dates are “unready” for school, deal with too difficult of curriculum, and lack success in later life. In their book *Summer Children*, Uphoff, Gilmore, & Huber (1986), examined all of the youth suicides of Montgomery County, Ohio under the ages of twenty-five for 1983 – 1984. Of all the male youth suicides, 45% were children whose birth dates were during the summer months. Even more interesting was that of all female youth suicides, 83% were summer children.

In a study by Zill, Collins, West and Hausken (1995), the parents of 4,423 preschool children ages 3 to 5 years were surveyed about their child’s accomplishments and difficulties. The results were compared to five family risk factors: the mother’s level of education, the family’s financial status, the mother’s primary language, the mother’s marital status at the time of the child’s birth, and the number of parents present in the home. Zill et al. (1995) found that “half of today’s preschoolers are affected by at least one of these risk factors, and 15% are affected by three or more of them” (p.3). They were able to document more difficulties and lower emergent literacy skills to preschoolers who were affected by one or more of these factors such as a mother without a high school diploma or the family living below the poverty level. Zill et al. concluded that a strong need exists for early preschool intervention in order to meet the needs of these at-risk preschoolers from low socioeconomic backgrounds.

Many kindergarten students who are deemed unready to go to the first grade level are held back in kindergarten or placed in a pre-first grade class, often referred to as a
transition class (Wang & Johnstone, 1997). The purpose for the transition class is to allow the student to become ready for first grade thus avoiding failures in the future. Wang and Johnstone studied a pre-first grade program with four studies. The first part of the study examined the participants, while the other three parts of the studies examined the retention rate and special education placements of the same students over five different cohort years for three or four years consecutively. The examination of the participants yielded interesting results among the students’ birth month and their placement after kindergarten. There was a higher rate of students placed in the pre-first grade who had birthdays later in the qualifying year than students who had birthdays during the middle or earlier part of the year, suggesting that younger students are judged as not ready for first grade. (Wang & Johnstone). The second part of the study by Wang and Johnstone found that students who were placed in the pre-first grade class had a higher rate of being placed in special education. Another study of these students who were recommended for pre-first grade, but did not participate and the same age students who were deemed ready for first grade, yielded a higher retention rate at the end of first grade than those students who had been judged ready to go on to first grade without a transition year (Wang & Johnstone). Considering student achievement scores in all of the different studies, the students who received the transition year class did not perform any better than the non-participating students who were recommended for the transition year (Wang & Johnston).

The same achievement results were reported by Shepard and Smith (1987) in their study of kindergarten retention and later achievement at the end of the first grade. They
found that in reading achievement, students who were retained in kindergarten had only achieved a month higher than they would have if they had not repeated kindergarten.

Langer, Kalk and Searls (1984) researched achievement trends in relation to entrance age. Part of their study looked at the retention rates of Caucasians and African Americans from four years old through seventeen years old. Their data indicated that both Caucasians and African Americans have a higher rate of retention as “the relative age in the classroom becomes younger” (p.63). This statistic is noted all through the age levels, but at age seventeen, it is not noted. The researchers attribute the reason for this disappearance to drop out rates, or the fact that with maturity comes the ability to handle problems differently.

Yet the inquiry into school entry age and academic achievement goes on. Parents and teachers continue to hold students out of kindergarten for one year in spite of the guidelines set forth by the NAEYC’s Revised Position Statement on Developmentally Appropriate Practice in Early Childhood Program (Bredekamp, 1997). Where curriculum is concerned, the stress is on using a “rich curriculum content . . . that is meaningful and accessible to young children” (Bredekamp, p.38). The push to use standardized test scores to judge student readiness to enter school or to be promoted to the next grade contributes to the raising of academic curriculum in the lower grades (Bredekamp). This in turn affects the issues of the appropriate school entry age for children entering kindergarten.

Studies of students’ academic achievement in relation to their school entrance age yield different results. Sweetland & De Simone’s 1987 study included 152 sixth grade children of a population of 700. Those in the study had lived in the same district for all
of their elementary years; therefore, data was available from the Comprehensive Test
of Basic Skills (CTBS) for each of their grade levels. The children were grouped into
four quarter groups according to their birth dates. Overall results showed that the
younger quarter groups did not score as high as their older peers in grades one through
four. In particular, the reading scores for each grade level were lower for the lowest birth
quarter.

Crosser (1991) compared fifth and sixth grade students of the same age but
different grades because some entered school as a young five-year old and others entered
as six-year olds. The students in the fifth grade were matched with the students in the
sixth grade by gender and intelligence resulting in forty-five pairs. They were given
achievement tests, and the scores of each student were compared to his or her younger or
older matched student. Older males scored higher than did the younger males, and older
females also scored higher than the younger females. On the reading portions of the
achievement tests the older males and older females had substantially higher score
differences over their younger male and female counterparts. Gender differences were
not noted in this study; however, in Crosser’s study, boys were noted to have more
pronounced lower scores than girls.

Reading readiness achievement was addressed by Parks (1996) on thirty of fifty-
six African American kindergarten students from Chicago. Parks found that the younger
birth date students tended to score lower on readiness tests than those students who were
older. It should also be noted that the age range of these students was 5 years 5 months to
6 years 5 months (Parks). The summer birth dates were not a part of this study or they
did not show up in the random sampling of the population of 56. In the three studies,
(Crosser 1991, Sweetland & De Simone 1987, and Parks 1996), younger children yield overall lower academic scores as compared to their peers.

It has also been noted by different researchers that the lower achievement relative to younger ages diminishes over time (Sweetland & De Simone 1987, May & Welch 1986, and Kinard & Reinherz 1986). These findings indicated that the lower achievement is noticeable in the early grades of school, but by the time the younger students reach the late elementary grades, the difference in achievement does not exist. (Sweetland & De Simone 1987, May & Welch 1986, and Kinard & Reinherz 1986).

In Sweetland & De Simone’s (1987) study mentioned earlier, a definite trend was observed in lower scores from younger students as they advanced from grades one through four. By the time these students reached fifth and sixth grade the difference in overall academic achievement was no longer as noticeable, suggesting that the students “catch up” to their peers’ level. It should be noted, however, that reading scores in grades two through six for the youngest birth quarter of children were significantly lower than that of the other three birth quarters (Sweetland & De Simone).

Kinard and Reinherz (1986) followed 488 predominantly white students through their fourth grade year. At school entrance, the students were screened for information processing ability. It was noted at that time that the youngest age group had lower processing abilities than did the older group. When tested in the fourth grade on achievement tests, these same students showed no difference in achievement scores.

May and Welch (1986) studied 152 sixth grade students, divided into birth date groups by quarters, who were screened at kindergarten and again one year later in first grade with the same Gesell Screening Tests (Gesell, 1980). At the kindergarten
screening there were significant differences between all of the birth date groups. One year later, there were significant differences between two groups only. When the same students were administered the Stanford Achievement Test [SAT] in second and fourth grades, there were no differences in scores relative to the birth date groups. The reading scores were not perceived differently from the other academic areas. Again, the literature points toward a "growing-out" of the lower achievement bracket by the young age child.

Some studies, however, tend to show that entrance age has no effect on achievement (Dietz & Wilson 1985, Bickel, Zigmond & Strayhorn 1991, and Magliacano, 1994). Dietz and Wilson examined kindergarten children for readiness and assessed them again at second and fourth grades using standardized achievement test scores. Results showed no significant differences between the different birth date groups. There was one noted gender difference in the reading composite at second grade in which boys scored six months lower than girls.

Another first through fourth grade study by Bickel, Zigmond and Strayhorn (1991) found similar results to Dietz and Wilson (1985). There were no achievement differences noted as to entrance age of the child except for a slight variance in the math portion of the first grade testing (Bickel, Zigmond & Strayhorn).

Magliacano (1994) conducted reading readiness tests with Kindergarten students and achievement testing with the same students one year later in first grade. She found no significant difference when comparing the mean scores between the younger and older students.

Quinlan (1996) studied reading achievement scores of third grade students and found that while there was a higher achievement among most of the older subjects than
the younger subjects, the $t$ of the comparisons found the comparisons not to be significant. Quinlan (1996) also found no significant difference between the reading achievement scores of boys and girls.

There is mixed information from the research studies that have been done. Studies that indicate that there is no effect on reading achievement based on the entrance age of school are Parks, 1996, Crosser, 1991, and Sweetland & De Simone, 1987; studies that indicate that as students progress through the elementary grades, the effect of entrance age on reading achievement disappears are May & Welch, 1986, Sweetland & De Simone, 1987, and Kinard & Reinherz, 1986; and studies that indicate that entrance age has no effect at all on reading achievement are Dietz & Wilson, 1985, Bickel, Zigmond & Strayhorn, 1991, Magliacano, 1994 and Quinlan, 1996.

Another factor to consider is, as these studies are designed, most have used subjects that have been in regular education classes only, which omits students who have been retained or placed into special education services (Crosser 1991, Sweetland & De Simone 1987, May & Welch 1986). It would be beneficial to study all special education students and their entrance age at kindergarten.

There are some studies which discuss student retention rate or placement into special education services. Kinard and Reinherz (1986) reported these statistics from their study of 488 children. Nine % by the fourth grade had been retained and 1.8% had been identified as needing special education services. Bickel, Zigmond, and Strayhorn (1991) identified 14 % of their 220 subjects as being retained one time, 5% were special education students, and 26% after grade one needed Chapter One services. They also note based on statistics that in this population (an urban setting), 8 to 23% should expect
to be retained at least one time by the time they reach fifth grade. What is not known is the ages of these students who were out of the regular education class.

While looking at the research cited, we may note that very little research is found about reading or general academic achievement for grades seven or older among females and males. Neither parents nor educators can be advised about the entrance of a child into school if nearly nothing is known about entrance age in relation to the reading achievements of students in later grades. It is generally known in the special education field that students with low reading abilities tend to cope but fall a little more behind in reading as each grade progresses. By the time the student reaches the junior high years, the material has become so much more difficult that the student, having reached an academic plateau, is not able to handle the level of difficult reading, and therefore ends up being tested for special education services (Bender, 1995).

Considering all of these factors one must recognize the need to have more research on the effect of entrance age on later reading achievement. Therefore, the purpose of this study is to determine if school entrance age has an effect on reading achievement of females and males at the eighth grade level.
CHAPTER III
METHODOLOGY

The subjects for this study were drawn from two small town school districts in west-central Ohio. In order to obtain the highest number of subjects possible, all of the students that were in the eighth grade during the 1997 – 1998 school year and who entered kindergarten during the fall of 1989 were used in the sample. A final count of ninety-seven subjects resulted from the original number of one hundred twenty-eight. This number was determined by taking the one hundred and twenty-eight students combined from both schools and deducting the twelve students that receive special education services and the eighteen students who entered kindergarten in 1988. Also omitted from the sample were four students who had insufficient information of data. While these students were not used in the study, their numbers and pertinent information are included in the discussion section of this research.

Because of the issues concerning the wisdom of keeping the younger five-year olds who have June, July, August and September birth dates out of kindergarten for a another year, the students were divided into four levels according to their birth dates. For ease in discussion the groups will sometimes be referred to as Group 1, Group 2, Group 3 and Group 4. The oldest group (Group 1) consists of those students who were eligible to enter kindergarten in 1988 but did not enter until the fall of 1989. The second group (Group 2) consists of students with birth dates of October 1983 through January 1984. The third group (Group 3) has students with birth dates of February 1984 through May
1984, and the younger group (Group 4) has students with birth dates of June 1984 through September 1984. Each birth date group was again divided into male and female groups resulting in a total of 8 groups.

The data collected was the reading scores from the Ninth Grade Ohio Proficiency Test which was given in March of 1998 to the eighth grade students. Overall, the data was examined to see if there is any effect on the scores between the different birth date groups and their entrance date into school. It is important to note that Ohio students must score 200 and above to pass the test. At this testing date the maximum number of possible points was 283. Student scores are based on the number of questions that were answered correctly. Each question was worth the same number of points; therefore, not all scores will be seen in the data to be collected.

The design of this study consists of two independent variables and one dependent variable. The independent variables are the four birth date groups and the gender group. These groups are independent groups since the students cannot be in more than one group at the same time. The dependent variable in this design is the 8th grade reading scores from the 9th Grade Ohio Proficiency Test that was given during March 1998.

The data was statistically analyzed using a Single Factor Analysis of Variance (ANOVA) on all of the scores and a t-test on the genders of each birth date group. Histograms showing the frequency distribution of scores, scatter plots of entrance age in comparison to scores, box plots using the range and median scores of each birth date group, and a line graph of the group mean scores were compiled for visual examination of the different birth date groups. The older group of students who were six years old were visually compared to all of the five-year olds using a generated graphic consisting
of two bar graphs, two bell curves, and two box plots to depict membership configuration of the sample. It was hoped that results would help determine if there is any correlation between the age at which the students entered school and his or her reading achievement at the eighth grade level. The results and summary chapters also examine the number of students who were not used in the data to see if there is any indication of entrance age corresponding to retention, or to those who were identified as receiving special education services. These are all important factors to consider for a better understanding when making statements about the effect of entrance age upon eighth grade reading achievement.
CHAPTER IV

RESULTS

Of the 97 subjects in the study, 32 were in Group 1 with 18 males and 14 females. In Group 2 there were 29 subjects. Seventeen were males and 12 were females. Group 3 consisted of 23 subjects. Seven were males and 16 were females. In Group 4 there were 13 subjects. Four subjects were males and 9 were females. When combined, there were 46 males and 51 females.

An Analysis of Variance (ANOVA) performed on the scores of the four groups yielded no significant difference detected among the four groups. When a $t$-test was used to compare male scores with female scores, the older male group (Group 1) scored significantly higher but only when a one-tailed $t$-test was administered (see Table 1). Interestingly, the direction (i.e., superiority of male reading scores over female reading scores) would not be the expected direction. Thus, these results may be worthy of further investigation.

The scatter plot for all subjects yielded tight distribution among male and female reading scores (see Figure 1). In comparing the scatter plots for each birth date group, scores remain tight in each group except for Group 4, the youngest group. The distribution of scores for Group 4 were much closer together and lower (see Figures 2 through 5). Lower membership numbers for Group 4 perhaps tended to exacerbate this apparent distribution difference. A difference in the scales used on the horizontal axis makes visual comparisons difficult.
The Histogram of all subjects combined yielded ranges from 180 to 283 (see Figures 6 through 8). Those of the older students show more scores on the higher range portion of the chart, especially when examining the male chart (see Figure 9 and 11). The females in Group 2 display a wider range of scores from 205 – 283 than the males of the same group who have scores mainly ranging from 205 – 245 (see Figure 13 and 14). The Group 3 range of scores spread from 190 – 283 (see Figures 15 through 17). In Figures 18 through 20, the scores of females are centered in the middle of the range while the males are spread from 200 to 283.

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<td><strong>t Critical two-tail</strong></td>
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Figure 1

**All subjects in study**

- 8th grade reading scores vs. 9th grade Ohio Prof. Test
- Entrance age in months
- Females vs. Males

---

Figure 2

**Group 1**

- 8th grade reading scores vs. 9th grade Ohio Prof. Test
- Entrance age in months
- Females vs. Males

---

Figure 3

**Group 2**

- 8th grade reading scores vs. 9th grade Ohio Prof. Test
- Entrance age in months
- Females vs. Males
Figure 4

Group 3

![Scatter plot showing 8th grade reading scores on 9th grade Ohio Proficiency Test for Group 3.](scatter_plot_3)

- Females
- Males

entrance age in months

Figure 5

Group 4

![Scatter plot showing 8th grade reading scores on 9th grade Ohio Proficiency Test for Group 4.](scatter_plot_4)

- Females
- Males

entrance age in months

Figure 6

Histogram

All subjects

![Histogram showing 8th grade reading scores on 9th grade Ohio Proficiency Test for all subjects.](histogram)

8th grade reading scores on 9th grade Ohio Proficiency Test
Figure 10

Histogram
Females: Group 1

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 11

Histogram
Males: Group 1

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 12

Histogram
All students: Group 2

8th grade reading scores on 9th grade Ohio Proficiency Test
Figure 13

Histogram
Females: Group 2

8th grade scores on
9th grade Ohio Proficiency Tests

Figure 14

Histogram
Males: Group 2

8th grade scores on
9th grade Ohio Proficiency Test

Figure 15

Histogram
All students: Group 3

8th grade reading scores on
9th grade Ohio Proficiency Test
Figure 16

Histogram
Females: Group 3

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 17

Histogram
Males: Group 3

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 18

Histogram
All students: Group 4

8th grade reading scores on 9th grade Ohio Proficiency Test
Figure 19

Histogram
Females: Group 4

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 20

Histogram
Males: Group 4

8th grade reading scores on 9th grade Ohio Proficiency Test
Upon examination of the line graph of the mean scores of each birth date group, Group 1 has a higher mean score of 241.6 than the other groups of 230.6, 237.5, & 233 respectively (see Figure 21).

The box plots used in Figure 22 are interesting for side-by-side comparison of the distribution of the four birth date groups (Agresti & Finlay, 1997). These box plots are a visual summarization of the typical scores within the sample groups and the difference in ranges of scores. The central tendencies of Group 2, Group 3, and Group 4 have exactly the same score (228). The median score for Group 4, the older students, was 243. These differences between older and younger students appear substantial but not statistically significant. Group 3 has a definite positive skewness to the right of the distribution, since the upper whisker and the upper half of the central box are longer than the lower ones. Oppositely, Group 1 has a negative skewness to the left of the distribution because its lower whisker and lower half of the central box are longer. Group 4 has the smallest range of central tendency (approximately 220 –240) and the smallest range of overall scores (approximately 210-245) except for the high performing outlier to the right of the distribution. This outlier falls at least 1.5 inter quartile range (Agresti and Finlay, 1997) above the upper quartile. This outlier is shown separately from the rest of the distribution because it supplies little information in regards to the rest of the distribution. The overall visual range of Groups 1, 2, and 3 scores are distributed from approximately 180 to 283. While the examinations based on central tendencies (median and mean) yield no statistical differences among the groups, when one studies the distributions on the graphic charts, differences appear clearly evident.
The six-year old – five-year old contrast graphic in Figure 23 yields a bell curve distribution on the five year old side. The six year old data has two distributions within the curve. The higher of the two bell-shaped distributions belongs to the children that entered school at age 6. A second cluster (see Figure 23) of low functioning readers is also clearly visible. No statistically significant differences ($t_{obt} = 1.293, df = 49.3, p = .202$) were detected. Nevertheless, even though no claims can be made, such findings will only be found due to chance alone only 1 out of 5 times.

The frequency histogram charts in Figures 24 through 28 display a side by side comparison of the male and female scores in three various ranges. The first range of scores on the x-axis are the scores up to 200. The next range are those scores that spread from 201 to 250, and the last range are those scores up to 283. All scores fell between 150 and 300. Figure 25 of Group 1 contains a higher number of subjects, especially males scoring in the higher range as compared to the number scoring in the middle range. The other graphs display a larger number of subjects scoring in the middle range as compared to the higher range. When examining the bell-shaped spread of scores in Figures 23 and 24, it appears that most of the scores fall into the middle range.

There were 19 students not included in the study because they had entered kindergarten in 1988 or had been retained after that year. There were 9 females and 10 males in this group. Five of the females and 2 of the males had birthdays during the summer months. Seven of the nine females scored 200 to 250 on their proficiency test and 7 of the 10 males scored 200 or higher. The two summer birth date males scored 245 and 283 (see Appendix p.38).
While the students who received special education services were not included in the different statistical tests, their data is considered as well. Of the 12 subjects in this group, 8 were males and 4 were females. Only 4 subjects had repeated kindergarten and 6 of the 12 had entered as 6 year-olds. Five of the 12 scored high enough on their proficiency test to pass the state standards (see Appendix p.38).
Figure 21

Group Mean Scores
Figure 23

Graphical Contrasts
Six Year Olds - Five Year Olds

Score

Age Group

6 Year Olds
5 Year Olds
Figure 24

**Frequency of scores for all students**

Females  □  Males ■

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 25

**Frequency of scores for Group 1**

Females  □  Males ■

8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 26

**Frequency of scores for Group 2**

Females  □  Males ■

8th grade reading scores on 9th grade Ohio Proficiency Test
Figure 27

Frequency of scores for Group 3

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8th grade reading scores on 9th grade Ohio Proficiency Test

Figure 28

Frequency of scores for Group 4

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8th grade reading scores on 9th grade Ohio Proficiency Test
CHAPTER V
SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

Although statistically significant differences among these students could not be detected, this study has several interesting items to be considered. If the results are examined by statistic scores only, there are not many claims to be made. When the data are visually examined using graphics, however, the findings are interesting to note. When examining the six-year old and five-year contrast graphic (see Figure 23), it is noted that there are two distributions among older students. The smaller of the distributions represents a very small number of low achieving students that remain on-track to graduate, have not qualified for special education services, and have never failed a grade level. Nevertheless, they form a distribution unique unto themselves. They also suppress the older groups' higher scores. The males in this group were scoring considerably higher than the females (see Figure 28). The statistical data shows only a 0.202 probability, however, the older students are nearly five-times more likely to do better. Still, the data do not exhibit a statistically significant difference. Likewise, when one examines the mean line graph of each birth date group in Figure 26 and the box plots in Figure 27, the median score of the older group is visually higher than that the other birth date group.

Individual group membership varied based on the past school entry date. Twenty-five % of the entire 8th grade class (or 32% of the study sample) were students who had been held out of kindergarten for a year. The youngest group with
summer birth dates represented only 10% of the entire class. It seems as if the trend in the two school districts from which the data was gathered was for parents to hold out those who have birth dates in June, July, August, and September. The group of students that entered kindergarten in 1988 and repeated kindergarten or were placed in a transition class represented 15% of the class.

Conclusions

It is somewhat difficult to make observations about the younger five year old group because of its small size. It appears that many of the students who would have been eligible for this group are being held out of kindergarten for another year. Consequently, there are fewer students entering kindergarten as young five-year olds. From a statistical standpoint, the data do not support the hypothesis that students who entered school as young five-year olds scored significantly different reading levels than the older students in the same grade level. Comparison of differences between males and females were also inconclusive.

From a graphical point of view, there are clearly differences to be seen among the older students who entered kindergarten as six years olds. These students tended to have higher reading scores when compared to all of the students who entered kindergarten as five-year olds.

Recommendations

Further research of this type of study would be beneficial for both parents and educators. A much larger sampling study is needed perhaps using the controlling variable IQ in the equation to enhance the validity of this type of study. If a larger study was conducted, perhaps larger cell membership for this kind of analysis would
be possible. It is also recommended that putting the retained group of students into the analysis might more clearly capture what appears to be happening in the data of such samples.
APPENDIX
Figure 29

**Frequency of scores for students who were retained**

- **8th grade reading scores on the 8th grade Ohio Proficiency Test**
  - [Graph showing frequency of scores for females and males.]

Figure 30

**Frequency of scores for Special Education students**

- **8th grade reading scores on the 8th grade Ohio Proficiency Test**
  - [Graph showing frequency of scores for females and males.]
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