HIGH-STAKES TESTING AND THE GENDER GAP:  
A STUDY OF FOURTH GRADE READING PERFORMANCE ON THE OHIO ACHIEVEMENT TEST

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A Thesis

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This study was designed to investigate the relationship between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test that was given to all fourth grade students in May of 2007. The statewide results showed that females outperformed males at all grade levels (three through eight) on the test (Ohio Department of Education, 2007a). The main focus of this study was to identify relationships that may exist between gender and each of the reading standards that were assessed (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) on the test. This study also examined gender differences among students’ overall reading scale scores on the test.

A sample of 88 students’ (56 males and 32 females) scores from the Ohio Fourth Grade Reading Achievement Test were collected and analyzed from three schools. For each standard and overall reading score that was provided, the number of males and females who performed above, at, and below the proficient levels were identified. After running statistical tests, the only standard that showed a significant difference between gender and performance was the Informational Text standard. This finding showed that twice the number of females scores fell in the below proficient range on the Informational Text standard when compared to the number of males.
I wish to dedicate this thesis to my family, who has always been there for me and who has given me never-ending love and support throughout my endeavors.

I would also like to dedicate this in remembrance of my dad and Ted, two men who always encouraged me to work hard and to do my very best.
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CHAPTER I. INTRODUCTION

Reading has become a major concern in the eyes of teachers, administrators, government officials, and other professionals in the United States. A large emphasis has been placed on reading and several programs and high-stakes tests have been created to aid, further develop, and assess students’ abilities in reading. According to the American Psychological Association (2007), “many school districts are mandating tests to measure student performance and to hold individual schools and school systems accountable for that performance” (p. 1). These mandated tests are known as high-stakes tests when used to determine advancement or graduation (i.e., the “stakes.”). Educational administrators and other officials use the results of high-stakes tests to make vital decisions. For example, based on a student’s performance on a high-stakes test, “decisions, such as whether a student will move on to the next grade level or receive a diploma” may be made (American Psychological Association, p. 1). Since high-stakes tests are encouraged and mandated for schools at the national level, state departments of education have also created and adapted similar tests to assess students’ performance on specific academic content standards.

In the state of Ohio, achievement tests are given to students in grades three through eight to assess their performance and abilities in reading, writing, mathematics, science, and social studies. Each achievement test assesses students on material or information that they are expected to know by a certain grade level. The topics and information covered by the tests relate to the Ohio Academic Content Standards for each grade level and content area that is assessed.

The Ohio Fourth Grade Achievement Tests are tests that are given to all fourth grade students to assess their abilities in relation to reading, writing, mathematics, science, and social studies. By examining the scores from the Ohio Fourth Grade Achievement Tests, a variety of trends or relationships between students’ scores and performance within specific content areas
can be identified. While analyzing fourth grade students’ scores on state reading assessments, an interesting phenomenon is becoming more prevalent in the United States. This phenomenon, also known as the fourth grade slump, focuses on the relationship between fourth grade students’ reading scores once they begin fourth grade, compared to their scores in previous years.

According to Chall’s, Jacobs’, and Baldwin’s (1990) study that focused on children in poverty, as male and female students begin fourth grade, their scores begin to drop or slump in a variety of areas related to reading. Students “have particular difficulty defining abstract, more academically oriented words. In addition to vocabulary, word recognition and spelling scores begin to slip” (Gunning, 2005, p. 535). Many believe that students’ scores are dropping once they reach fourth grade because vocabulary and more abstract concepts are being introduced and taught in reading. Chall, Jacobs, and Baldwin summarize that theory by stating that in primary grades (grades 1-3), children are taught “letters, their sounds, and the relationships between them, and they learn to recognize whole words, and practice using these in reading of stories, poems, and other connected texts for comprehension and pleasure” (p. 45). On the other hand, once students begin fourth grade, instruction focuses “on the reading of unfamiliar texts and on the use of reading as a tool for learning” (p. 45). The differences may have an impact on students’ reading performance and scores once they begin fourth grade.

Overall, mandatory state and national tests are being implemented in schools all over the United States to assess students’ abilities and levels of performance in a variety of content areas. Results from these tests may show trends or relationships that exist among students and their school, gender, performance, etc. As a result of looking at students’ performances on different areas of state and national tests, teachers can become more aware of how to differentiate instruction to meet the needs of their students.
Statement of the Problem

Results from the 2007 Ohio Reading Achievement Test (Ohio Department of Education, 2007a) show that females outscored males on the test as a whole, at all grade levels (grades three through eight). According to other research findings (Chiu & McBride-Chang, 2006; Rutter, Caspi, Fergusson, Horwood, Goodman, Maughan, Moffitt, & Carroll, 2004), males are more likely to be identified as poor or struggling readers, when compared to females. These findings suggest that a relationship may exist between gender and reading performance. Previous research may suggest that differences occur by gender, but the issue regarding where such differences may occur has not been fully explicated. Without specific knowledge regarding where gender differences may occur on the test, little can be done to assist male fourth grade students.

Research Questions

This study investigated the relationships that may be present among gender and students’ level of proficiency on each subtest that is embedded within the Ohio Fourth Grade Reading Achievement Test. Students’ levels of proficiency (below proficient, proficient, or above proficient) were identified for the Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text subtests to determine whether there are significant relationships that exist among gender and proficiency levels. Students’ overall reading scores (scale scores) were also identified and placed into five performance ranges. Each student’s scale score placed them into one of the following ranges: Advanced, Accelerated, Proficient, Basic, or Limited. This study also investigated relationships that may be present between gender and students’ performance ranges.
The driving research question that guided this investigation was, “What is the relationship between gender and performance on the Ohio Fourth Grade Reading Achievement Test?” Five specific sub questions have also been identified:

1. What is the relationship between gender and performance on the Acquisition of Vocabulary standard?
2. What is the relationship between gender and performance on the Reading Process standard?
3. What is the relationship between gender and performance on the Informational Text standard?
4. What is the relationship between gender and performance on the Literary Text standard?
5. What is the relationship between gender and performance on the overall reading scores?

Rationale

According to Kleckler (2006) and the Ohio Department of Education (2007a), females tend to outperform males on overall reading related tasks and/or tests. Other historical and contemporary research findings also support these data (Gambell & Hunter, 1999; Lincoln, 1927; Pressey, 1918). Current research studies (Chiu & McBride-Chang, 2006; Rutter et al, 2004) have also shown that males are more likely to be identified as poor or struggling readers when compared to females. If significant differences between gender and reading skills/abilities have been identified, one may wonder with what specific skills or tasks males and/or females may succeed or struggle as they complete reading related tasks.
If the results from the Ohio Fourth Grade Reading Achievement Test show that females outperform males at all grade levels, on the test as a whole, one may ask the question, “Are there specific areas or standards on the test in which males and/or females appear to excel or struggle?” If significant relationships exist and/or are found between gender and the various subtests, it would seem plausible that teachers could use that information to differentiate instruction to meet the needs of students within their classrooms. It is hoped that the results of this study will help identify any relationships or trends that may exist between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test so that teachers, professionals, and parents may help children succeed in reading.

Definition of Terms

Some terms that will be used in this project are identified below, along with their descriptions and accompanying sources:

Acquisition of Vocabulary Standard- “Students use clues in texts and knowledge of word parts (e.g., slowly) to learn the meaning of new words. They can learn the meaning and pronunciation of new words by using dictionaries, glossaries, and other resources” (Ohio Department of Education, 2007b, p. 3).

Documents- a term used to describe information that is portrayed in charts, graphs, maps, lists, and/or tables. They require the reader to look for facts and information without having to read every single word (Elley, 1992).

Informational Text Standard - “Students recognize text features (e.g., section headings, graphs, diagrams) and examples of cause and effect. They distinguish between fact and opinion in texts they read. They summarize main ideas and support them with important details” (Ohio Department of Education, 2007b, p. 3).
Literary Text Standard- According to the Ohio Department of Education (2007b),

“Students describe the parts of a story (plot, setting, character, theme, conflict) and explain the features of different types of texts (e.g., poetry, fantasy). They also identify the special language an author uses (e.g., similes, metaphors)” (p. 3).

Reading Process Standard- “Students summarize reading materials by stating what they have read. They compare and contrast reading materials (e.g., myths, fables, instructions) with information from former sources” (Ohio Department of Education, 2007b, p. 3).

Limitations

Several limitations occurred with this study. While looking at students’ scores on each of the four subtests from the Ohio Fourth Grade Reading Achievement Test, the state supplies schools with only students’ overall scores on the test. Instead of providing a numerical score for each subtest, a symbol (-, +, =) was given to represent a student’s performance. Each symbol represented the students’ level of proficiency. For example, it a student received a “-” symbol, it meant that the student performed below the proficient level. If a student was given a “=” symbol, it meant that the student performed at the proficient level. Lastly, if a student received a “+” sign, it meant that the student scored or performed above the proficient level. These symbols were vague, so the exact degree to which students’ scores varied was difficult to determine. Even though it would be beneficial to learn more about the structure and different types of questions provided within each subtest, the Ohio Department of Education (ODE) does not provide detailed information regarding the questions that were given on the test. The ODE only provides sample questions and answers that can be viewed by the public. This means that this
study was limited to performance ranges and no analysis of specific types of questions was possible.

Summary

In summary, reading has become a major concern in the eyes of parents, teachers, administrators, and other stakeholders at district, state, and national levels. With this growing concern, high-stakes tests and other reading assessments have been implemented within classrooms at almost every grade level to assess students’ reading skills/abilities. Research has shown that females tend to outperform males on overall performance on reading related tasks and/or tests (Kleckler, 2006; Ohio Department of Education, 2007a) and that males are more likely to be identified as poor or struggling readers when compared to females (Chiu & McBride-Chang, 2006; Rutter et al, 2004). This research suggests that a relationship may exist between gender and reading performance.

Based on the results from the Ohio Fourth Grade Reading Achievement Test that was given to all fourth grade students in May of 2007, it appears that females outperformed the males on overall reading performance. The results from the Ohio Department of Education provide the percentage of males and females who performed at or above the proficient level on the test as a whole, but they do not show the relationship between gender and each of the four standards that were assessed on the test (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text). This information led to the creation of the driving question that guided this investigation, which was, “What is the relationship between gender and performance on the Ohio Fourth Grade Reading Achievement Test?” This investigation focused on the relationship that exists between gender and each of the four standards that were assessed on the test.
CHAPTER II. REVIEW OF LITERATURE

Currently, a great deal of emphasis is being placed on students’ performances on state and national tests, especially in the area of reading. One may ask, “Are there areas or instances where some students succeed and some students struggle with reading?” Research suggests that there may be a relationship between a student’s gender and his or her reading performance. This chapter focuses on historical and contemporary research that has been conducted to learn more about gender differences and how they may affect a student’s cognitive ability, reading performance, and specific reading skills.

Significant Historical Research

The question of whether or not a relationship exists between gender and reading is not a new concern or question that has arisen over the past few years. In a study of literature, Dwyer (1973) states, “The question of [gender] differences in reading has received wide attention from researchers and educators since the thirties” (p. 455). The results of historical studies have provided researchers and other professionals with information that has been used and built upon over the years to help others gain a better understanding of the relationship between gender and academic performance.

Significant statistical differences between gender and reading performance have been studied and identified even before the 1930s. After reviewing and evaluating several studies that relate to gender differences, Lincoln (1927) explains differences that occur between gender and specific skill/tasks. While looking at gender differences in relation to reading tests, Lincoln analyzed results from the 1917 St. Louis Survey and explained the significant trends that appeared. In the St. Louis Survey, approximately 300 students of each gender and at each grade level (first through eighth grade) were given the *Gray Oral Reading Test*. According to Lincoln,
the results showed that females were “one-fourth to one-half of a grade ahead of the [males] in accomplishment” (p. 67). Throughout Lincoln’s review of literature, he was able to identify a range of differences that were present between gender and cognitive tasks. After analyzing and explaining several research studies, Lincoln suggests that there are both maturational and environmental factors that may affect each gender’s performance on cognitive tasks.

Another historical study that shares similar findings to that of the St. Louis Survey and that has helped aid in the understanding of gender and cognitive abilities involves a study that was conducted by Pressey in 1918. Pressey’s study was designed to help answer the question, “Do [females] as a class average differently from [males], either in general intelligence or in certain special traits?” (p. 323). To answer this question, Pressey conducted the study with 2,544 school-aged children (1,342 females and 1,202 males) between the ages of 8 and 16. Each child was given a 200-item test that was comprised of 10 subtests. The 10 subtests assessed students on Rote Memory (for words), Logical Selection, Practical Arithmetic, Opposites, Logical Memory, Word Completion, Moral Classification, Dissected Sentences, Practical Information, and Analogies.

The tests were administered to all of the children and individual scores were found based on the total number of questions (points) that were answered correctly out of the total number of questions that were provided. Pressey (1918) found that at every age, females performed slightly higher than males by an average of 5.6 points until age 16, when males’ scores became almost equal to that of females. Pressey also decided to look at the extreme scores (low and high end of scores) to see if significant gender differences appeared. While looking at the extreme scores, “Of the lowest ten per cent, 61% (165 cases) are [males], leaving only 39% (102 cases) [females]” (p. 331). On the other hand, scores on the extreme high end differed. “The highest one
per cent for all four ages is composed of 86% [males] (12 cases) and 14% [females] (2 cases)” 
(p. 331). These data suggests that males’ scores may be more spread out and may fall within the 
extreme score ranges.

While looking at the specific tests, in relation to gender and performance, it appears that 
significant differences were found. “Tests six and eight (word completion and dissected 
sentences) are for all ages in favor of the [females] up to sixteen” (Pressey, 1918, p. 332). The 
data also showed that females scored higher than males on rote memory, and on literary tests 
(Opposites, Word Completion, Classification of Moral Terms, Dissected Sentences, and 
Analogies). Males, on the other hand, showed “superior ability on the arithmetic test and a 
slightly higher average on the test for practical information” (p. 333). These findings show that 
there appear to be gender differences between students’ abilities to complete specific cognitive 
tasks.

In her conclusion, Pressey (1918) suggests that these differences in scores may have been 
due to three main factors. The three main factors involve the idea that females develop faster 
than males (mentally and physically); females’ scores may average slightly above males’, and 
the “differences may be due to a weighting of the scale with a majority of tests which are easier 
for the [females]” (p. 338). Studies that have preceded Pressey’s study have also shown similar 
findings.

Moreover, succeeding studies have shown that females and males tend to excel in 
different cognitive tasks. Terman and Tyler (1954) studied and evaluated research that had been 
gathered from a variety of studies that focused on gender differences in a variety of abilities. 
After reading and studying statistical data that had been gathered from the historical studies, 
Terman and Tyler identified common findings among each of the studies. They found that
females ‘tend to excel on verbal types of problem; [males], on quantitative or spatial” (p. 1068). The literature and data that they had reviewed also showed that almost universally, achievement tests showed that females achieved higher scores in areas related to language and reading and males excelled in the areas of science and mathematics. These findings also support Pressey’s (1918) and Lincoln’s (1927) data.

In other historical studies, the data showed that females matured or developed (mentally and physically) quicker than males, but Anderson, Hughes, and Dixon (1957) found interesting gender differences between reading and rates of development. In Anderson’s, Hughes’, and Dixon’s study on children’s rate of reading development, it was found that females appear to read at an earlier age than males. The data from the study also showed that even though females may learn to read at an earlier age than males, that both genders’ rates of development are the same. These data suggest that because males’ and females’ rates of development are the same, there must be other factors that influence gender differences. This finding can also be used to support Lincoln’s (1927) statement that both maturational and environmental factors may affect or influence gender differences in reading performance.

Similarly, research findings have shown that the range of differences between gender and reading performance appears to increase as students get older. Gates’ (1961) study involved students in grades three through eight and focused on finding a relationship between gender and reading performance. Each student was given “all three of the Gates Reading Survey tests: Speed of Reading, Reading Vocabulary, and Level of Comprehension” (p. 431). The results from the study showed that females’ scores were higher than males and that the gap between the scores slightly increased as students moved through grade levels. These findings suggest that the gap between students’ scores increase with age; they also support the theory that there may be other
factors, besides biological factors and/or rates of development that may have an impact on
gender and reading performance.

Theoretical Orientation for the Study

The body of literature that has been written throughout the twentieth century suggests
that there are two major theoretical arguments that have been used to help explain differences
that exist between gender and reading performance. The two theoretical perspectives that have
been identified involve the idea that gender differences are due to either neurological or interest
and environmental factors. Some of the following studies that will be described may show
statistical differences between gender and reading performance, but they may not always
articulate the cause of the differences.

**Biological or Maturational Factors**

One theory that attempts to explain the relationship between gender and reading
performance involves the notion that biological or neurological functions are the contributing
factors that affect children’s learning. In Dwyer’s (1973) review of literature, a common finding
and/or suggestion that she found as to why females tend to have higher rates of reading
achievement involves the idea that the differences are due to females’ “relatively more advanced
stage of maturation or to differences in metabolic functioning which make it easier for [females]
to adapt to the physical limitations imposed on them by the educational process” (p. 456). This
explanation suggests that the reason females tend to surpass males in reading is due to the fact
that they mature much earlier than males and that they also appear to be better able to adapt to
classroom learning situations. This theory was widely accepted in the early twentieth century as
a major factor in the determination of one’s ability to succeed in school.
Current research has also supported the theory that biological and neurological factors can influence an individual’s learning. According to Spence’s review of recent studies (2007), research has shown that there are biological differences that are “hard-wired” within children’s brains that are not caused or influenced by culture. Spence notes that biological differences between genders can greatly influence the way children learn to read. With the use of new technologies and procedures, researchers have been able to locate, compare, and contrast differences within males’ and females’ brains.

While looking at and comparing males’ and females’ brains, significant differences have been observed and identified. According to Sax (2002), a six-year-old male’s brain looks like a four-year-old female’s brain and a 17-year old male’s brain is comparable to that of an 11-year-old female’s brain. These data support the idea that females may be achieving higher scores than males on specific tasks because a female’s brain develops much faster than a male’s brain.

In addition to looking at gender differences within the brain, researchers have also found significant differences among males and females that relate to cognitive tasks and abilities. For example, females, on average, tend to score higher on tasks that involve “Rapid access to and use of phonological and semantic information in long-term memory, production and comprehension of complex prose, fine motor skills, and perceptual speed” (Halpern, 1997, p. 1091). These findings suggest that females tend to excel in tasks that involve them recognizing letter-sound relationships and meanings within words, being able to remember or recall information that has been stored in long-term memory, writing and comprehending stories, being able to participate in tasks that involve them using or manipulating objects with their hands, and reading at an increased rate. These skills are comparable to the Acquisition of Vocabulary standard that is assessed on the Ohio Reading Achievement Tests. The Acquisition of Vocabulary standard
focuses on having students use context clues, semantic strategies, and their knowledge of word parts to learn the meanings of new words (Ohio Department of Education, 2007b).

On the other hand, males tend to score higher on tasks that involve the use of visual-spatial working memory, motor skills, responses related to space and time, and reasoning. Males also tend to score higher than females on tasks that focus on abstract mathematical and scientific skills (Halpern, 1997). This means that males appear to excel on tasks that involve them interpreting and gathering new information by visualizing it in their minds, participating in activities that involve the use of large motor skills (throwing, kicking, jumping, etc.), and being able to critically think about and make sense of information. These skills are comparable to the Informational Text and Reading Process standards that are assessed on the Ohio Reading Achievement Tests. The Informational Text standard encourages students to use section headings, graphs, diagrams, and other text features to summarize main ideas and to help explain examples of cause and effect that are present within a given text (Ohio Department of Education, 2007b). The Reading Process standard focuses on having students critically think about what they have read by summarizing, comparing, and contrasting reading materials with information that they have previously read (Ohio Department of Education, 2007b). These differences between gender and cognitive skills may affect the way students learn and process information while participating in various literacy activities.

Furthermore, the biological theory can also be supported by the results of gender and reading achievement scores from students all over the world. To see if a relationship existed between gender and literacy achievement across countries, Elley (1992) conducted a study on over 200,000 students between the ages of 9 and 14 in 27 different countries. For this study, all students were given two reading tests and were asked to fill out a questionnaire. The
questionnaires were provided to gather information related to each student’s background in reading and self-concept toward reading. Based on the data that he collected, Elley found that in 17 out of 27 countries, females’ mean scores were higher than males’ scores by at least 10 points. These data show that students’ achievement may be related to biological factors.

Interest and Environmental Factors

On the other hand, many believe that interest and environmental factors, in addition to maturational or biological factors, may affect students’ reading performance. Dwyer (1973) explains, “An important argument against accepting a purely maturational explanation of [gender] differences is that despite physical maturational differences in favor of [females], [females] do not evidence uniformly higher achievement than [males] in all subject matter areas” (p. 457). Dwyer suggests that if maturational factors were the only factors that affected students’ learning, females would consistently outperform males in all academic subject areas just because they develop/mature earlier. In addition, Pauley (1951) conducted a study among first grade students to look for trends between gender and reading scores. He found that even though the males in his first grade sample were older than the females, the females scored significantly higher than the males. These findings suggest that maturational factors cannot be the only cause explaining why females tend to outperform males in reading.

A theory as to why gender differences may exist within reading involves the notion that motivation levels and areas of interest differ between genders. Research has shown that there are differences between males’ and females’ selection of books when they are given the opportunity to choose what they want to read. Gambell and Hunter (1999) found that “almost all the books read by [females] were narrative fiction. In contrast, just over half of what the [males] read were novels; nonfiction, comics, joke books and picture books comprised the remainder” (p. 699).
Males also tend to “read more newspapers than [females]; their magazines tend to be information rich and analytical rather than narrative in style” (Coles & Hall, 2002, p. 105). Accordingly, Spence (2007) notes that, “[Males] like to read about humorous incidents and bodily functions” (p. 19). These data show that the types of texts that students choose to read tend to differ based on each student’s gender.

Not only do interests in the types of books that are read differ by gender, but it also appears that motivation may also influence gender differences. Females appear to read more than males (Coles & Hall, 2002). The results of McKenna’s, Kear’s, Randolph’s, and Ellsworth’s (1995) attitude survey, given to over 18,000 students in grades one through six, showed that females have a more positive attitude towards recreational reading than males at each grade level, which in turn, affects one’s motivation to read. On the other hand, Gambell and Hunter (1999) found that males prefer to be involved in active experiences and interactions, rather than silent and passive activities that are closely related to literacy tasks. These differences may account for higher female scores on reading achievement tests.

Another factor that may account for gender differences among reading performance entails a teacher’s gender and his/her selection of books that are read within the classroom. According to Shapiro and Dank (1980), 98% of primary grade teachers in North America are female. In a study to investigate gender differences in reading ability among elementary students in four English-speaking countries, Johnson (1973) found that “In England and Nigeria, [males] scored higher than [females] on most tests, while in Canada and the United States [females] generally scored higher than the [males]” (p. 67). Johnson suggests that these differences may be due to the fact that in Canada and the United States, most teachers are female and in Nigeria and England, a majority of the teachers are male.
Also, the types of books that teachers choose to read and incorporate within their classrooms may differ based on their gender and interests and what they deem relevant for students to read. A teacher’s book selections may affect how well male and female students relate to the books that they read and how interested they are to read them within the classroom. For example, Murisuo-Storm (2006) states that, “children’s books regarded by adults as quality books do not always correspond to children’s tastes” (p. 112). With this in mind, a teacher’s gender and his/her choice of books may account for gender differences among reading performance.

Overall, current and past research findings have shown that there are significant gender differences between students’ neurological skills/abilities, interests, and classroom environments. After reviewing literature related to both biological and interest/environmental factors, Labercane and Shapiro (1986) believe “that reading differences in the early years of schooling may be more influenced by basic biological differences,” but differences in the later grades may be influenced by external factors (p. 87). This statement supports the belief that both biological and interest/environmental factors may impact gender and reading performance.

Gender Differences in Performance on Reading-Related Tests

Several research studies and analyses have been conducted to further develop and understand the relationship between gender and reading performance. After reviewing several pieces of literature, Dwyer (1973) found that, females “characteristically learn to read earlier, achieve higher scores on standardized reading tests (more markedly so in the primary grades), and account for a lower percentage of the pupils referred for remedial reading work than do [males]” (p. 455). This statement and other research findings that relate to males’ and females’
reading performances will be examined in more detail in the following sections to see where gender differences appear on specific reading tests.

Gambell and Hunter (1999) explored and analyzed statistical information from writing and reading assessments that were collected by the Saskatchewan Department of Education in 1994, to learn more about the differences that exist between males’ and females’ scores on reading and writing tests. Gambell and Hunter analyzed over 3,200 fifth, eighth, and eleventh grade students’ reading and writing scores. On the reading tests, students were assessed on their ability to gather meaning, interpret reading, and then respond to a reading passage. The data from the assessments showed “Statistically significant differences between males and females on many dimensions” (p. 2). They found that females tend to outperform males in all areas of reading that were assessed (gathering meaning, interpreting reading, and responding to reading) at all grade levels.

Also, based on information gathered by the National Assessment of Educational Progress (NAEP) from national and state reading assessments given to students in grades four through eight in 2003, female students also scored higher than males. The NAEP collected a sample of students’ scores from each state, rather than collecting a national sample. After analyzing and interpreting the scores, it was found that, on average, females scored 7 points higher than males in grade four and 11 points higher at grade eight on the reading assessments (Donahue, Daane, & Grigg, 2003). These findings also support the research that has shown that the gap between reading and students’ scores, based on gender, appear to increase with age.

Similarly, according to the Ohio Reading Achievement Test results from May 2007, females scored higher than males, overall, in each grade level that was tested (grades 3-8). The data provided includes the number of male and female students who performed at or above the
proficient level on the test. Based on students’ scores in third grade, 73% of males and 79% of females were at or above the proficient level; 78% of males and 82% of females were at or above the proficient level in fourth grade; 78% of males and 83% of females were at or above the proficient level in the fifth grade; 75% of males and 80% of females were at or above the proficient level in sixth grade; 75% of males and 80% of females were at or above proficient in the seventh grade; and 77% of males and 83% of females in the eighth grade were at or above the proficient level on the test (Ohio Department of Education, 2007a). These statistics show that at each grade level there are a higher percentage of females who scored at or above the proficient level compared to the percentages of the males.

Gender Differences among Poor or Struggling Readers

Another concern that arises as one learns more about gender and reading performances involves the relationship between gender and the number of students who are identified as poor or struggling readers. Chiu and McBride-Chang (2006) conducted a reading study among 15-year-olds who lived in 43 different countries and they found that “In 90% of the countries, [males] were at least 50% more likely than [females] to be poor readers” (p. 351). Chiu and McBride-Chang’s study will be explained in greater detail in a later section.

In addition to Chiu’s and McBride-Chang’s (2006) results, data from four other large studies conducted in England and New Zealand also support the belief that a larger number of males than females are being identified as poor readers. The four large studies involve the Dunedin Multidisciplinary Health and Development Study which consisted of 989 individuals whose reading performances were tested between the ages of 7 and 11, the Christchurch Health and Development Study which sampled almost 900 children, the Office for National Statistics Study which involved 5,752 children between 9 and 15 years old, and The Environmental Risk
(E-Risk) Longitudinal Study that was comprised of over 2,000 pairs of twin children (Rutter, Caspi, Fergusson, Horwood, Goodman, Maughan, Moffitt, & Carroll, 2004). For each study, standardized reading and intelligence assessment tests were used to calculate students’ reading and IQ-referenced scores. The results of each of the four studies show that “reading disability is substantially more common in [males] than in [females]” (Rutter et al, p. 12). These large study findings support Chiu’s and McBride-Chang’s conclusions.

Gender Differences in Specific Reading Skills and/or Tasks

Not only have gender differences appeared in students’ general reading performances, but research has also shown that gender differences may occur in specific reading skills and/or tasks. This section of the paper will focus on explaining the results of several research studies that were conducted to explore relationships between gender and specific reading skills.

Based on the results of the 1994 Saskatchewan Literacy Assessment, Gambell and Hunter (1999) found that there was a noticeable difference between gender and reading performance. “In answering all reading questions that assessed students’ ability to gather meaning, to interpret reading, and to respond to a reading passage, male students were weaker than females” (p. 3). The assessment was given to students in grades 5, 8, and 11 and the findings were apparent at all three grade levels. The differences did not disappear by grade 11 (Gambell & Hunter). These findings suggest that the gap between students’ scores, based on gender, continue to exist as students get older.

The results of the study show that in grade five, males scored an average of 2.10 on questions that involved gathering meaning and females scored an average of 2.41 (Gambell & Hunter, 1999). On questions involving interpretation, males scored 2.65 and females scored 2.82. In relation to responding to reading, males scored 2.49 and females scored 2.85. Based on the
results from grade eight, males scored an average of 3.89 and females scored an average of 4.15 on questions that involved gathering meaning. While interpreting, males scored 3.19 and females scored 3.73. In relation to responding to reading, males scored 3.58 and females scored 3.90. According to the eleventh grade results, males scored an average of 3.04 and females scored an average of 3.26 on interpretation questions. In relation to responding to reading, males scored 2.66 and females scored 2.91. These findings show that females appear to score higher than males on comprehension, reading response, and inference related questions.

Gender differences have also appeared between individuals’ phonological processing ability and activation that occurs within their brains. In a study to learn more about the functional organization of the brain for language, researchers used echo-planar functional magnetic resonance imaging (MRI) to study 38 participants during orthographic (letter recognition), phonological (rhyme), and semantic (semantic category) tasks (Shaywitz, Shaywitz, Pugh, Constable, Skudlarski, Fulbright, Bronen, Fletcher, Shankweiler, Katz, & Gores, 1994). The researchers found that “During phonological tasks, brain activation in males is lateralized to the left inferior frontal gyrus regions; in females the pattern of activation is very different, engaging more diffuse neural systems that involve both the left and right inferior frontal gyrus” (p. 1). These data support the idea that during phonological tasks, females’ brains are activated in both the left and right hemispheres, whereas males’ brains tend to be activated only in the left hemisphere. This activation may affect students’ performance on such phonological processing tasks and/or skills.

Assessment measures students’ comprehension skills. According to the data, every year, females scored higher in all three grade levels on the assessment. By twelfth grade, females scored even higher on the reading assessments, suggesting that the gap between male and female reading performance gets larger as students progress through each grade level (Kleckler).

In comparison, Chiu’s and McBride-Chang’s (2006) study of students reading abilities within 43 different countries also focused on students’ ability to complete a reading comprehension test and a questionnaire. After analyzing students’ responses to the comprehension questions, Chiu and McBride-Chang found that, “In every country, [females] outscored [males]” (p. 331). These results show that gender differences, in relation to reading comprehension, are widespread around the world.

Similarly, Phillips, Norris, Osmond, and Maynard (2002) examined students’ reading achievement. They conducted a longitudinal study that evaluated 187 students’ reading achievement scores as they moved from grade one to grade six. Based on students’ scores at each grade level, Phillips et al categorized students into three categories: below-average, average, or above-average, based on their scores on the Gates-MacGinitie Reading Test (MacGinitie, Kamons, Kowalski, MacGinitie, & MacKay, 1980). After reviewing students’ scores in grades one, two, and three, Philips et al found that a larger number of males were in the below-average category and lower proportions of males were in the average and above-average categories. The data also showed that, “Performance at the end of fourth grade marked a qualitative difference in the comparison between [males’] and [females’] reading achievement. There were no systematic relationships between gender and reading category at the end of fourth grade” (Philips et al, 2002, p. 5). This statement means that at the fourth grade level, there did not appear to be significant differences between males’ and females’ reading scores. Interestingly, even though
they found that the number of males in the below-average category stayed the same at the fourth grade level, the number of females in the below-average category almost doubled (Philips et al., 2002). These statistics show that something may have occurred or affected gender differences in students’ reading performance at the fourth grade level.

Another skill or task that has been researched involves the process of looking at students’ ability to read and respond to various types of text. In a study that was designed to explore differences among students’ literacy achievement while reading expository, narrative, and document texts between the ages of 9 and 14 years old, Elley (1992) found that not only did females have higher overall reading scores than males, but that females were also ahead of males in narrative and expository reading. Elley uses the term narrative to describe texts in which the author’s goal is to tell a story. Narrative texts can be fact or fiction. On the other hand, Elley uses the term expository to describe texts that have been written to inform a reader about factual information. The term documents is used to describe information that is portrayed in charts, graphs, maps, lists, and/or tables. Documents require the reader to look for facts and information without having to read every single word (Elley, 1992).

Even though females appeared to outscore males in narrative and expository readings, there were barely any differences in students’ ability to read and explain documents. Elley (1992) even found that in six countries (Germany, France, the Netherlands, Switzerland, Spain, and the United States) that the average scores on documents for males were slightly higher than the females’ scores.

Likewise, in a study that was designed to help identify a relationship between gender differences and reading performance across countries, Rosen (2001) also decided to analyze students’ performance and/or responses on expository and narrative items and documents. Rosen
uses the term documents to describe items that require a student to use and interpret maps, tables, charts, and graphs. The data used by Rosen were collected during 1990/1991 by the International Association for the Evaluation of Educational Achievement (IEA). This study examined reading performances of 9 and 14 year olds. After analyzing students’ responses and scores from reading assessments, Rosen found that females did better on expository and narrative item questions than males, which supports the data that was collected by Elley (1992). Similar to Elley, Rosen found that on document passages, males tend to do better than females and that the difference favors males even more across time.

Another gender difference appeared in Pomplun’s and Sundbye’s (1999) study that focused on comparing or finding a relationship between gender differences and constructed response reading items on Kansas’ state assessments. Responses from students in grades 7 and 10 were used to collect and analyze the data. After analyzing students’ responses to the test items, Pomplun and Sundbye found that “Female students do better relative to male students on the constructed response format in comparison to the objective format” (p. 101). This information shows that female students may score higher on reading questions that allow them to create a written response after reading, but on the other hand, males tend to score higher on questions that are provided in an objective format.

Similarly, the Ohio Reading Achievement Tests that are given to all students in grades three through eight in the state of Ohio assess students’ abilities in relation to specific skills and/or tasks. Students are assessed on their ability to respond to, analyze, and interpret information from given texts. As mentioned in previous sections, females outscored males on overall reading performance at each grade level on the Ohio Reading Achievement Tests that were given in May of 2007. The Ohio Reading Achievement Test assesses students’ skills and
abilities relating to four reading standards (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text). Questions that are designed to assess students’ skills and abilities relating to the Acquisition of Vocabulary standard encourage students to use context clues and knowledge of word parts to learn the meanings and pronunciation of new words (Ohio Department of Education, 2007b). Questions that assess students’ skills related to the Reading Process standard focus on having students summarizing, comparing, and contrasting information that they are reading to previously read material. Questions that relate to the Informational Text standard involve students recognizing and being able to use text features to summarize main ideas and information from what they have read. Lastly, according to the Ohio Department of Education (2007b), questions that are designed to assess students’ abilities related to the Literary Text standard focus on students’ abilities to describe and explain parts and specific features of texts (plot, setting, theme, character, etc.). All of these skills/tasks are assessed as a student takes the Ohio Reading Achievement Test.

Summary

Overall, historical and contemporary research findings from various studies have been described and analyzed in this chapter. All of the studies that have been mentioned share a common finding: females tend to outscore males in overall reading performance. These differences may be explained by biological and/or interest and environmental factors or influences. Research also shows that the gap between gender differences tends to get larger as students move through each grade level. Statistics suggest that more males are identified as struggling or poor readers, compared to females. On specific reading skills or tasks, it appears that females tend to score higher than males on assessments that measure comprehension. It has also been observed that females achieve higher scores on narrative and expository reading and in
inference and reader response questions. On the other hand, males appear to score significantly higher than females on objective type questions and on questions/responses that involve the interpretation of documents. In conclusion, these findings suggest that there are significant differences that may be present between gender and reading performance.
CHAPTER III. METHODS AND PROCEDURES

Research has shown that significant differences exist between an individual’s gender and his or her reading performance. The major findings show that, on average, females tend to outperform males on reading related skills/tasks and males tend to make up a larger percentage of students who are identified as poor or struggling readers. Results from the 2007 Ohio Fourth Grade Reading Achievement Test also support those findings. The statistical data show that females scored higher than males on reading, based on overall performance, at all grade levels (grades three through eight). With these findings, the current study focuses on students’ scores on specific standards (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) that are embedded and assessed within the Ohio Fourth Grade Reading Achievement Test. Given the driving question, “What is the relationship between gender and performance on the Ohio Fourth Grade Reading Achievement Test,” the purpose of the study was to examine relationships or trends that may be present between gender and one’s level of proficiency on each of the four subtest standards and the overall reading standard. This chapter will explain the methods and procedures that were used to conduct the study.

Methods

Research Design

This study was designed to examine the relationships that exist between gender and reading performance. To identify relationships that may exist between these two variables, a correlational research design was used. Students’ scores from the 2007 Ohio Fourth Grade Reading Achievement Test were collected and evaluated to determine the number of students who scored in the below proficient, proficient, or above proficient ranges on each of the four subtest standards. Students’ scores on each of the subtests were then compared, based on gender.
Students’ total scores were also examined. Similar to Rosen’s (2001) study, which focused on evaluating students’ responses and performances on expository and narrative items and documents, this study examined students’ performances, but in relation to Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text items that were presented on the Ohio Fourth Grade Reading Achievement Test. Students’ overall scale scores on the test were also identified.

Participants

The data, information, and scores that were used in the study were collected from three schools located in northwest Ohio. The Ohio Fourth Grade Reading Achievement Test was given to all fourth grade students in May of 2007. The schools chosen to participate in the study were representative of middle-class, rural communities. They were selected for the study based on convenience sampling. This means that the schools asked to participate in the study were chosen based on location, convenience, and familiarity. From these three schools, a total of 88 students’ scores (56 males and 32 females) from the 2007 Ohio Fourth Grade Reading Achievement Test were collected and analyzed for the study.

Instrumentation

The results from the 2007 Ohio Fourth Grade Reading Achievement Test were used to collect and analyze data. In May of 2007, every fourth grade student in the state of Ohio was given the Ohio Fourth Grade Reading Achievement Test. After the tests were completed, the Ohio Department of Education scored students’ tests and then provided each school with information regarding each student’s overall reading scale score, which placed students in a given performance range (Advanced, Accelerated, Proficient, Basic, and Limited) and it also provided information concerning each student’s level of proficiency (above proficient, proficient,
and below proficient) on each of the four subtest standards that were assessed on the test (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) (see Appendix A). Students’ overall reading scale scores and levels of proficiency on each of the subtests were assessed on the Ohio Fourth Grade Reading Achievement Test and were gathered and used to analyze data.

Procedures

Several steps and procedures were used in the planning and implementation of this study. First, three schools were contacted and permission to use students’ scores from the 2007 Ohio Fourth Grade Reading Achievement Test was obtained from each school’s principal. Each principal had access to his/her school’s results because the Ohio Department of Education provides every school with information regarding each student’s scores and performance on the test. To ensure that student names were not provided or visible, each principal made a copy of the students’ scores/results and covered up each student’s name. Where the student’s name would have been, each principal placed a letter “M” to show that the given student was a male or a letter “F” to show that the student was a female. After each principal granted permission and students were identified, based on gender, data collection began.

To help organize students’ scores by schools, below proficient, proficient, and above proficient males and females were identified for each of the four standard subtests (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) for each school. The numbers or statistical data for each school were entered into a database. Once the data were calculated for each school, the results of all three schools were combined to make one large sample to represent the number of males and females who were below proficient, proficient, or above proficient on each of the standard subtests in fourth grade.
In addition, each student received an overall scale score on the test, ranging from 249-431. To find the overall number of students whose scores fell within each of the performance ranges, the researcher separated students’ scores into each of the five ranges (Advanced, Accelerated, Proficient, Basic, and Limited). Once the scores were separated into those ranges, each range was split into two groups, the number of females and the number of males who scored within that range was calculated.

With the overall sample, the researcher was able to locate statistical trends, relationships, and/or significances that appeared among gender and reading performance on the specific subtests by performing chi-square tests. To locate statistical trends or relationships among gender and overall reading scores, a t-test was performed.

**Data Collection**

In January 2008, students’ scores from the 2007 Ohio Fourth Grade Reading Achievement Test were collected from three schools. The principal of each school was contacted and permission to use students’ scores from the 2007 Ohio Fourth Grade Reading Achievement Test was obtained. Before the results were collected, each principal covered up students’ names so that they were not visible; to ensure that students’ identities were protected. Once the names were covered up, each principal made a copy of the students’ scores/results and covered up each student’s name. Where the student’s name would have been, each principal placed a letter “M” to show that a given student was a male or a letter “F” to show that a student was female. Once all of the scores were collected, the number of male and female students who fell within the above proficient, proficient, and below proficient categories for each of the subtests (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) were calculated. Students’ overall reading scale scores were also identified and students were categorized into one
of five categories (Advanced, Accelerated, Proficient, Basic, and Limited), based on their scores. Students whose overall reading scale scores were 467 or higher were identified and placed within the Advanced performance range, students who scored within 435-466 were identified as being Accelerated, students who scored between 400-434 were identified as being Proficient, students who scored between 384-399 were identified as being Basic, and students who scored 383 or lower were identified and placed within the Limited performance range.

Based on data collected from each school, each student’s gender, school, total reading scale score, overall level of performance, and levels of proficiency on each of the four subtests were entered into StatCrunch, a statistical computer program. Once all of the data was entered into the program, statistical and graphic analyses of the data were completed.

Data Analysis

The statistical and graphic analyses of the data were completed by running a series of chi-square statistical tests. The number of males and females who scored in the above proficient, proficient, and below proficient ranges of performance within each standard subtest (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) were calculated by performing chi-square tests. These tests were performed to look for significant statistical differences that may have appeared between genders and reading performance, based on students’ levels of proficiency on each subtest. A t-test was then used to look for significant differences between males’ and females’ total reading scale scores.

Summary

In summary, the goal of this study was to identify areas in which significant gender differences may occur based on students’ performances on each of the four standard subtests that are assessed within the Ohio Fourth Grade Reading Achievement Test. The study was conducted
to determine whether there were specific reading related tasks, skills, or areas in which one
gender appeared to outperform the other gender when it comes to a particular reading
skill/ability. Students’ scores were obtained from three schools in northwest Ohio, which were
chosen by convenience sampling. Males’ and females’ scores were tallied and calculated by
school and then by a sample, as a whole, to determine whether there were any recognizable
trends or relationships that existed between one’s gender and his/her reading performance.
CHAPTER IV. DATA ANALYSIS AND DISCUSSION OF RESULTS

Research has shown that significant differences exist between an individual’s gender and his or her reading performance. The major findings show that, on average, females tend to outperform males on reading related skills/tasks and males tend to make up a larger percentage of students who are identified as poor or struggling readers. Results from the 2007 Ohio Fourth Grade Reading Achievement Test also support those findings (Ohio Department of Education, 2007a). The statistical data from the Achievement Tests show that females scored higher than males on the reading test, based on overall performance, at all grade levels (grades three through eight), but they do not show the number of males or females who performed at, above, or below the proficient level on the test. With this in mind, this study focused on looking at students’ scores on specific standards (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text) that are embedded and assessed within the Ohio Fourth Grade Reading Achievement Test. This chapter will discuss the findings of the study and the relationships that were discovered between gender and reading performance to help answer the major driving question, “What is the relationship between gender and performance on the Ohio Fourth Grade Reading Achievement Test?” by focusing on the following five sub questions:

1. What is the relationship between gender and performance on the Acquisition of Vocabulary standard?
2. What is the relationship between gender and performance on the Reading Process standard?
3. What is the relationship between gender and performance on the Informational Text standard?
4. What is the relationship between gender and performance on the Literary Text standard?

5. What is the relationship between gender and performance on the overall reading scores?

Data Analysis

Students’ scores from the Ohio Fourth Grade Reading Achievement Test were collected and analyzed from three different schools to determine whether significant relationships exist between gender and students’ performances on each of the four reading subtest standards (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text). A total of 88 students’ scores were analyzed (56 males and 32 females). For each standard, the number of males and females who performed at the above proficient, proficient, and below proficient levels were calculated. Chi-square tests were then used to determine the relationship and level of significance among gender and students’ level of performance on each standard. A t-test was used to look for significance between gender and overall reading scores. For all of the analyses, the alpha level .05 was used. The following paragraphs will address and describe the results that were found to help answer the five driving questions.

To answer the question, “What is the relationship between gender and performance on the Acquisition of Vocabulary standard,” a chi-square test was performed. The Acquisition of Vocabulary standard assesses students’ ability to use context clues and the knowledge of word parts to learn the meanings of words. From the data that were collected, the number of males and females who scored above, at, and below the proficient levels on the Acquisition of Vocabulary standard are represented in Table 1. Based on the results of the chi-square test, it appears that there were no significant relationships between males and females’ scores, $X^2(2, N = 88) = 0.82,$
\[ p = .66, \] which means that the males and females from this sample appear to have performed similar to one another.

Table 1

\textit{Number of Males and Females at Each Proficiency Level for the Acquisition of Vocabulary Standard.}

<table>
<thead>
<tr>
<th>Gender</th>
<th>Above Proficient</th>
<th>Proficient</th>
<th>Below Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

The same procedure that was used for interpreting the results for the Acquisition of Vocabulary standard were also used to answer the question, “What is the relationship between gender and performance on the Reading Process standard?” The Reading Process standard focuses on students’ ability to summarize, compare, and contrast information that they have read to previously read material. The total number of males and females who scored above, at, or below the proficient level on the Reading Process standard are identified in Table 2. The results from the chi-square test suggest that there were no significant relationships between males and females’ scores on the Reading Process standard, \( \chi^2(2, N = 88) = 0.83, p = .66 \), which means that the males and females from this sample also appear to have scored similar to one another.

Table 2

\textit{Number of Males and Females at Each Proficiency Level for the Reading Process Standard.}

<table>
<thead>
<tr>
<th>Gender</th>
<th>Above Proficient</th>
<th>Proficient</th>
<th>Below Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>
To answer the question, “What is the relationship between gender and performance on the Informational Text standard,” another chi-square test was performed. The Informational Text standard focuses on students’ abilities to recognize text features from graphs, diagrams, and charts to summarize main points or ideas and to state examples of cause and effect. The number of males and females who performed above, at, or below the proficient level on the Informational Text standard are shown in Table 3. The results from the chi-square test show that there was a significant relationship between male and females’ scores on the Informational Text standard, \(X^2(2, N = 88) = 8.57, p = .01\), which means that the males and females from this sample performed significantly different from one another. The results show that more than two times the amount of females scored within the below proficient level, when compared to the number of males who scored within that range.

Table 3

*Number of Males and Females at Each Proficiency Level for the Informational Text Standard*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Above Proficient</th>
<th>Proficient</th>
<th>Below Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>33</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

To answer the question, “What is the relationship between gender and performance on the Literary Text standard,” another chi-square test was performed. The Literary Text standard assesses students’ abilities in recognizing and describing parts of a story and explaining different features of various texts. The number of males and females who performed above, at, and below the proficient levels on the Literary Text standard are portrayed in Table 4. Based on the results
of the chi-square test, it appears that there were no significant relationships between males’ and females’ scores on this standard, $X^2(2, N = 88) = .12, p = .94$. This means that males and females appeared to score similar to one another.

Table 4

*Number of Males and Females at Each Proficiency Level for the Literary Text Standard*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Above Proficient</th>
<th>Proficient</th>
<th>Below Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>43</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

To answer the question, “What is the relationship between gender and performance on the overall reading scores,” a t-test was performed to see if significant relationships existed. A t-test is used to determine whether there are significant differences between a categorical variable (gender) and a quantitative variable (numerical score value) by analyzing the differences in mean scores. The results from the t-test showed that there were no significant differences between gender and overall reading scores, $t(86) = .01, p = .99$ (two-tailed). The males’ and females’ mean scores were almost exactly the same. The mean score for the males was 428.86 and the mean score for females was 428.78. Even though the mean scores were almost the same, males’ scores were more spread out. The male scores represented both extreme ends of the spectrum. The lowest overall reading scale score was a male and the highest overall score was a male. The females’ scores appeared to stay within a limited range.

**Discussion of Results**

What is the relationship between gender and performance on the Ohio Fourth Grade Reading Achievement Test and the four subtest standards? The statistical findings from the study
sample appear to indicate that the only significant relationship that occurred between genders on a specific subtest was within the Informational Text standard, where males appeared to excel and females appeared to struggle. This finding supports the research that suggests that males prefer reading informational and authentic texts and females prefer and do well while reading narrative texts (Elley, 1992; Gambell & Hunter, 2000). It also supports Elley’s (1992) and Rosen’s (2001) findings that have shown that males tend to do better than females on reading related tasks/skills that involve the interpretation of documents. As it was mentioned before, the Informational Text standard focuses on students’ abilities to recognize text features from graphs, diagrams, and charts to summarize main points or ideas and to state examples of cause and effect, which can be placed into the category of documents.

The data from this sample suggest that there were no significant relationships between male and females’ overall reading scores. This data may not show the true differences that exist between the two genders because t-tests are designed to compare the differences between the sample means. This means that the t-test does not focus on or take into consideration the difference between extreme or varying scores. For example, as the data shows, males’ scores were more spread out and they represented the two extreme scores (highest and lowest scores), whereas females’ scores were closer together and tended to fall within a given range. By running a t-test, it is difficult to see these differences because the test will only compare the mean scores of each gender. In this study, the two extreme scores were representative of males, which also supports and reinforces Pressey’s (1918) findings.

Also, another argument that could be made about there not being significant relationships between gender and the standards/overall scores in this study could be that the sample was representative of fourth grade students’ scores. As it was briefly mentioned in chapter one, an
interesting trend, also known as the fourth grade slump, has been observed in fourth grade students’ reading scores. This decline in males’ and females’ scores may have accounted for the male and female students scoring similar to one another on the standards and overall test. The findings from the present study also support Phillips’, Norris’, Osmond’s, and Maynard’s (2002) findings that showed that at grade four, no significant differences were found between genders and reading achievement, even though differences were identified in grades one through three.

Summary

In conclusion, it appears that in the state of Ohio, females outperformed males on overall reading scores from the 2007 Ohio Fourth Grade Reading Achievement Test (Ohio Department of Education, 2007a). The Ohio Department of Education does not provide statistics on the number of males and females who performed at each proficiency level on each of the four standards that were assessed (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text); therefore this study was designed to seek relationships that may have been present between gender and the four standards and gender compared to students’ overall reading scores.

Based on the results of a series of chi-square tests and t-tests that were performed, the only significant relationships or differences that were found between gender and reading performance in this study occurred within the Informational Text standard. It appears that more than two times the number females fell within the below proficient range on the Informational Text standard, when compared to the number of males. This finding suggests that there may be significant differences between what males and females prefer to read and what books are introduced and provided for students to read within the classroom. Also, by looking at the students’ overall reading scores, it appears that the males’ scores were more spread out and the
two extreme end scores (highest and lowest scores) were males, whereas females’ scores were more close together.

Even though no significant relationships were found between gender and overall reading performance, significance may not have been found due to a trend of declining reading scores among males and females in fourth grade. With the results from this study, the numbers of students who performed above, at, or below the proficient level on each of the subtest standards can be identified and teachers are better able to differentiate or plan instruction to meet the needs of individual students.
CHAPTER V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Reading has become a major concern in the eyes of educators, administrators, parents, politicians, and other stakeholders. Given that a large emphasis is being placed on reading, state and national high-stakes tests are being given to children at almost every grade level to assess their abilities and/or level of proficiency on reading related skills/tasks. The results from the tests can be used to identify a child’s overall performance and/or his or her ability to perform and understand a variety of specific reading related skills or tasks. A student’s score or performance on the test can also be used to make vital decisions regarding his/her current abilities, needs, and/or progression to the next grade.

The results from the Ohio Fourth Grade Reading Achievement Test from May of 2007 show that females outperformed males on overall reading performance at all grade levels (three through eight) on the test (Ohio Department of Education, 2007a). Based on these results, one may wonder where or if relationships exist between gender and specific areas of the test and how the results may aid teachers in recognizing and further developing students’ strengths and weaknesses related to reading. This chapter will provide information from research that was undertaken to investigate the current relationship between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test by looking at students’ overall scores and their levels of proficiency on each of the reading standards that were assessed on the test (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text).

Summary

Once all fourth grade students have taken the Ohio Fourth Grade Reading Achievement Test, the Ohio Department of Education provides data to show how students performed state-wide, district-wide, school-wide, and class-wide. These results show how students performed
overall on the test and the percentages of males and females who were proficient or above proficient on the test, but they do not show the percentage of males and females who scored above, at, or below the proficient levels on each of the standards that were assessed (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text). That information led to the question, What is the relationship between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test?” and then focused on the following five sub questions:

1. What is the relationship between gender and performance on the Acquisition of Vocabulary standard?
2. What is the relationship between gender and performance on the Reading Process standard?
3. What is the relationship between gender and performance on the Informational Text standard?
4. What is the relationship between gender and performance on the Literary Text standard?
5. What is the relationship between gender and performance on the overall reading scores?

The purpose of the study was to look for relationships that may exist between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test by looking at students’ levels of proficiency on each of the four standards that were embedded within the test.

According to assessments and various research studies, females appear to be outperforming males on overall performance on reading-related tests (Gambell & Hunter, 1999; Gates 1961; Kleckler, 2006; Ohio Department of Education, 2007a; Pressey 1918; ). Other
research (Chiu & McBride-Chang, 2006; Rutter, Caspi, Fergusson, Horwood, Goodman, Maughan, Moffitt, & Carooll, 2004) has shown that more males tend to be identified as poor or struggling readers when compared to females and that males’ scores tend to fall within extreme score ranges (high and low), whereas females’ scores tend to fall within a normal range (Pressey, 1918). There are two major theoretical arguments that may account for the differences that have been identified between gender and reading performance. The first theory suggests that biological or maturational factors between genders may affect students’ reading skills and abilities (Elley, 1992; Halpern 1997; Sax, 2002; Spence, 2007). On the other hand, the other theory that has been used to explain these differences focuses on students’ interests and environmental factors that may affect reading. Significant differences have been identified between the types of books that males and females read (Coles & Hall, 2002; Gambell & Hunter, 1999; Spence, 2007) and the motivation and amount of time that each gender spends reading (Coles & Hall, 2002; McKenna, Kear, Randolph, & Ellsworth, 1995). A teacher’s gender may also impact students’ learning, based on the types of books and texts that he/she provides and exposes students to on a daily basis (Murisuo-Storm, 2006).

Differences have also been identified between gender and specific reading skills/tasks related to comprehension and phonological processing (Elley, 1992; Gambell & Hunter, 1999; Kleckler, 2006; Phillips, Norris, Osmond, & Maynard, 2002; Shaywitz, Shaywitz, Pugh, Constable, Skudlarski, Fulbright, Bronen, Fletcher, Shankweiler, Katz, & Gores, 1994). These differences also appear to support the other research findings that suggest females outperform males on overall reading performance. In Phillips’, Norris’, Osmond’s, and Maynard’s (2002) longitudinal study, it was found that a larger number of males were placed within the below-average category and lower proportions of males were in the average and above-average
categories when compared to females. Phillips et al also found that females appeared to outscore males on the test in grades one through three, but at the end of fourth grade, “There were no systematic relationships between gender and reading” (p. 5). This finding suggests that something may have occurred or affected gender differences in students’ reading performance at the fourth grade level.

In addition to examining differences between gender and specific reading skills, Elley (1992) and Rosen (2001) decided to explore students’ performance on different types of readings. Both Elley and Rosen found that females appeared to outscore males in narrative and expository readings, but males appeared to outperform females while reading and explaining documents. In addition to looking at the types of texts read and students’ gender, Pomplun and Sundbye (1999) found that females tend to score higher on reading questions that allow them to create a written response after reading, but that males tend to score higher on questions that are provided in an objective format. All in all, significant relationships and differences have been identified between gender and reading performance and reading related skills/tasks. The focus of the present study was to look for gender differences among students’ overall reading scores and levels of proficiency on each of the subtest standards that were present within the Ohio Fourth Grade Reading Achievement Test.

Conclusions

The findings from the study sample show that the only significant relationship that occurred between gender and a specific standard was in the Informational Text standard, where males appeared to outperform the females. This finding supports the research that suggests that males prefer reading informational and authentic texts and females prefer and do well while reading narrative texts (Elley, 1992, Gambell & Hunter, 2000) because the Informational Text
standard assesses students’ abilities to use diagrams, charts, graphs, and other headings to summarize main points and ideas from a variety of texts. The results from the study also support Elley’s (1992) and Rosen’s (2001) findings that have shown that males tend to do better than females on reading related tasks/skills that involve the interpretation of documents. As it was mentioned before, the Informational Text standard focuses on students’ abilities to recognize text features from graphs, diagrams, and charts to summarize main points or ideas and to state examples of cause and effect, which can also be classified into the domain of documents.

The data from the study sample suggest that there were no significant relationships between male and females’ overall reading scores, even though a relationship was present among males and females throughout the entire state of Ohio. The data from the study may not have shown the true differences that existed between the two genders in the sample because t-tests are designed to compare the differences between the sample means. This means that the t-test does not focus on or take into consideration the difference between extreme or varying scores. For example, as the data shows, males’ scores were more spread out and they represented the two extreme scores (highest and lowest scores), whereas females’ scores were closer together and tended to fall within a given range. With a t-test, it is difficult to see these differences because a t-test only compares the means of each gender. In this study, the two extreme scores were representative of males, which also supports and reinforces Pressey’s (1918) findings.

Also, another argument that could be made about the lack of significant differences between gender and the standards/overall scores in the study could be that the sample was representative of fourth grade students’ scores. As it was briefly mentioned in chapter one and four, an interesting trend, also known as the fourth grade slump, has been observed in fourth grade students’ reading scores. The decline in males’ and females’ scores may have accounted
for the male and female students scoring similar to one another on the standards and overall test. These findings also support Phillips’, Norris’, Osmond’s, and Maynard’s (2002) findings that showed that at grade four, no significant differences were found between gender and reading achievement, even though differences were identified in grades one through three. By taking the time to observe trends and/or relationships that may exist between students’ performances/scores on different areas of reading tests and by becoming more aware of these differences, teachers are better able to provide reading instruction that encompasses a variety of learning styles and that supports all students’ needs, interests, and learning within the classroom.

Recommendations

Recommendations for Teachers

With national and state high-stakes testing on the rise, it is important for teachers to ensure that they are teaching and providing their students with opportunities to explore, reinforce, and learn skills estratégias related to reading that they will use on a daily basis and that they may be assessed on while taking state and national tests. To provide reading instruction that meets students’ needs, teachers can use the results of high-stakes tests and other reading assessments to look for areas of strength or weakness to help further develop students’ reading skills/abilities. Differences can be observed by looking at students’ individual scores or by looking at levels of performance among a group of students within the classroom. In the present study, students’ overall performance and levels of proficiency from the Ohio Fourth Grade Reading Achievement Test were used to look for trends or relationships that may have existed between males’ and females’ scores. From the findings, classroom activities and experiences can be developed and adapted to help support and reinforce specific skills/strategies that were identified on the test and that focus on students’ interests within the classroom.
Based on the research and findings that were presented in chapters 1, 2, 3, and 4 of this paper, if teachers are going to attempt to motivate and aid students to become successful readers, it is important for them to use a variety of assessments, instructional materials, and to provide and expose students to multiple texts and genres of books within the classroom. By exposing students to multiple texts and genres of books, students are given an opportunity to explore and understand the skills that are associated with reading different types of texts. When choosing reading materials for the classroom, it is important for teachers to take into consideration students’ interests and abilities. As it was mentioned in chapter two, research has shown that males and females appear to read different kinds of texts (Coles & Hall, 2002; Gambell & Hunter, 1999; Spence, 2007). Due to those differences, it is necessary to provide a variety of texts within the classroom and to encourage students to choose the books that they want to read on their own. By exposing students to a variety of books, teachers can also avoid the theory or idea that suggests that a teacher’s gender may influence gender differences among reading, based upon the types of texts that he/she chooses to read and provide to students within the classroom (Murisuo-Storm, 2006).

According to the results from the present study, it appears that males tend to do better than females on the Informational Text standard that is assessed on the Ohio Fourth Grade Reading Achievement Test. That standard focuses on students’ abilities to interpret and summarize information from a variety of sources by analyzing diagrams, graphs, and other visual representations. To aid and help further develop females’ skills in this area, teachers first need to identify the reason(s) as to why the females may have struggled on that portion of the test. Did the females do poorly because they did not understand how to interpret information from the passages that were provided on the test or do the females not enjoy reading informational texts?
Once a teacher identifies the reason(s), he/she is then able to adapt his/her instruction. If the females do poorly because they do not understand how to interpret information from informational texts, a teacher can model strategies within the classroom that will help them learn how to interpret and gather information. On the other hand, if females do poorly on the test because they do not enjoy reading informational texts, teachers can introduce and encourage females to read informational texts by providing them with news articles, magazines, and/or any other informational texts that relate to their individual interests. If females are given an opportunity to read informational texts that relate to their individual interests, they may become more interested and willing to read informational texts on their own. If this occurs, females’ scores on the Informational Text standard may improve.

Accordingly, even though the data from the current study did not show significant differences between gender and the other three standards that were assessed on the test, it is still apparent that females are outperforming males on the Ohio Fourth Grade Reading Achievement Test, based on overall performance in the state of Ohio. Seeing that males outscored females on the Informational Text standard within the current study, teachers could use the males’ strengths in that area to build upon other reading standards (Acquisition of Vocabulary, Reading Process, and Literary Text) that are assessed on the test. For example, teachers could incorporate the reading of informational texts within lessons and activities to teach the students, especially the males, how to further develop other reading related skills. Reading related skills that are included in the Reading Process, Acquisition of Vocabulary, and Literary Text standards can be taught to students while using a variety of texts and materials.

Another recommendation for teachers could be to provide more informational texts within their classroom libraries and to use those texts to introduce concepts or ideas that will be
studied and integrated into other content areas (math, science, social studies, etc.). Also, by providing more informational texts in classrooms, males may be motivated to read more because they would have opportunities to choose and read books that interest them, which could then impact their reading performance.

Furthermore, the focus of the study was to look for relationships between gender and reading performance on the Ohio Fourth Grade Reading Achievement Test. Even though significant differences between gender and the three other standards that were assessed on the test were not identified, it does not mean that teachers cannot use the information and results that they receive from the test to help plan and differentiate instruction to meet the needs of individual students within their class. Overall, teachers should take the time to look at their students’ performance and levels of proficiency on previous and current assessments to plan for future instruction and to help further develop students’ reading abilities.

**Recommendations for Teacher Educators**

Based on the information that has been provided, teacher educators should encourage pre-service teachers to be aware of their students’ strengths, weaknesses, interests, and individual differences. In relation to the current study, it is important for pre-service teachers to be aware of gender differences and how one’s gender may affect his/her reading and learning. Given that no two students are the same and not all males and/or females enjoy reading the same kinds of texts, it is important for teachers to recognize differences that may be present among their students and to not stereotype or over generalize the types of texts and/or materials that a specific gender may want to read. With this in mind, teacher educators can encourage their pre-service teachers to introduce and supply a wide range of texts for students to read within the classroom. This would
provide students with opportunities to choose books that interest them, which may help increase their motivation to read and succeed while completing specific reading skills and/or tasks.

Recommendations for Future Research

A recommendation that could be used to guide future research related to this topic could involve a researcher using a larger sample of students and a wide variety of schools from different areas around the state. The sample that was used in the present study only reviewed 88 students’ scores from schools that are located close to one another in northwest Ohio. With a larger sample and a more diverse sample of schools, identifiable trends or relationships may become more observable.

Similarly, future research could also focus on performing a longitudinal study that would look at gender differences in relation to reading performance. The study could observe trends or relationships that may exist over a long period of time (third, fourth, fifth, sixth, seventh, and eighth grades). The findings from that study could also help researchers and other educators learn more about the fourth grade slump and/or any other trends that may appear throughout time in relation to students’ reading abilities and performances on the Ohio Reading Achievement Tests.

Also, to help further investigate students’ strengths and weaknesses in relation to gender and reading performance, future research could look at the types of questions that are asked on the test (objective or constructed response) and the relationships between gender and the types of questions that students missed. It would be interesting to see if an observable relationship exists between gender and students’ performances on the various types of questions that are provided on the test based on research that has shown that males appear to excel on objective types of questions and females seem to excel on questions that require a constructed response (Pomplun
& Sundbye, 1999). If differences were identified based on gender and types of questions asked, educators and other professionals could also plan instruction to further develop students’ skills in responding to reading in a variety of ways.

**Summary**

In conclusion, a large emphasis is being placed on students’ reading skills/abilities and reading instruction within classrooms. To inform educators, politicians, administrators, and other stakeholders about students’ abilities, high-stakes tests are being given to students all over the United States. In the state of Ohio, students are given the Ohio Reading Achievement Test in grades three through eight, to assess their abilities on four major standards that are presented within Ohio’s Academic Content Standards that focus on specific skills that students are expected to be taught within a given grade (Acquisition of Vocabulary, Reading Process, Informational Text, and Literary Text).

Based on students’ performances on the test, educators and administrators are able to look at students’ areas of strengths and/or weaknesses to help them plan and differentiate instruction to meet the needs of their students. At the state, district, and school-wide levels, observable trends and relationships can also be identified. In the state of Ohio, the results from the Ohio Reading Achievement Tests show that females outscored males based on overall reading scores. Other historical and contemporary research studies have also found similar results that support those findings. The present study was created to look for significant differences between gender and reading performance among fourth grade students’ levels of proficiency on each of the four standards that make up the Ohio Reading Achievement Test. The only significant relationship that was found occurred in the Informational Text Standard, where males appeared to outperform the females. As these differences appear throughout various
research studies, there are many theories and/or explanations that could be given to explain how and why the differences may have occurred.

Even though there is no one correct explanation for gender differences that may appear between students’ reading abilities and performances, it is important for teachers, parents, and other professionals to be aware of possible explanations for the differences and to make sure that they are doing everything that they can to accommodate and promote students’ learning both in and outside of the classroom. This can be done by identifying individual students’ strengths, weaknesses, interests, and motivation toward reading and by exposing students to an assortment of texts and reading materials in which a variety of strategies and skills can be taught and modeled to help students comprehend the texts.
References


APPENDIX A

SAMPLE DATA SHEET OF FOURTH GRADe STUDENTS’ RESULTS FROM THE 2007
OHIo FOURTH GRADE READING ACHIEVEMENT TEST
This roster shows each student's proficiency on each content standard. The symbols indicate if a student performed above, below or near the proficient level for each content standard. This roster also groups students by their overall performance level by placing the student in one of the five performance level categories (i.e., Advanced, Accelerated, Proficient, Basic, Limited).

**LEGEND:**  
+ Above Proficient  
= Near Proficient  
= Below Proficient

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<th>Student Name</th>
<th>Reading Scale Score</th>
<th>Acquisition of Vocabulary</th>
<th>Reading Process</th>
<th>Informational Text</th>
<th>Literary Text</th>
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<td></td>
<td></td>
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<tr>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
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<td>=</td>
<td>+</td>
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<td>+</td>
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<tr>
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<td>384</td>
<td>=</td>
<td>=</td>
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<td>+</td>
</tr>
</tbody>
</table>

**Standard Error of the Scale Score at the:**
- Normal Cut Score 12
- Advanced Cut Score 9
- Proficient Cut Score 9
- Basic Cut Score 9

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