

**THE EFFECTS OF GENDER AND ENTRY AGE IN KINDERGARTEN
ON BRIGANCE AND T-CAP SCORES**

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THE EFFECTS OF GENDER AND ENTRY AGE IN KINDERGARTEN
ON BRIGANCE AND T-CAP SCORES

A Field Study
Presented to the
Graduate and Research Council of
Austin Peay State University

In Partial Fulfillment
Of the Requirements for the Degree
Educational Specialist

Lisa Lynne Barron

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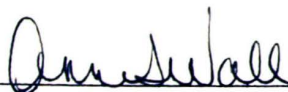
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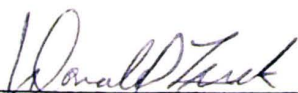


Dr. Carlette Hardin
Major Professor

We have read this Field Study
and recommend its acceptance.

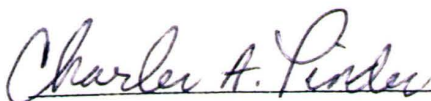


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DEDICATION

This field study is dedicated to my wonderful family. My husband, Ronnie, and my three spectacular sons, Chris, Caleb, and David have been a constant source of love and support. They have taken on extra duties around the house to allow me the freedom to pursue my dreams. I am so grateful to them for their encouragement.

LIST OF TABLES

Table	Page
2.1 Cutoff Dates for Kindergarten Eligibility	17
4.1 Kindergarten Entry Ages	30
4.2 Brigance Descriptive Statistics	31
4.3 Reading Composite Descriptive Statistics.	32
4.4 Statistical Results for Brigance Scores By Ages	33
4.5 Statistical Results for Reading Scores By Ages. . .	34
4.6 Statistical Results for Brigance Scores by Gender .	35
4.7 Statistical Results for Reading Scores by Gender. .	35
4.8 Statistical Results for Brigance by Gender and Age.	36
4.9 Statistical Results for Reading Scores by Gender And Age	37

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ABSTRACT

LISA LYNNE BARRON. The Effects of Gender and Entry Age in Kindergarten on Brigance and T-CAP Scores (under the direction of DR. CARLETTE HARDIN).

This study analyzed and evaluated the Brigance and second grade T-CAP reading composite scores of three middle Tennessee elementary schools in relationship to kindergarten entry age and gender. The total number of participants was 262, 133 male and 129 female. Unpaired t-tests, ANOVA, and MANOVA tests were used to analyze data for significant differences between group means. The study was conducted to test six null hypotheses at the .05 level of confidence. Results of the study indicated that there was not a significant difference in the Brigance scores based on kindergarten entry age and/or gender and there was not a significant difference in the T-CAP scores based on kindergarten entry age or gender.

TABLE OF CONTENTS

CHAPTER	Page
LIST OF TABLES	ix
I. INTRODUCTION	1
Statement of the Problem	1
Purpose of the Study	2
Significance of the Study.	2
Research Questions	2
Hypotheses	3
Limitations.	4
Assumptions.	4
Definitions of Terms	5
II. REVIEW OF LITERATURE	6
Introduction	6
School Readiness	6
Schools and Communities Need to Be Ready	8
Gender	10
Assessments.	10
Types of Assessments	12
Age Eligibility.	16

Delayed Entry.	19
Retention.	21
Transitional Classes	22
Conclusion	23
III. METHODOLOGY AND PROCEDURES	25
Overview	25
Research Design.	25
Participants	25
Instrument	26
Procedure.	26
Data Analysis Plan	27
IV. DATA AND RESULTS	29
Demographics	29
Summary.	37
V. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS	38
Discussion	38
Conclusions.	41
Recommendations.	43
References.	45
Appendices.	51
A. Austin Peay State University Institutional Review Board Approval.	52
B. Cheatham County School Board Approval.	54

CHAPTER I

INTRODUCTION

In the United States, there is a wide range of ages considered appropriate for entrance to kindergarten. While there are many factors leading up to kindergarten that can help a student achieve success, such as home environment and preschool attendance, age of entry is one of the only factors that can be required by the state. The debate is ongoing over what is the most appropriate entry age for a kindergarten student and does this age have any effect on the student's success in kindergarten as well as later test scores.

Statement of the Problem

In Tennessee, kindergarten is compulsory. State law dictates that a student must be five years old before September 30 to be eligible to attend. The problem is to determine if there is a significant difference in the Brigance (Curriculum Associates, 1997) and T-CAP

(CBT/McGraw-Hill, 2003) reading composite scores of students based on entry age in kindergarten, and if there is a significant difference in the Brigance and T-CAP reading composite scores of kindergarten students based on their gender.

Purpose of the Study

The purpose of this study is to determine if there is a significant difference between their kindergarten entry ages and/or gender and their scores on the Brigance K-1 screen and the second grades reading T-CAP.

Significance of the Study

Parents, teachers, and administrators often search for guidance when evaluating if a student is ready to begin kindergarten. Although state guidelines offer a cut-off date, the decision of whether to begin or wait another year is often left up to the parents or guardians. The cut-off date varies widely between states, and there is an on-going debate over which date is the most appropriate.

Research Questions

1. Is there a significant difference in the Brigance scores of students based on their kindergarten entry age?

2. Is there a significant difference in the second grade T-CAP reading composite scores of students based on their kindergarten entry age?
3. Is there a significant difference in the Brigance scores of kindergarten students based on their gender?
4. Is there a significant difference in the second grade T-CAP reading composite scores of students based on their gender?
5. Is there a significant difference in the Brigance scores of students based on their kindergarten entry age and their gender?
6. Is there a significant difference in the second grade T-CAP reading composite scores of students based on their kindergarten entry age and their gender?

Hypotheses

1. There is no significant difference in the Brigance scores of students based on their kindergarten entry age.
2. There is no significant difference in the second grade T-CAP reading composite scores of students based on their kindergarten entry age.
3. There is no significant difference in the Brigance scores of kindergarten students based on their gender.

4. There is no significant difference in the second grade T-CAP reading composite scores of students based on their gender.
5. There is no significant difference in the Brigance scores of students based on kindergarten entry age and their gender.
6. There is no significant difference in the second grade T-CAP reading composite scores of students based on their entry age in kindergarten and their gender.

Limitations

This study was confined to selected students in three targeted public elementary schools in a rural county of Tennessee. They were divided into three age groups according to their age upon kindergarten entry. Students who were voluntarily redshirted by their parents or retained were also included in this study. Each system has individual characteristics, and therefore may make it difficult to transfer these findings to a larger population.

Assumption

The following assumptions applied to this study:

1. The students' scores were achieved in the local school system during the school years from 2001 through 2004.

2. Test scores were accurate indications of student abilities.

Definition of Terms

1. Brigance K-1 screen - published by Curriculum Associates; evaluates speech/language, readiness, math, general knowledge, and pre-reading skills.
2. Early birthday - 60-63 months old; birthday June 1996-September 1996.
3. Middle birthday - 64-67 months old; birthday February 1996-May 1996.
4. Late birthday - 68-72+ months old; birthday September 1995 (or earlier).
5. T-CAP - Tennessee Comprehensive Assessment Program, published by CBT/McGraw-Hill.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The concept of "school readiness" became a topic of concern and research when it was included in the Goals 2000 initiative. In this plan to improve and reform education in the United States, school readiness was listed as its first goal (Goals 2000: Educate America Act, 1994). While there is no debate about the importance of this goal, the ability to accurately define and identify when a student is "ready to learn" is much more difficult.

School Readiness

Parents and teachers often have conflicting ideas of school readiness, although most parents believe that academic and behavioral skills are very important for a child to be successful in kindergarten. While teachers agree, they also view sitting still, sharing, and developmental skills like using a pencil as equally important (Diamond, Reagan, and Bandyk, 2000). Other

characteristics that were listed by teachers as evidence that a child is ready to begin kindergarten:

- physically healthy, rested, and well nourished
- communicates thoughts, wants, and needs verbally
- shows enthusiasm and curiosity when facing new activities (Welch and White, 1999).

The skills necessary for a child to be ready to enter kindergarten are five-fold: health, cognition, language/literacy, social/emotional, and approaches to learning (Emig, 2000).

Dockett and Perry (2003) have studied which factors in school readiness were considered the most important by teachers, parents, and children. They targeted eight areas to consider when making the transition to school:

1. Knowledge - facts and concepts that children know
(for example, the alphabet and colors).
2. Social adjustment to the school environment -
knowing how to get along with a group of children or
responding appropriately to adults.
3. Skills - abilities such as tying shoes or holding a
pencil or crayon correctly.
4. Disposition - child's attitudes towards school.
5. Rules - can follow expectations of behavior.
6. Physical characteristics - age and health.

7. Family issues - family support and interactions with the school.
8. Education environment - the general atmosphere of the school.

In their study, they also found a discrepancy between the expectations of parents, teachers, and children. The children felt the most important aspects were obeying rules and their attitudes toward school. They could recite a list of rules they were expected to follow and mostly related feeling good about school to having friends.

Parents expressed concern about their child's adjustment to school, mainly in being separated from them all day and the relationship they would have with the new teacher. Parents also worried about the school environment, security, and the daily schedule.

In this study, teachers mentioned the importance of skills and knowledge, but also agreed with the parents about the need for a good adjustment to their new environment. They wanted their students to be excited about learning and anxious to try new activities.

Schools and Communities Need to Be Ready

There is an increasing emphasis in the community, school, and families on providing an environment of

readiness. Children are not naturally "ready" or not "ready" for school. Their skills and development are influenced by a large measure by their own families and through experiences with other people and the community before they ever get to school (Maxwell and Clifford, 2004). School readiness has two parts: the child's readiness for school and the school's readiness for the child (Saluja, Scott-Little, and Clifford, 2000).

According to the National Education Goals Panel (1997), it should be the school's responsibility and commitment to be ready to educate the students that come each day. The NEGP has identified important characteristics of schools that are ready for children. They should:

1. Smooth the transition between home and schools.
2. Strive for continuity between daycare, preschool programs and elementary schools.
3. Help children learn and make sense of the world around them.
4. Make a commitment to every child's success in school.
5. Demonstrate that they are committed to every teacher's success.
6. Introduce and expand teaching strategies that have been proven to improve achievement of the students.

7. Commit to change educational practices if they do not help children learn.
8. Serve the children in communities around the school.
9. Take responsibility for the results.
10. Establish and maintain strong leadership within the school.

Gender

According to Graue and DiPerna (2000), boys are more likely to wait a year to begin school, as well as be retained. Girls are more likely to enter early. While it is commonly believed that boys mature later than girls, the NCES (2000) reports that there is little difference in their early academic skills. The differences between boys and girls upon entering kindergarten are mainly developmental and behavioral. Boys are more active, have more trouble paying attention, and have less communication skills.

Assessments

Kindergarten assessments can be very helpful in giving the parents and teachers information in regard to how prepared a child may be to enter kindergarten. Assessments can be valuable resources for determining the skills and abilities of children and can be effective tools for

designing and providing quality services for children (Emig, 2000). The NEGP has listed four purposes for assessing children when they enter kindergarten:

1. To identify pre-existing skills of children and their needs.
2. To monitor trends in children's readiness for school and evaluation of services.
3. To identify children in need of additional services.
4. To determine the academic progress of children (1997).

In order to identify and describe major purposes for assessing young children, the NEGP report *Principles and Recommendations for Early Childhood Assessments* (Shephard, Kagan, and Wurtz, 1998), lists five major purposes:

1. Improve learning.
2. Identify children with special needs.
3. Evaluate programs.
4. Monitor trends over time.
5. Use for high-stakes accountability.

While potentially any test could be used for high-stakes accountability, the report cautions against using high-stakes accountability with children until at least third grade, since few assessment tools for young children meet high standards. It may be tempting to use the results of

tests to make decisions for placement, such as to deny or discourage some students to enter kindergarten, even when they meet the legal age. In the same way, teachers may be held accountable for their students' scores, even though the assessment tool did not meet standards necessary for high-stakes accountability. Safeguards should be in place to minimize any risk associated with the use of the scores and data (Maxwell and Clifford, 2004).

Types of Assessments

Typically, the type of assessments used with pre-kindergarten or kindergarten students can be divided into two groups according to Maxwell and Clifford (2004): naturalistic (informal), and standardized (formal).

Naturalistic assessments include observations, samples of work by the child, and teacher checklists. This is most often used for the purpose of improving learning. This type of assessment (sometimes referred to as authentic) provides a familiar environment for the child to demonstrate their skills and abilities and is best for providing a "true" picture of the child's knowledge (Niemeyer, Scott-Little, and Hussey, 2002).

Standardized tests are often used for identifying children that may have special needs, for evaluating

available programs, and in high-stakes accountability. These tests should be proven to have a high degree of reliability and validity (Niemeyer et al. 2002). High-stakes decisions should not be made on the basis of a test - the potential for making a mistake when dealing with young children is too great. Decisions on a child's placement in school should be based on his/her work, teacher observations, input from the parents, plus the results of a school wide screening (Scott-Little and Niemeyer, 2001).

The purpose of any assessment used should be made clear before an appropriate assessment tool can be selected. A variety of assessment tools or approaches are needed to address a variety of purposes (Maxwell & Clifford, 2004). Great care should be used when administering testing. The National Association for the Education of Young Children (2000) cautions that educators 1) recommend appropriate testing in the beginning of the school years, 2) interpret correctly and use the information gathered by the assessments, 3) communicate with parents and other teachers what the information means in regard to students progress; and 4) prevent and/or correct any misuses or misinterpretations of the tests.

Although assessments can be helpful in identifying special problems and planning programs to benefit the students, research evidence does not support using readiness tests instead of age to determine school entry (Stipek, 2002). Various factors may contribute to scores being lower for some groups: children from lower socioeconomic groups, from ethnic groups such as African American and Hispanic, and children from homes where English is not the primary language typically have lower reading and math skills upon entering kindergarten (Zill and West, 2001). In addition, most of the standardized tests were developed for the middle-class, English-speaking, Caucasian culture. Therefore, it is important that schools be sensitive to the students' cultures and primary language and utilize every strategy possible to make the testing appropriate for the students (Scott-Little and Niemeyer, 2001).

One of the most widely used screenings is the Brigance K&1 Screen. It is a 12-subtest instrument that takes approximately 15 minutes for a teacher to administer. The subtests are designed to measure a wide range of skills that include language, numbers, motor skills, body knowledge, recognition, and ability to follow directions. The maximum score is 100; it is suggested that a child with

a score of 65 or less be referred for further evaluation (Mantzicopoulos, 1999). Because the Brigance is an informal screening, no educational decisions such as placement or delayed entry should be made on the basis of the scores (Costenbader, Rohrer, and Difonzo, 2000).

Another widely used screening test is the DIAL-R. It is also given to individual children and measures three areas of behavior: motor, conceptual, and language. It is viewed as an effective screen because it assesses behavior in a wide range of settings and with several sources, it has sufficient standardization, reliability and validity, and it has brief tasks (Costenbader et al. 2000). However, professionals again caution that a more complete evaluation of children should be done before any educational decisions are made.

Another test that is often used is the Gesell School Readiness Test. It is designed to measure a child's developmental maturity as it relates to skills, knowledge and abilities the child has. Costenbader et al. (2000) find that this assessment is outdated, the psychometrics are inadequate, and the general theory that school readiness should be tied to maturity is unfounded.

In general, all kindergarten assessments should:

- be used for the purpose it was designed.
- be appropriate for the age of the child.
- collect data on a wide range of a child's development and abilities.
- be naturalistic (authentic).
- be sensitive to cultural and language differences.
- be adaptable for children with disabilities.
- collect information from several sources.
- provide data that schools can be confident about.
- have a realistic data collection process for schools and school districts (Scott-Little and Niemeyer, 2001).

Age Eligibility

Although there are various ways to assess when a child is able to go to school, age is most often used to determine eligibility. In fact, Marshall (2003) asserts that "the only legally and ethically defensible criterion for determining school entry is whether the child has reached the legal chronological age of school entry" (p. 2). The cut-off dates for kindergarten are not uniform across the United States. Table 2.1 displays the wide

range of cut-off dates for kindergarten students (Saluja, Scott-Little, and Clifford, 2000):

Table 2.1

Cutoff Dates for Kindergarten Eligibility

Date	States Using Cutoff Date
June 1	Indiana
July 1	Missouri
August 15	Alaska
August 31	Delaware Kansas North Dakota Washington
September 1	Alabama Arizona Florida Georgia Idaho Illinois Minnesota Mississippi New Mexico Oklahoma Oregon South Carolina South Dakota Texas West Virginia Wisconsin
September 2	Utah
September 10	Montana

Table 2.1 (continued)

Cutoff Dates for Kindergarten Eligibility

Date	States Using Cutoff Date
September 15	Arkansas Iowa Wyoming
September 30	Nevada Ohio Tennessee Virginia Louisiana
October 1	Kentucky
October 15	Nebraska Maine
October 16	North Carolina
December 1	Michigan New York
December 2	California
December 31	Rhode Island Hawaii Maryland
January 1	Connecticut

Note. These states determine the date at the local or district level:

Colorado, Massachusetts, New Hampshire, New Jersey, Pennsylvania.

The modal cutoff date is the beginning of September; twenty-three of the forty-five states that have designated cutoff dates are September 1 or earlier. Only sixteen states have cutoff dates from September 2 through January 1

(Saluja et al. 2000). Between 1975 and 2000, 22 states moved the birth date cutoff to an earlier point in the year. Typically, the rationale for this change was to prepare children to be able to handle the academic kindergarten curriculum and to more accurately be able to compare kindergarten students in one state to students in another state based on national achievement tests (Stipek, 2002). Notwithstanding, the National Association for the Education of Young Children's position statement on school readiness (2002) states that raising the legal entry age, or voluntarily holding children back from kindergarten, will not guarantee that more children are "ready" for kindergarten. Not only does it not ensure a child's success, it may also prevent children with no access to high-quality preschool before kindergarten.

Delayed Entry

The entry date is often of little importance, however, since many parents choose to delay the entry of their children who may be close to the cutoff. Regardless of the deadline there will be a wide range of abilities and ages in the classroom (Carlton and Winsler, 1999). Older kindergarteners demonstrate several differences in their knowledge, skills, and behavior. According to the National

Center for Education Statistics (NCES), characteristics of older kindergarteners include they are closer to being able to read, are closer to being able to do math, know more about science and nature, display more advanced motor skills, are more socially adaptable and have less behavior problems, and are more persistent and eager to learn (2000).

While studies show that relatively older children have a slight academic advantage over their younger peers in the first few grades of school, that advantage typically disappears and levels out (Stipek, 2002). Voluntarily holding a child out (often referred to as "redshirting") has other disadvantages: it can deny them opportunities for cognitive growth through social interaction with their age-mates and implies that children have failed at school even before they begin. In addition, by the end of the primary level, children whose kindergarten entry is delayed do not perform better than peers who enter on time. Another potential problem caused by delayed entry is that it makes the average age of the kindergarteners rise. This can cause policymakers to expect more academically out of the entire class and its teachers, and put too much emphasis on the academic achievements of kindergarteners (Diamond et al. 2000).

Most redshirted children tend to be younger boys, and are more likely to be children of color and come from poverty (Graue and DiPerna, 2000). Delay or denial of entry to school, whether overt or subtle, increases the differences between social classes and could be seen as a denial of a child's civil rights (NAECS, 2000).

Therefore, it is a school's responsibility to educate all children who are legally old enough to attend kindergarten, regardless of their skills (Maxwell and Clifford, 2004).

Retention

So what options are available to parents whose child met the requirements for entrance into kindergarten, has attended kindergarten for the school year, but is not ready to promote to first grade? For many, retention is presented as the next step. This option however should be rejected, according to recent research. Retention of kindergarten students does not help them catch up to their peers academically. At the end of first grade, those students held back in kindergarten were not significantly different from a comparison group of children who had been promoted to first grade at the end of their kindergarten year (Gay, 2002). Older students, either through delayed entry or retention, are also often over-referred for

special education services according to Wallingford and prout (2000).

In the area of behavior problems, retained children in kindergarten displayed improvement from first to second grade, but leveled off by third grade. Children retained because of inattention continued to have the same problems in first and second grades (Mantzicopoulos, 1997). Even though immaturity and behavior problems are often cited as reasons for retention, children who have been retained early often display more problems especially in middle and high school with social adjustments, behavior problems, increased stress, and ultimately may leave high school without graduating (NAECS, 2000).

Transitional Classes

Another option might be placement in a transitional class, sometimes referred to as "developmental kindergarten". Some children who meet the age eligibility are immature and would not be successful if put in a traditional, full-day kindergarten. Some of the benefits of a transitional class are smaller class size (between 11 and 13 students), more individualized attention, time for reinforcement of skills, builds on the abilities of students, and offers whole-language instruction (Harris,

2003). By the end of the transitional year, students should be prepared to be successful in regular kindergarten. The goal is to prevent students from being retained by giving them more time to mature and be prepared for academic kindergarten.

While a transitional class may seem like a good idea, unfortunately research does not show any long-term benefits. Although there may be some positive short-term effects, by third grade these effects have diminished (Gay, 2002). In addition, there may be harmful social effects to children who are placed in a transitional or developmental class. They have been separated from children who could be positive role models for school success, and they often display the same low self-esteem behaviors as are seen in children who have been retained (Nelson, 2000). These children feel branded as failures, they have lowered expectations, less access to the regular curriculum, and their future progress tends to be more limited throughout their education (NAECS, 2000).

Conclusion

In conclusion, the burden of readiness for kindergarten should not rest on the child, but rather on their families, early environments, schools, and

communities (Maxwell and Clifford, 2004). Stipek (2002) asserts that to benefit our children, we should focus more on making school ready for children rather than on making children ready for school. In their position statement, the NAECS (2000) recommends several adjustments that schools need to do to be more responsive to the needs of young children: reduce class size, make the curriculum less abstract and more related to a child's conceptual development, and insist on the most highly-qualified and trained kindergarten teachers. Attention and resources should be diverted to improving kindergarten curriculum and to the education of parents, communities, and administrators. It should be the responsibility and concern of all involved to be prepared to meet the needs and challenges of young children entering kindergarten.

CHAPTER III

METHODOLOGY

Overview

Tennessee state law dictates that a student must be five years old before September 30 to be eligible to attend kindergarten. Teachers, however, believe that children whose birthdays are prior to September 30 may be too immature to start school.

Research Design

This was a descriptive study that analyzed pertinent data related to selected students and an analysis of any significant difference in their scores on the Brigance and second grade T-CAP reading composite scores based on age of kindergarten entry and/or gender.

Participants

The sample for this study was the entire population of third grade students in 2004-2005 (who entered kindergarten for the school year 2001-2002 and took the 2nd grade T-CAP

in April 2004) in three elementary schools in a rural southern state. Between the three schools there were fifteen classrooms and a total of 262 students.

Permission was obtained from each individual school principal, the school system, and the Institutional Review Board of the supervising school. Since the study involved analysis of data and not direct contact with students, there were no risks to the students.

Instrument

In this study there was an analysis of kindergarten entry age and gender and its effect on Brigance and second grade reading T-CAP scores. Data was gathered from the cumulative school records of the students. ANOVA, MANOVA, and t-tests were performed and StatView (2000) was used to analyze the results.

Procedure

The cutoff age for entry into kindergarten in the state is 5 years old by September 30. For the purpose of this study, the students were assigned to categories based on their ages by September 30 in months. The students were divided into three age groups. Group one was the youngest group and included students who were 60 - 63 months old upon entering kindergarten. Group two was the middle entry

age group and included students of 64 - 67 months old. Group three was the oldest group of students and included students from 68 months through 71+ months. This group also included those students retained, as well as those voluntarily redshirted by their parents.

The cumulative school records of 262 students from three elementary schools were reviewed. For each student, the following information was recorded: gender, kindergarten entry age in months, Brigance score in kindergarten, and the reading composite score from the 2nd grade T-CAP.

Since this was a blind study, confidentiality was ensured for the schools as well as for the students. The individual schools, teachers, and students' names were not recorded with the information and data analyzed in the study.

Data Analysis Plan

The information gathered from each student's cumulative record was compiled and analyzed. Data were entered into a computer using the StatView software application (StatView, 2002) and statistical procedures were performed.

Unpaired *t*-tests were performed to test the hypotheses for significance difference in Brigance and T-CAP scores based on gender. A one-way analysis of variance (ANOVA) was performed to determine the statistical significance in Brigance and T-CAP scores based on entry age. A two-way analysis of variance (MANOVA) was used to determine the statistical significance between gender, kindergarten entry age, and the interaction of gender and kindergarten entry age. All of these tests were performed at the .05 confidence level.

CHAPTER IV

DATA AND RESULTS

Demographics

This study analyzed the cumulative records of 262 students, 133 males and 129 females, who entered kindergarten in the school year 2001-2002. These students came from three elementary schools and a total of fifteen classes. Their scores on the Brigance Screen, given at the beginning of kindergarten in 2001, and their reading composite score on the 2nd grade T-CAP, given in April 2004 were recorded.

Students in this study were required to be five years old by September 30 in order to enter kindergarten. The participants were divided into three age groups. Group one was the youngest group and included students who were 60 - 63 months old upon entering kindergarten. Group two was the middle entry age group and included students of 64 - 67 months old. Group 3 was the oldest group of students and included students from 68 months through 71+ months. This group also included students who were held back voluntarily

by their parents, as well as those who had been retained in kindergarten. Table 4.1 illustrates the number of students in each age group.

Table 4.1

Kindergarten Entry Ages

Group	Age in Months	Birth Months	n
1	60-63	June 1996- September 1996	49
2	64-67	February 1996- May 1996	93
3	68-72+	September 1995 (or earlier) -	120

StatView (2002) statistical software was used to analyze the data retrieved from the students' cumulative school folders. The dataset contained information about the following five variables:

1. Number - Participants were from fifteen classrooms in three elementary schools. No record was made of the students' names nor their respective schools.
2. Gender - Participants were identified by gender.
3. Age group - Participants were grouped into three groups according to their monthly age.

4. Brigance - A screening tool given during the first week of kindergarten to determine basic knowledge and skills. The score is based on a possible 100 points.
5. Reading Composite - Score from the Tennessee Comprehensive Achievement Program (T-CAP). The reading composite score has a possible score of 99.

Table 4.2 illustrates the descriptive statistics of the Brigance Screen scores of the sample 262 students. The statistical report indicated a high score of 100 out of a possible 100, a low score of 46, and a mean of 89.283. There were 66 students missing a Brigance score. This was due mainly to students who attended kindergarten in another school system where the Brigance screen was not given.

Table 4.2

Brigance Descriptive Statistics

Possible	Minimum	Maximum	Std. Deviation	# Missing
100	46	100	10.933	66

Table 4.3 illustrates the descriptive statistics of the reading composite scores from the T-CAP tests. The statistical report indicated a high score of 99 out of a possible 99, a low score of 1, and a mean of 63.621. The number of scores missing is due to transfer students who had not taken the T-CAP in their previous school.

Table 4.3

Reading Composite Descriptive Statistics

Possible	Minimum	Maximum	Std. Deviation	# Missing
99	1	99	23.969	7

Null Hypothesis 1: There is no significant difference in the Brigance scores of students based on their kindergarten entry age.

The one-way analysis of variance (ANOVA) analyzed data for groups 1 and 2, 1 and 3, and 2 and 3. The descriptive statistics of the Brigance scores split by age category indicated a p -value of .0526 for groups 1 and 2, and a p -value of .0922 for groups 2 and 3. For groups 1 and 3 the p -value was .7921. All of these p -values were greater than the alpha of .05, so the null hypothesis was retained for all of these groups, revealing no significant difference in

the Brigance scores based on entry ages. Table 4.4 illustrates the ANOVA for the Brigance scores with the ages as the grouping variables.

Table 4.4

Statistical Results for Brigance Scores Split by Ages

Groups	Mean Diff.	DF	t-Value	P-Value
1,2	-3.521	114	-1.959	.0526
1,3	-.610	124	-.264	.7921
2,3	2.911	152	1.695	.0922

Null Hypothesis 2: There is no significant difference in the second grade reading T-CAP scores of students based on their kindergarten entry age.

The data in Table 4.5 illustrates the statistical results for the reading composite scores split by age groups. While groups 1 and 2 had a p -value of .5894, and groups 1 and 3 had a p -value of .2002, groups 2 and 3 had a p -value of .0338, lower than the alpha of .05. This indicated a statistically significant difference and the null hypothesis was therefore rejected.

Statistical Results for Reading Scores Split by Ages

Groups	Mean Diff.	DF	t-Value	P-Value
1,2	-1.927	137	-.541	.5894
1,3	5.534	164	1.286	.2002
2,3	7.462	207	2.136	.0338*

*p-value less than .05

Null Hypothesis 3: There is no significant difference in the Brigance scores of kindergarten students based on their gender.

The data in Table 4.6 illustrates the statistical results from the unpaired t-test for Brigance using gender as the grouping variable. Between male and female there was very little difference between the mean scores of the two groups. The results of this analysis also indicated a p-value of .4872. This is greater than the alpha of .05, so the null hypothesis was retained.

Table 4.6

Statistical Results for Brigance Scores Split by Gender

Gender	n	Mean	Mean Diff.	DF	t-Value	P-Value
Male	106	88.778				
			-1.086	196	-.696	.4872
Female	92	89.864				

Null Hypothesis 4: There is no significant difference in the second grade T-CAP reading scores of students based on their gender.

The data in Table 7 illustrates the statistical results for the T-CAP reading scores split by gender. There were less than 2 points difference in the mean of the two groups. The *p*-value of .5271 does not indicate a significant difference since it is greater than .05 and the null hypothesis was retained.

Table 4.7

Statistical Results for T-CAP Reading Scores by Gender

Gender	n	Mean	Mean Diff.	DF	t-Value	P-Value
Male	130	64.558				
			1.896	255	.633	.5271
Female	127	62.661				

Null Hypothesis 5: There is no significant difference in the Brigance scores of students based on kindergarten entry age and their gender.

Using a two-way analysis of variance, the interaction of the gender and age group in regards to the scores of the Brigance were analyzed. Table 4.8 illustrates that the p -value of gender was .4003, of age was .1276, and of gender and age was .5027. All of these p -values were greater than .05 and the null hypothesis was retained.

Table 4.8

Statistical Results for Brigance by Gender and Age Groups

Variable	DF	Sum of Squares	Mean Square	F-Value	P-Value
Gender And Age	2	164.543	82.271	.690	.5027

Null Hypothesis 6: There is no significant difference in the second grade T-CAP reading scores of students based on their entry age in kindergarten and their gender.

The data in Table 4.9 illustrates the statistical results for the T-CAP reading scores analyzing the

interaction of gender and age groups. The results indicated a p -value of .2768 for gender and age groups combined. There was no statistically significant difference. The p -value was greater than the alpha of .05, and the null hypothesis was retained.

Table 4.9

Statistical Results for Reading Scores by Gender and Age

Variable	DF	Sum of Squares	Mean Square	F-Value	P-Value
Gender and Age Groups	2	1460.730	730.365	1.291	.2768

Summary

This chapter addressed the analysis of data to determine the effect of entry age and gender on Brigance and T-CAP reading scores. The data were presented as they addressed each of the six null hypotheses.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This study analyzed and evaluated the Brigance screen and second grade T-CAP reading composite scores of three rural middle Tennessee elementary schools in relationship to the following variables: entry age in kindergarten and/or gender. This chapter is a discussion of the study and research findings. Conclusions and recommendations for further research are also included.

Discussion

The total number of participants was 262, 133 male and 129 female. The participants were students at three rural middle Tennessee elementary schools who had entered kindergarten for the 2001-2002 school year and taken the second grade T-CAP during the 2003-2004 school year.

The students were divided into age groups according to their age in months at the time of entry into kindergarten. In Tennessee, children must be five by September 30 to enter kindergarten. Group 1 was the youngest group and

included students with ages of 60 - 63 months. There were 49 students in this group. Group 2 included students ages 64 - 67 months. There were 93 students in this group. Students ages 68-72+ months were in group 3. There were 120 students in this group. This was not only the largest group, but also had the oldest students.

The following data was recorded from the cumulative folders of each of the students in this study: kindergarten entry age, gender, Brigance and second grade T-CAP reading composite scores.

The Brigance Screen was given during the first week of kindergarten to determine basic knowledge and skills and had a possible score of 100 points. The mean was 89.283. Of the 262 students, 66 students had not taken the Brigance, due to attending kindergarten in another school system.

The reading composite scores of the second grade Tennessee Comprehensive Assessment Program (T-CAP) were also recorded. There was a possible score of 99. The mean for the participants was 63.621. Out of 262 participants, there were seven that had not taken the test due to transfers from another school system.

Unpaired *t*-tests, ANOVA, and MANOVA test were used to analyze data for significant differences between group

means. The study was conducted to test six null hypotheses at the .05 level of confidence. The data were analyzed with the statistical program StatView (2002).

Of the six null hypotheses, five were retained, which indicated that statistically there was not a significant difference in the scores of the Brigance and second grade reading composite scores based on gender, not a difference in the Brigance based on age, and there was not a difference in the second grade reading composite scores, nor in the T-CAP reading scores based on the interaction of age and gender. These findings are supported by the research conducted by Gay (2000) and Stipek (2002). They reported that age and gender did not have any bearing on the scores of the Brigance and later T-CAP scores.

Although older kindergartens might have a slight advantage at the beginning, this advantage seems to level out as the children continue in school.

For the hypothesis comparing second grade T-CAP reading scores and their kindergarten entry age, a one-way analysis of variance (ANOVA) analyzed data for groups 1 and 2, 1 and 3, and 2 and 3. After analyzing the results, the null hypothesis was rejected because the p -value of groups 2 and 3 was .0338, which was lower than the alpha of .05. Even though it was only slightly lower, it still indicated

a statistically significant difference in the reading scores of the participants based on age.

It is possible that the inclusion of the retained students in the third group might have had an effect in the results of this analysis. The middle age group's scores were higher than the older (3rd group's) scores. The scores of those students retained may have brought down the scores for the third group, thus not giving an accurate picture of the group.

Conclusions

The purpose of this study was to determine if kindergarten entry age and gender had a statistically significant impact on Brigance and second grade reading T-CAP scores. Data from the students' cumulative school records were recorded and analyzed. The following conclusions can be made based on the results of the research:

1. Kindergarten entry age was found not to have a statistically significant effect on the Brigance scores of students. The youngest students (60 months old) and the oldest students (72+ months old) had relatively equal Brigance scores.

2. Kindergarten entry age was found to have a statistically significant effect on the T-CAP reading scores of students. The reading scores of groups 2 and 3 (the middle and oldest groups) were slightly higher than the scores of the younger group. This is the only area in the study that age was found to be factor in the scores of the participants. The older and largest group of students were students ages 68 - 71+. This included students that were voluntarily held back (redshirted) by their parents as well as those who were retained in kindergarten.
3. Gender was not a factor in the Brigance scores of the participants. Male and female had relatively equal scores.
4. Gender was also not a factor in the reading scores of the students in the study.
5. Entry age and gender combined did not make a difference in the Brigance scores of the students.
6. Entry age and gender combined did not make a difference in the T-CAP reading scores of the participants in this study.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. A follow-up study is needed to determine if kindergarten entry age and/or gender have any effect on the scores of students in middle school and high school.
2. This study should be conducted with more racially diverse students, with diverse backgrounds, with urban as well as rural schools, and with economically disadvantaged students.
3. A follow-up study is needed to determine if the retained students in the older group had any impact on the study. Another study could be done either analyzing them as a separate group, or disregarding this group when gathering the data.
4. A follow-up study is needed to determine the characteristics of the retained students so they might be targeted earlier in the kindergarten year and teaching strategies and resources might be used to benefit them.
5. A follow-up study is needed to compare test scores from students who are in a state that

requires a relatively early cut-off date (September 30) and therefore have younger children entering kindergarten, to test scores from students with a later cutoff date (December 31) and therefore have older students entering kindergarten.

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APPENDICES

APPENDIX A

Austin Peay State University

Institutional Review Board Approval

AP
Austin Peay
State University
College of Graduate Studies

February 24, 2005

Lisa Barron
401 Patricia Dr.
Ashland City, TN 37015

Re: Study Number 05-014: The Effects of Age in Kindergarten on Retention and Test Scores (Dr. Hardin).

Dear Ms. Barron:

Thank you for your application for the study listed above. Your study was reviewed at the February 11, 2005, meeting of the APSU IRB meeting.

The following further information and/or changes are required:

Item #3: Item #8: Please change to correct spelling of word. Instead of "attained" change to "obtained."

Item #13: Needs to state that data will be stored in Dr. Hardin's office.

The IRB committee suggested that permission be obtained from the principles of each school involved in the study and that the grammar contained in the research, corrected.

Again, once these changes have been submitted; you may continue with your study.

Sincerely,

Charles A. Pinder

Charles A. Pinder Ph.D.
Chair
Institutional Review Board

Cc: Dr. Hardin

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APPENDIX B

Cheatham County School Board Approval



CHEATHAM COUNTY

Board of Education

102 Elizabeth Street
Ashland City, Tennessee 37015

Interim Director
Lynn E. Seifert

Phone: (615) 792-5664

Fax: (615) 792-2551

November 5, 2004

Lisa Barron
401 Patricia Drive
Ashland City, TN. 37015

Dear Ms. Barron,

I am very pleased to learn that you are working toward your Educational Specialist degree at Austin Peay State University.

You do have permission to retrieve the data needed for your field study, without using the names of the students or schools. I am sure the principals of West Cheatham Elementary, East Cheatham Elementary, and Pleasant View Elementary will be happy to assist you.

It's been said that we teach more by what we are than by what we teach – thanks for being such a positive role model. If I may be of further assistance, please give me a call.

Yours in education,

Lynn E. Seifert
Interim Director of Schools

LES:cfc