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UNIVERSITY OF CALIFORNIA
SANTA CRUZ
**ANIMAL-ASSISTED LITERACY INSTRUCTION
FOR STUDENTS WITH IDENTIFIED LEARNING DISABILITIES:
EXAMINING THE EFFECTS OF INCORPORATING A THERAPY DOG
INTO GUIDED ORAL READING SESSIONS**

A dissertation submitted in partial satisfaction

of the requirement for the degree of

DOCTOR OF EDUCATION

in

COLLABORATIVE LEADERSHIP

by

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September 2013

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ABSTRACT

**Animal-Assisted Literacy Instruction for Students
With Identified Learning Disabilities: Examining the Effects
of Incorporating a Therapy Dog into Guided Oral Reading Sessions**

by Wendy Abigail Treat

Literacy acquisition is imperative to successful academic progress and to successful participation in our society. Students with identified learning disabilities are often among those who struggle to acquire literacy skills. The following dissertation shares the results of a reading intervention study in which nine students with identified learning disabilities practiced guided oral reading with the researcher-teacher in the presence of a certified therapy dog. There were 10 reading sessions, each lasting 10-15 minutes. A matched group of eight students with identified learning disabilities practiced guided oral reading with the researcher-teacher but did not have the therapy dog present during the reading sessions. Achievement data were collected through pre- and post-testing on the Gray Oral Reading Test (GORT-4) and the Basic Reading Inventory (BRI), which is a locally used assessment of reading skills. Measures to assess changes in student's feelings of self-efficacy and anxiety about reading included the Reader Self-Perception Scale (RSPS) and an anxiety scale. Pre- and post-intervention interviews, parent questionnaires and reading journals provided additional data. The results indicate that students who participated in the intervention demonstrated statistically significant increases in reading skills. In

addition, the results suggest that reading in the presence of a therapy dog increases feelings of self-efficacy, decreases anxiety and increases students' motivation to read. The final section of this dissertation explores a range of explanations for the effectiveness of incorporating a therapy dog into guided oral reading sessions and includes a discussion of the contexts in which animals, including certified therapy dogs, may be utilized in special education instruction to support academic progress for students with identified learning disabilities.



Kela, Certified Therapy Dog, With Student During Guided Oral Reading

DEDICATION AND ACKNOWLEDGEMENTS

This dissertation is dedicated to Kela, my gentle, loving, wonderfully patient therapy dog. Without her, this study would not have been possible. It is also dedicated to all children who have struggled with reading and whose lives may be changed for the better by the listening ear and the soothing presence of a furred or feathered friend.

Acknowledgements

I want to acknowledge the children who participated in this study for their gentleness with Kela, their diligent efforts to improve their reading and the joy they brought to me as they discovered the joy of reading. The following acknowledgement of Kela's help with this was written by a student who participated in the intervention:

"Reading with Kela helped me read faster, better and to read harder books. First I was slow but now I'm fast. Kela is like my friend and I'm not scared with my friend so I'm not scared to read to Kela. I read better because I have a stronger voice and why I have a stronger voice is I read stronger because I want Kela to hear and I feel that Kela is near me so that's why I read really loud now even when Kela is not there. See what Kela has done to help me!"

- Student #4, 6/13/2013

I would also like to acknowledge my former principal at Kamali'i Elementary School in Hawaii, Sandra Shawhan. Her support of my use of animals in the classroom inspired my desire to research animal-assisted instruction. And I would like to acknowledge my Dissertation Committee: my adviser, Kip Tellez, PhD for unfailing belief in my study, Lucinda Pease-Alvarez, PhD for wise feedback and Susan Leigh Flinspach, PhD for dedicated mentoring and guidance.

CHAPTER 1:

INTRODUCTION

"Literacy" has been defined as print-based skills, as school knowledge and as a social-cultural construct (Cushman, Kintgen, Kroll & Rose, 2001). Literacy instruction may encompass all of these definitions. Informal literacy instruction begins in the home and community via engagement with the language, sounds and practices of the specific social-cultural environment within which the child exists. It includes learning "ways with words" (Gee, 2003, p. 30) that are rooted in home or community-based discourses. These culturally specific discourses provide the foundation for literacy, which is built upon when formal literacy instruction begins. Formal literacy instruction, once thought to begin in kindergarten, is now thought to begin much earlier (Neuman & Dickinson, 2003, Gee, 2003, Whitehurst & Lonigan, 2003), as children learn letter names and sounds and become familiar with books in the home as well as in the preschool setting. However, for the purposes of this dissertation, "literacy instruction" refers to formal literacy instruction provided in a classroom setting.

The study documented in this dissertation examines the effects of an instructional intervention designed to improve the literacy skills of students with identified learning disabilities. This introductory chapter includes a statement of the problem, a description of animal-assisted interventions, the purpose and significance of this research and a set of key terms and acronyms used in the dissertation.

Statement of the Problem

Due to the importance of reading as a foundational academic skill, state and federal standards include expectancies for reading from kindergarten through twelfth grade. Standards for each grade level build upon skills taught in the previous grade levels. By the sixth grade, basic reading skills are expected to be mastered. The standards for reading in grades six through twelve are presented under the headings Literacy in History/Social Studies, Science and Technical Subjects, Reading Informational Texts, and Reading Literature (Common Core Standards, 2012). In grades six through twelve, students are expected to apply the basic reading skills they learned in kindergarten through fifth grades to the reading of core curriculum material. The expectation is that they can read texts and supplemental materials for social studies, science and math (reading the text book as well as directions and problems on assignments and tests), and grade-level literature. Research indicates that students who do not make adequate progress in learning basic reading skills in the early grades have difficulty accessing such core curriculum texts and supplemental materials, and often struggle to work at grade-level in all academic areas (Guthrie, Perencevich, Wigfield, Taboada, Humenick & Barboa 2006, Guthrie 2004, Whitehurst & Lonigan, 2003, Wigfield, Guthrie & McGough, 1996).

Among those students who struggle to meet grade-level reading standards are children who receive special education due to identified learning disabilities which impact their acquisition of literacy skills. For these students, the instruction they have received in their general education classes has not resulted in the acquisition of grade-

level literacy skills. Testing (usually done by a school psychologist) has determined that their academic challenges are due to identified learning disabilities. For children with identified learning disabilities, the teaching of literacy skills does not necessarily result in the acquisition of literacy skills that meet grade-level expectations. In spite of a solid knowledge of sound-symbol relationships, children with identified specific learning disabilities often mis-perceive the letters or letter sequencing within words and so have difficulty decoding (Singleton, 2005). Placement in special education provides these students with specialized academic instruction with the goal of increasing their literacy skills so they can access the core curriculum and eventually meet grade-level standards in all academic areas. The specialized literacy instruction offered to students who receive special education support is based upon students' assessed areas of need. According to the assessments and depending on the students' ages and grade-levels, instruction usually includes a review of phonemic awareness, phonetic decoding of words, practice in sound sequencing within words, sight-word recognition, vocabulary-building and lessons focusing on building reading fluency and reading comprehension (Berkeley, Scruggs & Mastropieri, 2010, Frager & Rye, 2010).

Research has confirmed oral reading and repeated reading as strategies that support reading fluency and comprehension, especially for students who have difficulty acquiring reading skills (Algozzine, Marr, Kavel & Dugan, 2009, Kesler, 2010, Rasinsk & Hoffman, 2003). Although research has shown "round robin" oral reading is not effective (Rasinsk & Hoffman, 2003), both Guided Oral Reading and

Peer-Assisted Oral Reading, where students read one-to-one with an adult or peer, have been found to be effective in increasing reading fluency and comprehension (Algozzine et al., 2009, Scull, 2010, Idol, 2010, Katz & Carlisle, 2009, Kesler, 2010, Rasinsk & Hoffman, 2003, Magno, 2010, Zbornik, 2001). One of the factors noted by researchers as promoting reading fluency is the opportunity to read a text more than once. Repeat-reading contributes to gains in confidence as well as fluency in oral reading (Algozzine et al., 2009, Idol, 2010).

However, students with identified learning disabilities that affect their acquisition of literacy skills often experience anxiety when they engage in literacy activities, particularly when those activities include oral reading (Carrol & Iles, 2006, Lynch 2006, Zbornik, 2001). Carrol & Iles (2006) have shown that anxiety levels in students with identified learning disabilities are greater than the levels of anxiety experienced by students who do not have identified learning disabilities. Their findings support the assumption that years of repeated struggles with reading "will have disposed dyslexics to feel signs of stress, worry and anxiety when placed in a situation demanding literacy accuracy" (Carrol & Iles, 2006, p. 657). Research has shown that anxiety while reading leads to a decrease in comprehension even when students are reading silently. Students with high anxiety levels scored significantly lower on reading comprehension measures than students with low- and medium-levels of anxiety (Neville, Pfof & Dobbs, 1967).

Anxiety while reading not only affects reading comprehension at the time of reading, but it also creates an "unpleasant emotional reaction towards reading" (Magno, 2010, p. 96). This can cause students with identified learning disabilities to read less (both orally and silently) than their peers who do not have identified learning disabilities, because they want to avoid an activity that generates an unpleasant emotional reaction. An aversion to reading is problematic. Studies have shown that reading comprehension is linked to the amount of reading that is done, whether the reading is silent or oral (Guthrie, 2004, Guthrie et al., 2006, Whitehurst & Lonigan, 2003, Wigfield & Guthrie, 1997). Students who read more score higher on reading comprehension measures (Guthrie, 2004, Guthrie et al., 2006, Wigfield & Guthrie, 1997). However, students who experience difficulty in acquiring literacy skills are not motivated to engage in reading or other academic activities that require reading (Guthrie, 2004, Guthrie et al., 2006, Schunk & Pajares, 1997, Whitehurst & Lonigan, 2003, Wigfield & Guthrie, 1997, Wigfield et. al., 1996). This lack of motivation to read leads to a decrease in the amount of reading done by these students. Therefore, they do not make the same gains in comprehension as do their peers who read more.

Motivation to read has been linked to students' feelings of confidence and self-efficacy (Schunk & Pajares, 1997, Henk & Melnick, 1995). For students whose identified learning disabilities affect their ability to acquire literacy skills, repeated challenges with academic tasks that involve reading have reduced their feelings of self-efficacy in terms of believing in their ability to learn to read. Low confidence in

one's ability to read has been shown to impact a student's motivation to read (Schunk & Pajares, 1997). Motivation to read (or a lack thereof) affects students' overall academic success (Guthrie, 2004, Guthrie, et. al, 2006, Whitehurst & Lonigan, 2003, Wigfield et al., 1996). This contributes to a "gap" between the academic progress of some students with identified learning challenges and their peers who do not have identified learning challenges that impact their acquisition of literacy skills. In order to "close the gap" in academic achievement, motivation to read must be increased (Schunk & Pajares, 1997). When one feels confident in one's ability to perform a specific task, then one is more motivated to do the task and is more likely to successfully complete it. When a task is successfully completed, self-efficacy is increased (Schunk & Pajares, 1997). For students with learning disabilities that affect their acquisition of literacy skills, specialized instruction should include encounters with tasks involving reading that can be successfully completed, thus building student confidence (Magno, 2010, Schunk & Pajares, 1997). Multiple opportunities to engage in these tasks are recommended. Just as repeated challenges with reading have been found to contribute to a lack of self-efficacy and low motivation to read (Schunk & Pajares, 1997), it has been proposed that repeated positive experiences with reading can increase self-confidence and feelings of self-efficacy about reading and so increase motivation to read (Magno, 2010, Schunk & Pajares, 1997, Guthrie et al., 2006).

Interventions that reduce feelings of anxiety about reading for students with identified learning disabilities may also boost students' motivation to read, including

motivation to engage in oral reading. Scaffolding through guided oral reading with a teacher has been recommended as one strategy to reduce anxiety and increase reading skills (Magno, 2010). Magno proposed that the teacher scaffolding "reduced the unpleasant emotional reaction towards reading" because the teacher "provided the necessary support to reduce (students') anxiety in reading" (Magno, 2010, p. 96). Students with learning disabilities that limit their reading proficiency stand to benefit from practices that relieve their anxiety about reading, increase their self-confidence and augment their motivation to read. One intervention with the potential to effect these changes, animal-assisted literacy instruction, is studied in this dissertation.

Animal-Assisted Literacy Instruction

Animal-assisted literacy instruction has its roots in a tradition of animal-assisted therapies that have been in existence for many years. In 1953, Boris Levinson, a child psychotherapist, discovered his pet dog had a therapeutic influence on his patients (Melson, 2001). In the 60 years since Levinson's discovery, Animal-Assisted Therapy (AAT) has been incorporated into programs for special-needs children (see Appendix A for more information on AAT and similar related terms). AAT has been used primarily to facilitate social skills for children whose diagnosis places them on the autism spectrum. Animal-assisted therapies have relied on many kinds of animals. Horses and dogs lead the list, but cats, rabbits, birds and other animals are also utilized therapeutically (Fine, 2006, Beck & Katcher, 2003).

Animal-Assisted Intervention (AAI) refers to the practice of incorporating animals into treatment interventions in order to achieve specific goals. AAI to facilitate the acquisition of academic skills, while still relatively new in school settings, has been growing over the past ten years. The most common form of AAI in the classroom is the use of therapy dogs to provide practice in oral reading.

Anecdotal reports of the success of AAI abound. This researcher typed "reading dogs" into a Google search and got 287,000,000 hits. One link was entitled "Reading to Dogs Maintains Skill Among School Kids" and states, "students who read to the dogs improved their reading ability and changed their attitudes towards reading" (Williamson, 2011, p.1). This article referenced a study conducted in the summer of 2010 through the Cummings School of Veterinary Medicine at Tufts University. In the study, second-grade students read out loud once a week for five weeks. Each reading session lasted 30 minutes. Half of the students read to people and half were paired with dogs for oral reading. Students who read with the dogs demonstrated slight gains in their reading abilities as measured by the Curriculum-Based Measurement (CBM). They also demonstrated improvement in their attitudes towards reading as measured by the Elementary Reading Attitude Survey (ERAS). Students who read with a human partner demonstrated a decrease on both of these measures. In reporting this research in the School of Veterinary Medicine newsletter, the authors noted that one third of the students who read to people failed to complete the program, while all students who read with dogs completed the program. Although this indicates that students who read to the dogs persevered in their summer

reading opportunity, the loss of participants in the comparison group compromises the ability of the study to lend much empirical support for the benefits of animal-assisted literacy instruction.

Systematic empirical studies of Animal-Assisted Instruction are rare. One recent study does provide empirical evidence that animals can help advance academic skills. Smith & Meehan (2011) conducted a study in 2009 through the University of California, Davis in which third graders in a public school setting were given the opportunity to read in the presence of certified therapy dogs for 10 minutes a week for 10 weeks. Pre- and post-intervention tests of reading fluency, measured as the number of words correctly read per minute, showed an intervention effect on fluency. Because the gains were greater for students who were well below grade-level in their reading fluency prior to the AAI, Smith & Meehan recommended that similar research be conducted with special needs students.

In the literature on the use of Animal-Assisted Interventions in educational settings, other researchers have noted a need for studies that document the potential benefits that could arise from such interventions for special needs students (Rud & Beck, 2000, Anderson & Olson, 2006, Beck & Katcher, 2003). This dissertation research was conducted for that purpose: to study whether animal-assisted literacy instruction benefits students whose identified learning disabilities affect their acquisition of literacy skills.

Purpose and Significance of Study

The research undertaken in this dissertation has two purposes. First, it is an empirical investigation of whether or not animal-assisted literacy instruction increases reading fluency, accuracy and comprehension for students who are reading below grade-level expectancies due to identified learning disabilities. The current literature on animal-assisted instruction is largely anecdotal, and researchers have called for more systematic studies of its effects, especially the outcomes for special-needs students (Rud & Beck, 2000, Beck & Katcher, 2003, Anderson & Olson, 2006, Smith & Meehan, 2011). Using a quasi-experimental case study design, this study provides a systematic examination of the effects of animal-assisted literacy instruction for students with identified learning disabilities and so offers a contribution to the state of knowledge in the field.

A second goal of this study is to understand how animal-assisted instruction might affect the reading performance of students with identified learning disabilities. No readily apparent link has been empirically established between literacy skills and animals. Hence, it is important to examine the mechanisms through which the presence of an animal could influence children's reading. This study explores three possible mediators between animal-assisted instruction and reading outcomes: (a) Motivation to read, (b) perceived confidence in reading skills and (c) anxiety about reading. The results of this inquiry promise a better understanding both of animal-

assisted instruction and of factors found to influence the performance of students with identified learning disabilities who read below grade-level.

Research Questions

This study poses four research questions. The first asks about evidence regarding the effectiveness of the animal-assisted literacy intervention to increase reading skills for students whose identified learning disabilities have affected their acquisition of literacy skills. The other three questions deal with possible mediators between animal-assisted literacy instruction and reading outcomes.

- (1) Does reading in the presence of a certified therapy dog increase reading performance measures on oral reading tests?
 - (1A) Does it increase reading fluency?
 - (1B) Does it increase reading accuracy?
 - (1C) Does it increase reading comprehension?
- (2) Does reading in the presence of a certified therapy dog increase students' motivation to read?
- (3) Does reading in the presence of a certified therapy dog increase students' feelings of self-efficacy and confidence in their reading?
- (4) Does reading in the presence of a certified therapy dog decrease students' feelings of anxiety about reading, including feelings of anxiety about reading out loud?

Significance of The Study

The significance of this research is potentially far-reaching. In addition to addressing scholarly interest in literacy instruction, the study offers a set of empirical findings to educational policy makers and practitioners seeking research-based

strategies for improving reading skills. This study demonstrates a positive relationship between animal-assisted literacy instruction and increased reading fluency, accuracy, and comprehension. Thus it not only adds to the growing body of literature that documents the benefits of animal-assisted interventions, but also offers to special education teachers a research-based strategy for increasing students' reading skills. Giving special education teachers another instructional option for teaching literacy skills could increase special needs students' potential for academic progress and thereby support students' success in all core subjects.

Special Education Terms and Acronyms

In the field of special education, there are commonly used terms and acronyms that may not be familiar to all educators and researchers. Therefore, it is important to define the following terms, as they appear repeatedly in this dissertation. A more complete glossary of terms used in this dissertation can be found in Appendix A.

ADD/ADHD: ADD is Attention Deficit Disorder. ADHD is Attention Deficit (with) Hyperactivity Disorder. Diagnosis can be made by a physician or by an outside-of-school evaluator with expertise in ADHD. This is an identifiable learning disability. Children may have challenges with attention and focus that are not diagnosed as ADHD but are noted as a specific learning disability (see Appendix A for more information).

Dyslexia: According to Tunmer & Greaney (2010), dyslexia is defined as "(a) persistent literacy learning difficulties (b) in otherwise typically developing children (c) despite exposure to high quality, evidence-based literacy instruction and intervention (d) due to an impairment in the phonological processing skills required to learn to read and write." (Tunmer & Greaney, 2010, p. 239). Reading challenges typically ascribed to dyslexia include the tendency to miscue while reading. Miscues may be errors of letter and/or word omission, addition, substitution and transposition. These miscue errors are, in special education evaluations, often determined to be due to specific visual processing deficits, auditory processing deficits and/or attention/focus challenges. (See "identified learning disabilities", below, and Appendix A for more information on these specific learning disabilities). In this research proposal, I have used the term dyslexia and dyslexic only where those terms were used by the researchers whose work is being discussed (Singleton, 2005, Carroll & Iles, 2006, Tunmer & Greaney, 2010). The term dyslexia is not commonly used, professionally, in special education in the United States at this time.

Identified Learning disabilities: learning challenges that have been identified by a school psychologist, by a physician or by an outside evaluator with expertise in this area. Identified learning disabilities include Specific Learning Disabilities (SLD, which includes visual processing challenges, working memory challenges, some attention/focus challenges and fine motor delays), Speech/Language Disabilities (which include challenges with auditory processing, auditory memory, and expressive and/or receptive language skills), Autism, Emotional Disturbance, and Other Health

Impaired (which includes ADHD, Anxiety Disorder and other health challenges that interfere with expected academic progress). Not all identified learning disabilities impact the acquisition of literacy skills. Some students with identified learning disabilities struggle with other academic tasks but are proficient readers. Therefore, in the writing of this dissertation, the researcher has clarified this for the reader by noting when study participants (in this study or referenced studies) were students whose identified learning disabilities affected their acquisition of literacy skills.

IEP: an Individualized Educational Plan (IEP) developed by the IEP team to address the needs of a student who has qualified to receive special education support. Every student receiving special education support has an IEP (see Appendix A for more detail on this term).

Miscues: words that are mis-read while reading, usually noted during oral reading sessions. Miscues are more numerous for students who have visual processing challenges because words can be mis-perceived (see Visual Processing Challenges, below). Miscues are also more numerous for students who have attention/focus challenges because students with attention/focus challenges do not attend as closely to the form and phonology of the words they are reading.

Reading Accuracy: the number of words accurately read during a reading session or during a timed reading of a passage. On the Basic Reading Inventory (BRI), the Brigance, the Gray Oral Reading Test (GORT) and other commonly-used reading

tests, reading accuracy is measured in terms of the number of miscues made while orally reading a selected passage.

Reading Comprehension: understanding what is read through an active construction of meaning that involves critical thinking on the part of the reader. For the purposes of this study, reading comprehension is determined by participants' answers to a series of questions that follow each grade-leveled reading passage during pre- and post-testing on the GORT and the BRI. Questions are factual and inferential.

Reading Fluency: reading with speed, accuracy and proper expression. On tests such as the BRI, reading fluency is determined simply by the number of correctly read words in a minute of oral reading. For the purposes of this dissertation, reading fluency will be measured by correctly read words per minute for the BRI and by a combination of rate and accuracy scores when reading passages of the GORT.

Reading Rate: the speed at which a grade-leveled passage is read. On the GORT, the amount of time required for a student to read a given passage is scored according to rates that are normed for the student's age.

RSP: Resource Specialist Program (RSP) is the least restrictive setting in which a student may receive special education support in the United States (see Appendix A for more details on this term).

Speech/Language Challenges: challenges in expressive language, receptive language and/or auditory processing that are found to impact academic achievement (see Appendix A for more information on this term).

Visual Processing Challenges: identified challenges with visual perception, visual memory, visual sequential memory, visual form constancy, visual spatial relationships, visual closure, visual figure-ground, visual-motor skills, visual working memory, or a combination of these and other specific visual processes. (See Appendix A for more information on identifying visual processing challenges.)

Students with visual processing challenges often mis-perceive words when they read. Typical are errors of omission (leaving out letters in a word such as when they read "plant" for "planet"), errors of addition (adding letters to a word such as when they read "salt" for "sat"), errors of substitution (substituting letters in a word such as when they read "had" for "hid" and "his" for "him") and errors of transposition (transposing letters in a word such as when they read "gril" for "girl" or "jets" for "jest").

Although many people refer to these types of reading challenges as "dyslexia", this is not a term used in special education referrals, evaluations, reports, or to guide IEP goals or team decisions in the United States at this time. Therefore, in this research proposal the term dyslexia or dyslexic is only used when the researchers whose work is cited in this dissertation used these terms. Otherwise, the terms "visual processing challenges" or simply "identified learning disabilities" are used.

CHAPTER 2:

LITERATURE REVIEW

Research has documented that the teaching of literacy skills begins prior to preschool and includes learning "ways with words" (Gee, 2003, p. 41) that are rooted in home- and community-based discourses. Oral language, then, provides the building blocks for learning to read and write (Whitehurst & Lonigan, 2003). Oral language is encoded into visual codes. These visual codes are decoded and interpreted through reading. "Reading is a process of translating visual codes into meaningful language" (Whitehurst & Longigan, 2003, p. 18). For some students with identified learning disabilities, this translating of visual codes is impacted by their tendency to mis-perceive words as they read.

Identified challenges with visual processing skills cause students to make miscues while reading and these miscues affect reading fluency, accuracy and comprehension (Singleton, 2005). Often termed "dyslexia", such miscues while reading have also been associated with "an impairment in the phonological processing skills required to learn to read and write" (Tunmer & Greaney, 2010, p. 239). Among the strategies that have been researched for supporting literacy acquisition for all students, including those who have difficulty acquiring literacy skills due to identified learning disabilities, is the use of oral reading. Paired oral reading, guided oral reading and repeat oral reading have been found to be effective strategies for building literacy skills for all students and to be especially helpful for students who have difficulty

acquiring these skills (Algozzine et al., 2009, Scull, 2010, Idol, 2010, Katz & Carlisle, 2009, Kesler, 2010, Rasinsk & Hoffman, 2003, Magno, 2010, Zbornik, 2001).

Oral reading, however, is not readily engaged in for students with identified learning disabilities who struggle to acquire grade-level reading skills. For these students, years of repeated struggles with reading can result in feelings of stress and worry when literacy accuracy is demanded (Carrol & Iles, 2006) and this impacts their willingness to engage in reading activities. Research has demonstrated that students who struggle to acquire grade-level reading skills are not motivated to engage in reading activities (Guthrie, 2004, Guthrie et al., 2006, Schunk & Pajares, 1997, Whitehurst & Lonigan, 2003, Wigfield & Guthrie, 1997). Motivation to read has been linked to students' feelings of confidence and self-efficacy (Schunk & Pajares, 1997, Henk & Melnick, 1995). Poor confidence in one's ability to read has been shown to impact students' motivation to read, including motivation to read orally (Schunk & Pajares, 1997, Henk & Melnick, 1995).

Contributing to a lack of motivation to read orally is an increase in anxiety about reading for students with identified learning disabilities who have struggled to acquire literacy skills. Research has determined that anxiety levels in students with identified learning disabilities are greater than the levels of anxiety experienced by students who do not have identified learning disabilities (Carrol & Iles, 2006). Anxiety is

particularly high when students with identified learning disabilities engage in oral reading (Carrol & Iles, 2006, Lynch 2006, Zbornik, 2001).

Incorporating animals into academic activities has been found to increase motivation and decrease anxiety for students whose identified learning disabilities have impacted their acquisition of literacy skills. Research has shown that animals can increase motivation to engage in reading activities (Guthrie et al., 2006, Sorge, 2008). The presence of animals can also reduce students' anxiety when they are engaged in reading activities, including anxiety associated with oral reading (Lynch, 2003, 2006).

This literature review discusses research on (a) the use of oral reading as a strategy for building literacy skills for students who have difficulty acquiring these skills, including special needs students who have difficulty acquiring literacy skills due to identified learning disabilities. This literature review also discusses (b) research on motivation as a factor influencing the acquisition of literacy skills, (c) research on self-efficacy and the role it plays in the acquisition of literacy skills, (d) research on the role that anxiety plays in literacy acquisition, especially for students who have identified learning disabilities (including those with "dyslexia"), (e) research on animals and their role in reducing anxiety, including research on the use of animals in the classroom, (f) research that explores the role of animism in the rationale for conducting this study and (g) research on animal-assisted academic interventions, including recently-completed studies on animal-assisted literacy skills instruction.

Oral Reading in Literacy Skills Instruction

Oral language patterns provide the foundation upon which formal literacy instruction builds (Gee, 2003). Formal literacy instruction includes the teaching of reading and written language in the home and in a classroom setting. Formal literacy instruction has often been approached as a set of skills to be learned by the student through the instruction provided by the teacher. These skills have included teaching the alphabet and sound-symbol relationships (phonemic awareness), teaching rules that can be utilized to decode and encode words (phonics instruction and phonics-based spelling instruction), teaching grammatical rules for formulating sentences in written language and instruction in making meaning from texts (reading comprehension).

When a child has a specific learning disability, the teaching of these literacy skills does not necessarily result in the acquisition of literacy skills that meet grade-level expectations. In spite of a solid knowledge of sound-symbol relationships, a child with visual processing challenges often mis-perceives the letters or their sequence within a word and so has difficulty decoding that word (Singleton, 2005). For these students, the context within which words are placed is critical. Rather than decoding individual words, the "dyslexic" child must rely upon decoding words within the context of a sentence, passage or story so that mis-perceived words can be corrected and the text can "make sense".

Literacy acquisition researchers have emphasized that even children who have strong decoding skills may lack comprehension skills (Scull, 2010). "Embedding" comprehension in the oral reading of texts has been recommended. Research has shown that teaching reading comprehension skills as sub-skills taught independently from the task of reading does not necessarily result students learning to comprehend what they are reading (Scull, 2010). Embedding comprehension instruction through guided oral reading puts the emphasis on comprehension as a process rather than as a product. This process includes guiding students to become actively engaged in constructing meaning from what they are reading. When participating in guided oral reading, adults facilitate students' active engagement with the text. This includes drawing out students' prior knowledge and applying it to what is being read. In addition, it includes facilitating students' summarizing while reading, making predictions about what might happen next in the story, and discussing unfamiliar words. While the adult may ask clarifying questions, the goal is for children to become self-monitoring while reading and to seek answers to their own questions about what they are reading. Therefore, guided oral reading is a key strategy for helping students to "make sense" of what they are reading (Scull 2010, Idol, 2010, Katz & Carlisle, 2009).

In Scull's study (2010), eight Reading Recovery teachers were observed coaching students who were struggling to acquire literacy skills. When students struggled to decode a word, the Reading Recovery teachers coached them to consider what would "make sense" and to compare that with the phonetic structure of the challenging

word. The Reading Recovery teachers asked questions of the students, guiding them to summarize what had been happening in the story they were reading, to access prior information and to predict what might happen next. Teachers supported students' "active, independent problem-solving, establishing and reinforcing the search-and-check actions of students" (Scull, 2010, p. 93). Teaching beginning readers to self-monitor while reading so they can detect and resolve errors in their reading by determining what would make sense is considered to be central to the concept of building reading comprehension skills (Scull, 2010).

Such "constructing of meaning" within the context of reading out loud to another provides the foundation for the comprehension component of the Reading Success program, which is designed to teach children with identified learning challenges that affect their acquisition of literacy skills (Idol, 2010). Using oral reading of texts at the students' independent reading level, the Reading Success program promotes students' active engagement in constructing and interpreting meanings from the text. The Reading Success program also uses the strategy of multiple readings of texts, which was found to build reading accuracy and fluency in addition to reading comprehension (Idol, 2010). In reviewing the efficacy of this program, Idol (2010) noted significant gains in reading skills for all participating students.

Literacy acquisition theory as reflected in a review of current literature includes repeated reading (both silent and oral) and oral reading as part of a comprehensive approach to reading instruction. Research has shown that peer-assisted oral reading

can improve reading fluency (Algozzine et al., 2009). Identifying fluency as a critical component to early literacy skills acquisition, Algozzine et al., (2009) studied the effect of peer-mediated learning teams as part of the reading instruction provided for at-risk students. The students who participated in the study had scored below expectancies on standards-based assessments and were at-risk for school failure but had not yet been identified as eligible to receive special education services. The results of the study indicated that paired-reading (peer-assisted oral reading) significantly improved participants' reading skills. Benefits included increased fluency (above the levels of the control group, which did not receive peer-assisted oral reading as part of its reading instruction) and increased comprehension. One of the factors noted by researchers as promoting reading fluency was the opportunity to read a text more than once in order to gain confidence as well as gain fluency in oral reading.

Oral reading has been studied as a tool for gaining a better understanding of how students interpret what they read. This is of particular importance when the students have been identified as "dyslexic" and so make miscue errors that impact their ability to comprehend what they are reading. Reading out loud to an adult allows these miscues to be corrected while reading, which can improve comprehension for these students. Oral reading with a teacher allows the teacher to identify the kinds of errors the dyslexic student is making. Singleton (2005) reviewed the literature on studies conducted with dyslexic boys in the United Kingdom and found that research supports the theory that dyslexic students make miscue errors that are different from

those made by non-dyslexic students. Singleton reported that studies have shown that, while non-dyslexic students made errors that demonstrated difficulty with aspects of grammatical structure, the errors of the dyslexic readers "showed poor graphophonic similarity to the text and relied more on contextual cues" (Singleton, 2005, p. 10) than non-dyslexic readers. Singleton proposed that "studying oral reading, especially from different perspectives, enables teachers and researchers to gain a better understanding of the child and his difficulties, but also helps teachers to analyze their own teaching methods" (Singleton, 2005, p. 11). This is important, Singleton noted, so instruction for dyslexic students can include practice in using contextual cues to correct the specific kinds of miscue errors these students make while reading.

Katz & Carlisle (2009) studied the Close Reading (CR) program for addressing the need to link instruction in decoding with strategies for inferring the meanings of unfamiliar words that are encountered while reading for students who have experienced a history of difficulty in acquiring literacy skills. Noting that middle-to-upper elementary school students with reading challenges tend to lack perseverance in comprehending what they read, Katz & Carlisle (2009) studied whether explicit instruction in Morphological Analysis (MA) and Context Analysis (CA), paired with practicing these skills in guided oral reading, could support students in becoming more engaged and analytic in their reading and so improve their independent reading comprehension. The authors refer to this active engagement while reading as "Close Reading".

Central to CR is connecting in an active, thoughtful way with the text while reading. Guided oral reading provides the opportunity for students to engage in conversation about the text they are reading. These conversations with the listening adult allow for discussions that can shed light upon the meaning of unfamiliar or complex words. In the CR program, these words are discussed both in terms of their morphological structure and in terms of contextual clues. Through these discussions, students are able to discern the meanings of unfamiliar or complex words.

Explicit instruction in MA and CA, combined with such guided oral reading, allowed students in the CR program to become more analytic and engaged while reading. To foster independence with these skills, the researchers gradually reduced the frequency and the complexity of the discussions that took place during guided oral reading. The CR program was found to be effective in improving reading comprehension through improving participants' ability to be actively engaged in the texts they were reading, constructing meaning through both morphological analysis and context-analysis strategies. Oral guided reading (also referred to as "shared reading" by the authors) was a key component of the CR program.

"Shared reading" has been proposed as a way to provide practice in oral reading, repeated reading of texts and to build vocabulary while assisting students in constructing meaning from texts (Kesler, 2010). Based upon the sociolinguistic and cognitive constructivist theoretical perspectives on learning, Kesler used the CLOZE procedure with English learner students who were below grade-level expectancies in reading. When using the CLOZE procedure, selected words are left out of sentences

and the reader must use context cues and prior knowledge, combined with the phonetic construction of these words, to determine the missing word. Kesler proposed using four strategies to build literacy skills through the CLOZE procedure: Possible Sentences, Using Context Cues, Repeated Readings and Using Our Bodies. These reading activities allowed for an active collaboration between students, between the teacher and the students, and between the students, teacher and the text. Kinesthetic cues to the words (i.e., moving arms as if paddling to facilitate understanding of the word "paddled") were involved in the Using Our Bodies aspect of the literacy instruction. The author noted that this approach to literacy instruction allowed students to have "meaningful social interactions that expanded their vocabulary and deepened their reading comprehension" (Kesler, 2010, p. 276) as they read. This approach also increased students' motivation for participating in literacy instruction.

Motivation and its Role in the Acquisition of Literacy Skills

Research has shown that motivation plays a key role in the acquisition of literacy skills and that incorporating stimulating tasks into classroom instruction can improve student motivation for reading, thus improving reading comprehension. In a study on the influences of stimulating tasks on reading motivation and comprehension, researchers Guthrie et al., (2006) found that hands-on science lessons that provided reading instruction in the context of multi-sensory learning experiences improved student motivation for reading and improved reading comprehension. In this study,

animals (birds, guppies and insects) were incorporated into classroom instruction as part of a multi-sensory science curriculum. The authors noted that animals can arouse and focus attention and provide situational motivation for reading, which is especially important for students who are challenged in their acquisition of literacy skills and so have a low interest in reading (Guthrie et al., 2006).

The distinction between situational and intrinsic reading motivation was discussed by the authors. Situational reading motivation was defined by the authors as a positive but temporary response to a stimulus. When the motivation is situational, the motivation to read is only present when the specific stimulus is present. Intrinsic reading motivation was defined as a more permanent predisposition for participation in reading that does not depend upon situational circumstances. While stimulating classroom activities were found to increase situational motivation, the researchers also looked at whether these activities could lead to intrinsic reading motivation. The authors found that, "when students experience multiple situational interests in reading, accompanied by perceived competence, autonomy, or relatedness in reading activities, then students increase their intrinsic reading motivation" (Guthrie, et. al., 2006, p. 244).

Intrinsic reading motivation is essential for overall student achievement since the amount of reading that is done by a student (called "print exposure") is a strong indicator of student knowledge on a broad range of academic topics that include science and social studies as well as literature (Guthrie et al., 2006). Such broad knowledge is linked to higher scores on standardized tests and to higher student

grades and therefore motivation for reading contributes to overall school success. (Guthrie et al., 2006).

Self-Efficacy and Its Role in the Acquisition of Literacy Skills

Motivation is affected by perceived self-efficacy (Schunk & Pajares, 1997, Henk & Melnick, 1995). Based upon the cognitive theories of Albert Bandura, self-efficacy refers to one's beliefs about one's ability to learn or to perform at a specified level. When one feels confident in one's ability to perform a specific task, then one is more motivated to do that task and has a greater chance of successfully completing the task. When a task is successfully completed, self-efficacy is increased; when tasks are challenging, self-efficacy can waver (Schunk & Pajares, 1997). Repeated challenges with reading reduce children's feelings of self-efficacy in terms of believing in their ability to learn to read (Schunk & Pajares, 1997). This contributes to a lack of motivation to read for children who have difficulty acquiring literacy skills (Schunk & Pajares, 1997, Henk & Melnick, 1995). According to Henk and Melnick (1995), "How an individual feels about herself/himself as a reader could clearly influence whether reading would be sought or avoided – and how persistently comprehension would be pursued" (p. 472).

In order to build self-efficacy with reading for children who have struggled to acquire literacy skills, reading experiences need to be carefully scaffolded so that the text level is not too challenging, and there should be a minimum of corrections that could be perceived by the child as criticism (Schunk & Pajares, 1997, Magno, 2010).

Once the children experience reading as a positive endeavor and they gain feelings of success with it, then self-efficacy can be built and this can lead to an increase in motivation to read.

According to Schunk & Pajares (1997), self-efficacy influences motivation, which influences learning and so promotes achievement. Self-efficacy is built through self-appraisal as well as the appraisals received from others, and through students' physiological reactions to their learning experiences (Schunk & Pajares, 1997, Henk & Melnick, 1995). It is important to note here that the physiological reaction that is commonly experienced by children who have struggled with reading, when they are engaged in literacy instruction and activities, (particularly when engaged in oral reading), is an increase in blood pressure and a tightening of muscles (Lynch, 2006). Both of these physiological reactions are associated with feelings of anxiety.

Anxiety's Role in Literacy Acquisition Challenges

According to Lynch (2006), it is not surprising that reading out loud can cause anxiety for children who have difficulty acquiring literacy skills. Lynch's study found that simply speaking, in conversation, caused a rise in blood pressure for adults and children. The higher the baseline blood pressure, the more it rose when the study participants talked. Lynch observed a similar rise in blood pressure when children read books out loud. Lynch determined that this increase in anxiety, as measured by elevated blood pressure, occurred in both the home and school settings.

Students who struggle to read due to identified learning disabilities have been found to have a higher than usual amount of anxiety, particularly anxiety about academic tasks. In a study conducted on anxiety levels in college-age "dyslexic" students, researchers Carroll and Iles (2006) determined that children and adolescents with dyslexia show higher anxiety levels than children and adolescents who do not have dyslexia. The authors cite research by Willcutt and Pennington (2000), who conducted twin studies where one twin had identified learning challenges while the other twin did not. Identified learning challenges for those who participated in the study included hyperactivity, conduct disorder and reading disability. Willcutt and Pennington determined that anxiety was associated with both twins when hyperactivity and conduct disorder were present in one twin, indicating that genetic and environmental influences may have contributed to the anxiety for both twins. However, for twins where one twin had an identified learning disability, anxiety was elevated only for the learning-disabled twin. Anxiety was not elevated in the non-disabled twin. This suggests that the increased anxiety levels in the reading-disabled twin occur as a consequence of literacy difficulties, rather than being caused by the genetic and environmental influences common to both twins (Willcutt & Pennington, 2000).

Carroll and Iles note that there is a growing body of evidence that individuals with literacy difficulties show increased levels of social anxiety in addition to anxiety about reading. In their study, dyslexic and non-dyslexic participants completed measures of reading ability (TOWRE) and also completed measures of anxiety that

included Academic, Social and Appearance. The dyslexics performed less well than controls on the reading ability test. There was also a significant difference on the measures of anxiety. Social anxiety and academic anxiety were both elevated in dyslexic students. The authors suggested that students with weak reading skills are more likely to be anxious in social situations as well as anxious about academic tasks. Carroll and Iles (2006) concluded that their research supported the previously hypothesized associations between learning disabilities, including those that affect reading skills, and vulnerability to emotional consequences such as anxiety. They noted that their findings support the assumption that years of repeated struggles with reading "will have disposed dyslexics to feel signs of stress, worry and anxiety when placed in a situation demanding literacy accuracy" (p. 657).

While Carroll and Iles documented that reading difficulties can lead to higher levels of anxiety, educational researchers Neville, Pfof and Dobbs (1967) noted that anxiety relates negatively to reading comprehension and so to overall school achievement. Neville et al., found that students with high anxiety levels scored significantly lower on reading comprehension measures than students with low- and medium-levels of anxiety. The researchers concluded that anxiety is a relevant factor in influencing children's performance on tests, and "probably is a negative influence on general academic performance" (Neville et al., 1967, p. 49).

According to these studies, children with identified reading challenges tend to be more anxious. This can negatively impact their academic performance, which can

lead to more anxiety about engaging in academic tasks. It has been proposed that scaffolding, provided through guided oral reading with a teacher, can reduce anxiety and so improve reading skills (Magno, 2010). Magno proposed that the reason for the reduction in anxiety about reading was that the teacher's scaffolding "reduced the unpleasant emotional reaction towards reading" because the teacher "provided the necessary support to reduce (students') anxiety in reading" (Magno, 2010, p. 96). Can animals in the classroom provide a similar feeling of support and so reduce anxiety for students with identified reading challenges?

Animal-Assisted Interventions

Lynch (2003) found that reading anxiety can be reduced in children simply by petting a trusted pet. Lynch measured blood pressure levels on 38 children, both when reading and when at rest. Measures were taken twice: first with no animal present and then with a friendly dog brought into the room. The close presence of a dog lowered the children's blood pressure while at rest and while reading. Lynch also measured his own daughter's blood pressure while reading a book out loud and while sitting quietly. His daughter's dog was then placed in her lap and her blood pressure level dropped almost 50% from the peak recorded while reading the poetry, to a level that was even lower than her baseline measure. Lynch noted that studies have demonstrated that animals' blood pressure drops as soon as humans touch them. Very similar reactions occur in humans when they touch their animals. Touching an animal is not necessary to reduce blood pressure. According to Lynch, a study

conducted by Katcher (1970) measured blood pressure levels while study participants practiced various meditation techniques and these measurements were compared to blood pressure levels obtained while participants focused on fish swimming in a tank. This study showed that blood pressure levels were lower during the fish-gazing activity than during any of the meditation practices (Katcher, 1970 as cited by Lynch, 2006).

Lynch (2006) hypothesizes that the reduced blood pressure and resultant calming is due to what he terms "the physiology of inclusion" which is, according to Lynch, the opposite of "the physiology of exclusion". Exclusion occurs when other people and/or animals are seen as a threat so that the fight-or-flight response is activated. Lynch proposes that the physiology of exclusion has its foundation in our ancient ancestors, when such a response would save lives that were threatened by predators or human enemies. Today such fight-or-flight responses can be activated by stress-inducing situations, including educational tasks such as oral reading. The Physiology of Inclusion, however, is "a biological state of enhanced relaxation." (2006, p. 3). It is made possible when humans feel "safe" and secure. For some children, animals trigger feelings of inclusion and so produce in those children a state of relaxation that persists even when they are presented with tasks such as reading out loud that could, without the presence of an animal, trigger a fight-or-flight response.

Kruger and Serpell (2006) caution that culture and individual experience play important roles in determining peoples' responses to animals, but also note that

animals provide a simultaneous engagement of attention and a calming effect. Studies have shown (Kruger & Serpell, 2006) that any stimulus that concentrates the attention has a calming effect on the body. According to the authors, a popular explanation for this phenomenon has its roots in the evolutionary development of humans. E.O. Wilson (1984) developed the theory of *biophilia hypothesis*, which asserts that humans have an innate tendency to focus on life and lifelike processes. Kruger & Serpell (2006) note that the foundation of biophilia is that, "from an evolutionary standpoint, humans increased their chances of survival through their attention to, and knowledge of, environmental cues." (p. 27) Therefore, when children are in the presence of an animal, attention and alertness are increased, which may not only reduce anxiety, but, the authors propose, increase the child's availability for learning (Kruger & Serpell, 2006).

Rud & Beck (2000) found that animals in classrooms have a "calming effect on the children and made them more open to engaging in cognitive and social activities" (p. 314). Using a mixed-methods research design, Rud & Beck collected quantitative data through surveys and also collected qualitative data through classroom observations and through teacher interviews. Rud & Beck found that animals in the classroom influenced students' emotional well-being and that this increased sense of well-being could contribute to an improvement in social skills and have a positive influence on academic achievement. These positive influences were noted for the special needs fourth graders who participated in the study as well as for students who were not identified as having special needs.

Anderson & Olson (2006) studied the presence of a therapy dog in a self-contained classroom for children with severe emotional disorders. Using a case study design, Anderson & Olson collected qualitative data through observations and interviews. They also collected behavioral data when students were considered to be in emotional crisis. This study found that the presence of a dog in the classroom contributed to a reduction in the number and duration of emotional crises and contributed to students' overall emotional stability. The study also determined that the presence of the therapy dog facilitated student learning through improving students' attitudes towards school. In their concluding remarks, Anderson & Olson noted, "Further study of the value of pets in special education settings is warranted." (p. 48)

At the time that Anderson & Olson made this recommendation, very few studies had been conducted on the value of pets in special education settings. In one of the few studies, Mallon (1994) had studied the presence of a therapy dog in a residential treatment center for children with significant behavior and academic difficulties. Mallon concluded that the presence of the therapy dog not only improved the children's social relationships, but also provided the children with the opportunity to receive love, acceptance and non-judgmental listening when the children talked to the dog (Mallon, 1994).

It is this non-judgmental listening that has been proposed to be one of the benefits of having children read to dogs during oral reading sessions (Butler, 2009). Butler notes that children pause to explain parts of the story they are reading to the dogs that

are "listening" to them read. This, Butler explains, can improve the children's reading comprehension. Children who do this are demonstrating that they believe the dogs they are reading to can understand human language.

It is not uncommon for children to believe that dogs and other animals can understand human language. In fact, this belief was noted by developmental psychologist Jean Piaget and was included by Piaget as part of what he termed the pre-operational stage of child development. Piaget referred to this aspect of the pre-operational stage as "animism".

The Role of Animism in This Study

Animism is defined as a belief that there is an invisible "essence", a soul or spirit, in all things (Serpell, 2006). According to Piaget, animism in the context of stages of child development is the belief that both living and non-living things are alive. Tied to egocentrism, which is also part of Piaget's pre-operational stage, children between the ages of two and seven view the world from their own perspective. Since they are alive and can understand language, children in the pre-operational stage of development believe that all things in their environment are alive and can understand language (Looft & Bartz, 1969). Children in this stage of development may talk to stuffed toy animals as well as living animals, and believe that the animals understand them.

Some recent research has questioned Piaget's theories. Research conducted by Wellman & Gelman, (1992) proposes that the distinction between living and

nonliving may occur much earlier in a child's development (Wellman & Gelman, 1992). Other research has documented animistic beliefs in middle-aged adults (Parry & Stewart-Hamilton, 2010) and in older children (Looft & Bartz, 1969). In their review of the literature on animistic thought, Looft & Bartz (1969) discussed Piaget's theories on animism and noted that animistic thought has been found "among populations of all age ranges and of great cultural differences" (Looft & Bartz, 1969, pp. 8-9). Questioning Piaget's theory that children move through developmental stages at specific ages, Looft & Bartz (1969) pointed to studies that have found evidence of animism in older children and even into adulthood. Therefore, children beyond the age of seven may very well believe that when they are reading orally to a therapy dog, the dog understands what they are saying.

According to Serpell (2006), animist belief systems have been a part of human societies since prehistoric times. Evidence of this includes depictions of animals alongside human figures in ancient cave art, the prevalence of animal-like god figures in cultures around the world and shamanistic healing rituals that included animals as agents of healing. Serpell (2006) proposes it is this ancient belief in the ability of animals to promote healing that led to the inclusion of animals in 19th century healing institutions. Patients in these institutions could be seen "pouring out their woes" to the dogs and cats on the premises (Serpell, 2006, p. 13), as if the animals could understand what they were saying.

Speaking to animals "as if" they understand is not reserved to patients in 19th century healing institutions. Animistic beliefs are at work today when people talk to their pets "as if" they understand. McNicholas & Collis (2006) note that pet owners often state that they believe their pet understands their moods and when one observes pet owners interacting with their pets, their interactions appear to be social interactions. The authors note that this is due to the ability of humans to engage in pretense, such as when a child holds a banana to his/her ear and pretends it is a phone. Arguing that pretense is a cognitive ability of humans that is not shared with many other species, the authors state it is "a very reasonable human thing to interact and relate to companion animals as if they were more human than they actually are." (McNicholas & Collis, 2006, p. 56) Interacting and relating to companion animals in such a way is a reflection of animistic beliefs that have their roots in our ancient relationships with animals as well as in our cognitive development as proposed by Piaget.

The importance of animistic beliefs in this research study is this: if children believe that animals can understand them, or are willing to suspend disbelief and pretend that animals can understand what they are saying, then pairing a child with an animal for oral reading practice may serve a similar purpose as that provided by pairing a child with a peer for oral reading practice. Pairing a child with an animal rather than a peer could not provide input from the reading partner, which is one of the benefits of peer-assisted oral reading, where the children are able to co-construct meaning from the text through social interactions and discussions about the text.

However, pairing a child with an animal for oral reading practice could provide students the opportunity to construct their own meaning of the text, especially when they are asked to explain the story to their animal reading partner. And pairing a student with an animal can provide practice in oral reading, including the opportunity to engage in repeated reading of a story or passage to a non-critical "listener".

Animal-Assisted Literacy Instruction

Over the past ten years, therapy dogs have become increasingly popular as "reading dogs". These "reading dogs", (sometimes referred to as "reading therapy dogs"), have been used in libraries and in some classrooms to assist children who have challenges with learning to read or who are reluctant readers.

Using dogs for "reading therapy" had its formal beginnings in 1999. Sandi Martin, a critical care nurse and board member of Intermountain Therapy Animals, had been bringing her therapy dogs into hospital rehabilitation programs. In 1999, she brought six therapy dogs into a public library in Salt Lake City, Utah and offered "Dog Day Afternoons" to children aged four to eleven. It became so popular that in 2000, a program was designed for use in Bennion Elementary School in Salt Lake City. Ten children participated in a pilot program at Bennion Elementary School. All ten of these children showed improvement in reading scores and other academic subject scores, as well as an improvement in school attendance, confidence and self-esteem (Public Libraries Online, 2011).

Following this successful pilot program, other schools in Salt Lake City began to use "reading therapy" dogs also. Intermountain Therapy Animals created a special training program for therapy dog handlers to bring such programs into schools and libraries. They named this program Reading Education Assistance Dogs (R.E.A.D.). The R.E.A.D. program provides training to handlers that includes training in supporting literacy skills acquisition such as helping children to select appropriate books for the reading session, helping readers with challenging words and supporting reading comprehension with such strategies as having children re-tell the story "so the dog can understand it". Public Libraries Online (2011) notes that, "R.E.A.D. training emphasizes nurturing each child's reading practice with supportive and engaging interactions designed to improve the child's reading as well as to encourage a more positive attitude toward the reading process" (Public Libraries Online, Sept/Oct 2011, p. 3). According to the website for Intermountain Therapy Animals, there are now thousands of registered Reading Education Assistance Dogs (R.E.A.D.) working in schools and libraries across the United States, Canada, the United Kingdom and other parts of the world.

The Carolina Canines for Therapy program (CCT) is one organization that has utilized the R.E.A.D. program in schools and libraries. The Carolina Canines for Therapy organization created the Canines for Literacy program. Using R.E.A.D. training guidelines, CCT brought therapy dogs into schools and libraries in 2002 through a program they called "Paws for Reading". According to the CCT website, 370 children in North Carolina schools and 500 children in North Carolina libraries

have benefited from reading with therapy dogs through this "Paws for Reading" program. They report that 83% of the participating children have demonstrated improvement in their reading skills (Carolina Canines for Therapy website, December 2011).

Across the United States, libraries and some schools are now including "reading therapy dogs" under various program names. According to the Public Libraries Online article on PAWS for Reading (2011), the Paws for Reading program is now providing reading support at the La Mesa Branch of the public library in San Diego, California, "Thursdays with MacGyver" in New York and several programs in North Carolina. "See Spot Read" was founded in North Carolina in 2008 and now has over 50 teams of dogs with their handlers who provide PAWS for Reading in schools and libraries in North Carolina.

Another program that provides animal-assisted "reading therapy" has been called Bonding Animals, Reading, Kids, and Safety (B.A.R.K.S.). Formed through Helping Paws International, the B.A.R.K.S. program was started in 2001 by Helping Paws member Amy Parsons, who was a school psychologist in Durham County, North Carolina. Although Ms. Parsons collaborated with Intermountain Therapy Animals as they developed the R.E.A.D. program, she has included a unique component to the B.A.R.K.S. program that is not included in the R.E.A.D. program. Children who participate in the B.A.R.K.S. program do not simply read to a passive dog "listener". Instead, the children are told that they are going to teach participating dogs how to

read. According to the Public Libraries Online article (Sept/Oct 2011), assistance-service dogs trained through the B.A.R.K.S. program have been taught to read 25-30 words and are able to understand those words in short written sentences. B.A.R.K.S. ensures that teams of dogs and their handlers receive training that is specific to literacy instruction in addition to standard therapy dog training. According to the B.A.R.K.S. website, children who participate in the B.A.R.K.S. program "usually increase their reading scores an average of 2 grade levels/year while improving in other courses and class interactions." (Helping Paws International website, p. 1).

Many therapy dog programs now train handlers and dogs to participate in "reading dog therapy." Among them are the Delta Society, Therapy Dogs Incorporated, Therapy Dogs International and Intermountain Therapy Animals. The Intermountain Therapy Animals website echoes the sentiments of Rud & Beck (2000) when they lament that there have been few studies conducted on the contributions dogs may make to literacy instruction in classroom settings.

One recent study was conducted in the summer of 2010 through the Cummings School of Veterinary Medicine at Tufts University. The setting for this study was a library rather than a classroom. However, the study was investigating the potential benefits of "reading dog therapy" for keeping children's reading skills from regressing over the summer break from school. In this study, 18 second grade students read out loud once a week for five weeks. Each reading session lasted 30 minutes. Half of the students read to people and half were paired with dogs for oral reading. Students who

read with the dogs demonstrated slight gains in their reading abilities as measured by the Curriculum-Based Measurement (CBM). They also demonstrated improvement in their attitudes towards reading as measured by the Elementary Reading Attitude Survey (ERAS). Students who read with human reading partners demonstrated a decrease on both of these measures. In reporting this research in the School of Veterinary Medicine newsletter, it was noted that one third of the students who read with human partners failed to complete the program while all students who read with dogs completed the pilot program (Tufts School of Veterinary Medicine, 2011). While this pilot study indicates that students who read to dogs persevered in their summer reading opportunity, it was not a study that investigated the use of animal-assisted literacy instruction. The study did not take place in a classroom setting where children read to dogs as part of their literacy instruction. The results of the study may have been affected by the fact that students were reading during a time when they generally enjoy a break from academic activities. Additionally, the loss of participants in the comparison group compromises the ability of this study to lend much empirical evidence of the benefits of oral reading to dogs compared to oral reading with a human partner.

One of the few research studies conducted in a classroom setting has provided empirical evidence regarding the benefits of animal-assisted literacy instruction. This study was conducted in 2009 through the Animal Ambassadors program at U.C. Davis. In the study Smith & Meehan (2010) reported that when therapy dogs were brought into three third grade classes and students read out loud in close proximity to

these dogs (and the dogs' handlers) for 10 minutes per week for 10 weeks, reading fluency was improved. The students, dogs and handlers sat on blankets on the floor. The handlers did not interact with the students other than to help, occasionally, with a challenging word. This study found improved reading fluency (number of words read per minute) of 12% overall with improvement of up to 46% for students who were reading below grade level at the beginning of the study.

Smith & Meehan conducted a similar study with home-schooled students who came onto the U.C. Davis campus in order to participate in the study. Students sat on blankets on the floor with the dogs next to them and the handlers nearby. Each student read out loud to a dog for 10-15 minutes per week. Over the course of this 10-week study, students improved in their reading fluency, overall, by 30%. (The average number of words read per minute at the beginning of the study was 96 and at the conclusion of the study, the average had increased to 121 words per minute). A paired samples t-test showed statistically significant improvement ($p < 0.001$). Smith and Meehan noted that reading accuracy remained consistent (an average of 2 errors made on the pre-tests and on the post-program tests). A survey of parents whose children participated in this study indicated that 75% of the parents reported that their children had increased in their confidence about reading out loud and also read aloud more frequently. This study was intended to measure changes in students' attitudes towards animals as well as to measure changes in reading fluency. The study did not include reading comprehension measures and was not focused on students with

special needs. In their concluding statements, the authors recommended that similar research be conducted with special needs students.

In addition to Smith & Meehan (2010), other researchers have noted a need for studies that document the potential benefits that could arise from animal-assisted academic interventions for special needs students (Rud & Beck, 2000, Anderson & Olson, 2006, Lynch, 2006). This dissertation research was conducted for that purpose: to study whether animal-assisted literacy instruction benefits students whose identified learning disabilities affect their acquisition of literacy skills. The research was conducted with special needs students who receive special education in the least restrictive special education program, the Resource Specialist Program. All students who participated in the study have identified learning challenges that have impacted their acquisition of literacy skills. This study measured pre- and post-intervention reading skills. It also measured student's confidence in their reading skills pre- and post-intervention. In addition, this study explored the influence that motivation and anxiety have on reading skills for elementary-aged students whose identified learning disabilities affect their acquisition of literacy skills.

CHAPTER 3:

RESEARCH DESIGN AND METHODS

Opportunities to investigate instructional interventions during the school day are limited. Instructional time is valuable and is allocated with care. The researcher conducting this study is a special education (Resource Specialist Program) teacher in an elementary school. Her certified therapy dog, Kela, was used for the intervention. The research was conducted in the researcher's Resource Specialist Program (RSP) classroom at that school and so that context was chosen as a case within which to frame the study's inquiry about animal-assisted literacy instruction. The research case and the design, methods, examination of the teacher-researcher role, study limitations and ethical considerations are laid out in this chapter.

This study's design and methods were chosen to provide empirical evidence on four research questions. The first question inquires into the effectiveness of animal-assisted literacy instruction: does reading in the presence of a certified therapy dog increase the reading performance of students with identified learning disabilities on reading tests? The other questions were posed to learn more about the role of three variables that might mediate between animal-assisted literacy instruction and students' post-intervention reading test scores. Specifically, the questions ask if reading in the presence of a certified therapy dog increases students' motivation to read, if it improves their feelings of self-efficacy and confidence about reading, and if it decreases their anxiety about reading. The study's research questions are

operationalized in terms of specific instruments and measures in the section on data collection.

Research Design

This study of animal-assisted literacy instruction was conducted as a quasi-experimental case study. Creswell (2007) notes that, in a case study, the "case" is a system bounded by time and place. In this study, the researcher's school set the "place" boundaries of the case, and the study's duration from March 2012 through March 2013 delineated the time. Yin (2009) specifies that the research questions of a case study must examine how or why something happens, and three of the four research questions for this study look for evidence about how animal-assisted literacy instruction may affect reading skills. The study best fits in Yin's category of explanatory or causal case studies.

The study is an educational case study. In his book on the art of case-study research, Stake (1995) says that each educational case study has persons and programs that are "...similar to other persons and programs in many ways and unique in many ways. We are interested in them for both their uniqueness and commonality" (pg.1). As a special-education teacher, the researcher in this study recognizes that the students who receive special education support through the Resource Specialist Program at her elementary school are unique, and yet for researchers and others interested in animal-assisted instruction for students with identified learning disabilities, they also offer a ready basis for comparison.

The research design of this study is also quasi-experimental in nature. Shadish and Luellen (2005) describe a quasi-experimental design as one that, like an experiment, tests hypotheses about treatment effects, but that lacks random assignment of units to conditions. In this study, the animal-assisted literacy intervention is the treatment, and the study participants are assigned by convenience or expediency to either the treatment or comparison condition. The main hypothesis being tested derives from the first research question about the effectiveness of animal-assisted literacy: that the presence of a certified therapy dog increases the reading performance of learning-disabled students on reading tests. Thus the design employed to conduct this research maps a quasi-experiment onto a school case study.

Research Site

South Bay Elementary School in Seaport, California, served 651 students in kindergarten through fifth grades during the 2012-2013 school year. Of the 651 students, 444 were White but not Hispanic, 91 were Hispanic, 63 were Asian, 24 were of two or more races, 13 were African American, 8 were American Indian or Alaska Native, 4 were Filipino, 2 were Pacific Islanders, and 2 were counted as Not Reported. Eighteen percent of the students were low-income, qualifying for either free or reduced-price lunches. Fifty-one students were identified as English learners, half of whom came from Spanish-speaking households. The other half spoke one of seven other primary languages (Mandarin, Hebrew, Tagalog, German, French, Russian or Portuguese). The school is located near a university. Therefore, the school

population includes children whose parents are university students as well as children whose parents are professors or visiting professors. Many of the students who were noted as English learners have parents who came to the United States in order to study or teach at the university.

Of the students at South Bay Elementary School, 11.5% received Special Education support during the time that the study took place. Special Education services at the school range from Speech/Language-only services to intensive support that is provided for more than 50% of the school day in one of two Special Day Classes located at the school (see Appendix A for more information on these terms). There are two Resource Specialist Program (RSP) teachers at the school, serving students with identified learning disabilities who require special education support in order to access their grade-level curriculum and make expected academic gains. Both RSP teachers have 80% positions at the school and teach there four days per week.

The two RSP teachers equitably share the caseload of RSP students at the school. New students qualify for services throughout the school year and other students move away or meet criteria to exit from special education support. Therefore, the caseload for both teachers varies throughout the school year. Each RSP teacher had 23 to 26 students on her caseload during the 2011-2012 school year, and 19 to 23 students in 2012-2013. (Caseloads were reduced for RSP teachers during the 2012-2013 school year so they could join other school staff to implement a Response To Intervention (RTI) reading program for non-special education and special education students at the

school who were reading below grade-level expectancies. One of the RSP teachers provides support primarily for students in grades kindergarten through second grade while the other primarily supports students in second through fifth grades. Special Education support is provided to students through a combination of "pull out" for small-group instruction and "push in" to general education classes to provide support for students as they participate in grade-level curriculum activities.

The researcher for this study is one of the two RSP teachers. She provided special education support to students in second through fifth grade during both the 2011-2012 and the 2012-2013 school years. Some of her students did not require support for reading but required support for math, written language, or other academic or behavioral concerns. The students who participated in the intervention were students who had Individualized Educational Program (IEP) goals to increase their literacy skills.

Research Participants

The research participants were students at South Bay Elementary. All participants have identified learning challenges that had affected the acquisition of literacy skills (see Table 3.1). They were in grades two through five and all received special education support during the study. They represented a sample of convenience based upon parental consent to participate in the study and the access of the researcher to students during the instructional day. Students who received the intervention were those who were available to the researcher for participation in the intervention. These

students will be referred to as the Intervention Group. Students who were not available for participation in the intervention due to general education and special education class schedules were placed in the Comparison Group.

Students who participated in the study have identified learning challenges that include visual processing, auditory processing and attention and focus challenges (see Table 3.1).

TABLE 3.1 Research Participants by Learning Challenges

	# Participants	Visual Processing Challenge	Auditory Processing Challenge	Attention Focus Challenge	English Learner
Intervention Group, N = 9	3	X		X	
	3	X	X		
	1		X		Reclassified
	1	X			
	1	X		X	Reclassified
Comparison Group, N = 8	3	X		X	
	3	X	X		
	1		X		Reclassified
	1	X			

Three of the participating students were English learners who had been reclassified as Fluent English Proficient (RFEP) within a year of the implementation of the study.

The reclassification was done by the school's Language Review Team, which had determined that these students' challenges in acquiring grade-level literacy skills were due to their identified learning disabilities rather than due to challenges with mastering the English language.

The study spanned two school years since it began in March 2012 and ended in March 2013. Some of the students participated in the study both years and some participated during just one of the school years. Two of the intervention students were in second then third grade, two were in third grade, three were in third then fourth grade, one was in fourth grade and one was in fourth then fifth grade. Five intervention participants were female and four were male. Eight of the Intervention Group students were White (non-Hispanic), one was Filipino-American and one was Hispanic (see Table 3.2).

Of the eight students in the Comparison Group, one was female and seven were male. Five were White (non-Hispanic), two were Hispanic and one was identified as "Two or More Races (non-Hispanic)". During the two academic years of the study, one of the comparison students was in second grade, then third. One was in third grade. One was in third then fourth grade, two were in fourth grade, one was in fourth then fifth grade and two were in fifth grade.

Each student in the Comparison Group was matched to a student in the Intervention Group. The primary consideration when matching students was matching the identified learning disability or disabilities. Secondary considerations

were grade-level, gender and pre-intervention reading levels of the students in each "matched" pair. One reclassified English learner in the Intervention Group was matched with the reclassified English learner in the comparison group. No student in the comparison group provided a viable match for the other reclassified student who participated in the intervention and therefore this is the only student in the Intervention Group who is not matched with a student in the comparison group. Because the sample size was small, it was not possible to match students in terms of gender. Five of the eight matched pairs were of the same gender and three of the pairs were not matched by gender. The pairs were matched closely by grade-level and by pre-intervention reading level. All of the matched pairs were matched in terms of identified learning disability. It is important to note that there are no two students whose disabilities affect them in the exact same way, which is why every student in special education has an Individualized Educational Plan (IEP). Nonetheless, matching was done as closely as was possible given these parameters.

The Intervention

In the Resource Specialist Program small-group pull-out sessions, both comparison and intervention students received literacy instruction that, with the exception of the animal-assisted intervention, included the same components. Key to this instruction was guided oral reading in which students read out loud to the resource teacher. Often students read from core subject texts or from literature that was a part of the students' general education Language Arts program. During these

sessions, the RSP teacher encouraged students to point to words as they read to facilitate tracking since many of the students had visual tracking and/or focusing challenges. The teacher also modeled this practice for students.

Included in reading sessions were strategies for building reading comprehension, including the pre-reading of texts (of particular importance when reading core texts for Social Studies and Science) and using context cues to help students to construct meaning from the texts. This was especially important when words were mis-perceived due to students' visual processing or attention and focus challenges. Context cues include words that are in proximity to the mis-perceived or unfamiliar word that help the reader to infer meaning (Katz & Carlisle, 2009). Context cues are also cues that come from "what is happening" in the story so that the inferred meaning of the unfamiliar word will "make sense". Determining what would make sense according to what is happening in the story is also helpful for correcting words that have been mis-perceived or misread. This "embedded comprehension" strategy is similar to strategies used in Reading Recovery guided oral reading sessions (Scull, 2010).

One of the strategies that the researcher-teacher taught to all students who participated in this guided oral reading literacy instruction was to "skip" challenging words, read to the end of the sentence, think about what would "make sense" according to context cues and compare their guess to the morphology of the challenging word. If the guess did not match the morphology of the challenging

word, students were encouraged to make a second guess. After discerning the challenging word and discussing its meaning with the researcher-teacher, students re-read the sentence containing the challenging word and then continued reading the text. This is very similar to the guided oral reading that was done as part of the CR program (Katz & Carlisle, 2009) although the researcher has used this strategy for over 20 years in her Resource Specialist Program. Skip/read on/re-read was a strategy that the researcher-teacher had taught all intervention and comparison students prior to the beginning of the study. Some students in both the Intervention Group and the Comparison Group had been practicing this strategy for a year or more prior to their participation in the study.

In addition to using morphology and context of words to support the reading of unfamiliar words, the researcher-teacher supported students' connection to what they were reading by modeling and encouraging "think aloud" behaviors during guided oral reading sessions. This included pausing at various points in the text or story to discuss what was happening, asking students to make predictions about what might happen next, and discussing connections with previously read material as well as connections to the students' own experiences. This literacy instruction was designed and implemented to improve reading accuracy, fluency and comprehension for both intervention and comparison students.

The intervention took place in the researcher's classroom during the Resource Specialist Program class time or, for students who were not on the researcher's

teaching caseload, during the researcher's lunch time (but students' class time, usually during sustained silent reading times in their general education classes). The intervention introduced one major change to the pattern of instruction describe above: the presence of a certified therapy dog, positioned between the teacher-researcher and the student, during guided oral reading. The therapy dog was "involved" in the learning experience. Students were encouraged to point to the words as was typically done in guided oral reading sessions with the researcher-teacher, but during intervention reading sessions, the researcher-teacher encouraged them to point to the words so that Kela (the therapy dog) could follow their reading. Students could share their ideas with both the dog and the teacher when discussing the story, making predictions about what might happen next or using context cues to discern the meaning of unfamiliar words. When a passage needed to be re-read to ensure understanding, the researcher-teacher might ask students to re-read it "to be sure Kela heard it". At times students held a dog treat in one hand while reading to encourage the dog to orient toward the page. Students were free to pet the dog and react to her responses such as when she would perk up her ears at familiar words or in anticipation of receiving the treat.

Between pre-intervention and post-intervention tests, students received 10 reading sessions with the researcher-teacher and the dog. Each reading session lasted 10-15 minutes depending upon the length of the text being read by the student. Short stories were read in their entirety (and were of varying lengths). Readings assigned by

classroom teachers had a set number of pages to be read with the teacher-researcher, with some assignments longer than others.

The study was done in three phases. Due to unexpected delays at the onset, the first phase was just one month (May 10 - June 12) in the 2011-2012 school year. During this time seven students read in the presence of the therapy dog from one to three times per week. Students' availability to participate in the intervention depended on their general education class schedules, which included many end-of-the-year activities. Of those seven students, only two were able to complete ten reading sessions with the therapy dog before the school year ended.

Phase II Intervention included the five students who did not complete 10 reading sessions in Phase I and one student who joined the study in Phase II. One new student qualified to receive special education support in Fall 2012. This student was critically behind in reading skills and expressed a desire to read with the therapy dog so a third phase of the study was implemented (January through March, 2013).

Seven comparison students participated in Phase I of the study and three of those seven participated in Phase II of the study. One new student was added to the researcher's caseload in Fall 2012 and this student participated in the comparison group for the study's Phase II only. (See Table 3.2, below.)

TABLE 3.2 Student Participants in the Three Phases of the Intervention

	PHASE 1 May-June 2012	PHASE 2 Sept.-Dec. 2012	PHASE 3 Jan.-March 2013
INTERVENTION STUDENTS, N=9	2 students completed the intervention		
	5 students completed the intervention		
		1 student completed the intervention	
			1 student completed the intervention
COMPARISON STUDENTS, N=8	4 students participated		
	3 students participated		
		1 student participated	

Data Collection

Numerous types of data were gathered to answer the study's four research questions. In this section, the instruments and methods of data collection are discussed question-by-question, starting with the first question concerning the effectiveness of animal-assisted literacy instruction.

Studying the Effectiveness of the Intervention

The first research question asks if reading in the presence of a certified therapy dog increases the reading performance of students with identified learning disabilities on oral reading tests. This research question is answered primarily by analyzing the pre- and post-intervention growth of the Intervention Group students on the Gray Oral Reading Test, Fourth Edition (GORT-4). Through the quasi-experimental part of this

study's design, this research question is further answered by comparing and contrasting the growth of Intervention Group and Comparison Group students on the Basic Reading Inventory (BRI).

The researcher administered the GORT-4 pre-intervention and post-intervention to the nine students who participated in the intervention. The Examiner's Manual for the GORT-4 states that the tests provide an efficient, reliable and objective measure of growth in oral reading and can aid in the diagnosis of oral reading difficulties (Wiederholt and Bryant, 2001). Documenting student growth as a result of an intervention is an approved use for the GORT-4.

The GORT-4 has two parallel forms (A and B), each containing 14 developmentally sequenced reading passages with five comprehension questions about each passage. The results consist of oral reading scores on a) Rate - the amount of time taken by a student to read a passage; b) Accuracy - the student's ability to pronounce or read each word correctly with mis-pronounced and mis-read words noted as "deviation from print" and sometimes referred to as "miscues"; c) Fluency - the rate and accuracy scores combined; d) Comprehension - the appropriateness of the students' responses to questions about the content of each story read; and e) overall reading ability, which is determined by a combination of students' Fluency (Rate and Accuracy scores) and Comprehension scores.

On the GORT-4, raw scores range from 0 to 5 in each of the skills for each passage read. These scores are presented in a conversion table at the bottom of each

passage. Using this table, the rate at which the passage is read (in terms of the number of seconds it takes a student to read the passage) converts to a Rate Score that ranges from 0 to 5. Similarly, the number of deviations from print converts to an Accuracy Score that ranges from 0 to 5. The sum of the Rate Score and the Accuracy Score is the Fluency Score. The Comprehension Score also ranges from 0 to 5 for each passage, depending upon how many of the 5 comprehension questions are answered correctly. Basal scores determine the lowest level at which a student can read a passage with adequate fluency and comprehension. For example, it is recommended that students in grades 3 and 4 begin testing on story #3. If students establish a basal score on story #3, then it is assumed they would be able to read Story #1 and Story #2 with the same level of competency. Basals are established by a score of 5 on Comprehension or 9 or 10 on the Fluency Score. After the student reads the first story presented, testing continues with the student reading increasingly difficult passages until the student scores 2 or lower on the Comprehension and the Fluency Scores. This establishes the ceiling. (Note: if a basal level has not been established on the way to reaching the ceiling, the examiner should go back and establish the basal after the ceiling has been established.) After reaching a ceiling, the test examiner adds up the scores for each story to determine "total score" for Rate and Accuracy. These scores are combined to generate a total score in Fluency. Comprehension scores for all stories read below the ceiling are added to generate a total score in comprehension.

Tables provided at the back of the GORT-4 Examiner's Manual convert students' total scores for each skill category (Rate, Accuracy, Fluency and Comprehension) into Standard Scores that range from 1 to 20 with 10 set as the mean, and percentile ranks which range from <1 to >99 with 50 set as the mean. These Standard Scores are based upon the student's age at the time of testing. Fluency and Comprehension Standard Scores are added together to generate an overall Oral Reading Quotient (ORQ). According to the GORT-4 Examiner's Manual, the ORQ is "the best measure of a student's overall reading ability" (Wiederholt & Bryant, 2001 p. 35). The ORQ has a mean of 100 and standard deviation of 15. Score bands set performance levels. Scores of 90 to 110 are considered to be Average performance. Scores from 80 to 89 are considered Below Average. Scores from 70 to 79 are Poor, and scores below 70 are Very Poor. The GORT-4 Examiner's Manual provides tables for computing age and grade equivalents by calculating the average normative group score at each age interval and grade level. Therefore, students' total score points for each reading skill can be converted, using these tables, to grade-level equivalents.

The GORT-4 is a highly reliable instrument with high reliability on three measures of test error: content, time and inter-rater differences. Reliability scores ranged from .91 to .97 for Content Sampling, .94 to .99 for Scorer Differences and .86-.95 for Test-Retest. A score of 0.90 is considered a minimum standard for reliability, and the majority of coefficient alphas reported in the GORT-4 Examiner's Manual rounded to or exceeded 0.90 (Wiederholt & Bryant, 2001).

For the study presented in this dissertation, an educator who administers the GORT frequently for her work at a private reading therapy center gave the pre-test to two participants and instructed the researcher-teacher in the correct administration and scoring of the GORT-4. The researcher-teacher administered the remainder of the GORT-4 pre-tests and all post-tests.

To gain further evidence about the effectiveness of animal-assisted literacy instruction, data were collected and analyzed through the Basic Reading Inventory (BRI). At South Bay Elementary, the general education teachers administer the BRI to all students three times a year, allowing the researcher to collect BRI data at the correct time intervals for all research participants. The BRI provided data for the quasi-experimental aspect of the study's design, allowing the researcher to compare pre- and post-intervention growth for intervention and comparison students.

The BRI consists of grade-leveled passages that a student reads out loud to the teacher. Prior to reading the passage orally, the text is covered up and students are instructed to read the title silently, then predict what the passage will be about. The text is then uncovered and students are instructed to read the passage orally. A timer is set for 1 minute. While students read orally, teachers follow along on score sheets that have the text written on it. If the student mis-reads, adds or omits a word, these "miscues" are recorded on the score sheet. If a student self-corrects a miscue while reading, this is also recorded. If students finish reading the passage before one minute it up, they are instructed to go back to the beginning of the passage and

continue reading until the time is up. Following one minute of oral reading, the passage is covered up or removed, and students are asked comprehension questions about the passage that they just read. Teachers record the number of correct (or, at times, partially correct) answers.

To pass a grade-level on the BRI, students must meet benchmarks set by grade-level for words correctly read per minute, the number of acceptable miscues, and the number of correct answers to the comprehension questions. "Fluency" on the BRI is defined by the number of words correctly read per minute. To score for fluency, the teacher subtracts the number of uncorrected miscues from the total number of words read in a minute of oral reading. Self-corrected miscues are counted as correctly read words. The grade-level benchmarks for fluency are: 70 words per minute for 1st grade, 95 words per minute for 2nd grade, 110 words per minute for 3rd grade, 125 words per minute for 4th grade, and 147 words per minute for 5th grade. The benchmarks for accuracy and comprehension are the same for all grade-levels. For accuracy, the benchmark is a maximum of 4 uncorrected miscues during one minute of oral reading. The benchmark for reading comprehension at all grade levels is 80% or better (at least eight out of ten comprehension questions correctly answered following one minute of oral reading).

The BRI is administered fairly consistently at South Bay Elementary but there are some inconsistencies. For example, when determining which grade-level BRI to administer to a student, the general education teachers at South Bay Elementary

usually decide to use the level just above the last level the student "passed" for fluency, accuracy and comprehension. Sometimes, however, a level which was passed at the end of the previous school year is re-tested at the beginning of the next school year. There are also variations in terms of how many passages are presented to a student during one testing session. For some teachers, if a student meets the criteria to pass one level, then the next level is given and the student's scores for fluency, rate and comprehension are noted for the higher level even if grade-level benchmarks are not met during that testing session. Other teachers, however, do not present the next level after a student meets benchmarks for a given grade-level, especially if those benchmarks were met on a passage that is at the student's current grade-level. If a teacher does give the next higher grade-level passage and students do not meet the fluency expectations or if they make more than 4 miscues, then some teachers do not ask the comprehension questions for the higher grade-level. Other teachers do ask the comprehension questions for a passage on which the student did not meet fluency or accuracy benchmarks, especially if the student has an IEP reading goal that includes fluency benchmarks. (For students whose identified learning disabilities affect reading fluency, IEP reading goals may include fluency benchmarks that are lower than grade-level expectancies.) Each of these differences in test administration produces inconsistencies in the BRI results from one general education teacher to another.

Teachers at South Bay Elementary School administer the BRI every trimester (Fall, Winter, Spring). There is a "window" for testing that extends for 2 weeks.

Therefore, Fall tests may be administered in late October or early November. Winter tests may be administered in late February or early March. Spring tests may be administered in late May or early June. The researcher collected pre-intervention and post-intervention BRI scores on reading rate (termed "fluency" on the BRI), accuracy (number of miscues) and comprehension for all of the study participants (both intervention and comparison students). These scores were determined by the students' general education teachers.

Collecting data through pre- and post-intervention GORT-4 and BRI tests allows for a refinement of the first research question, which calls for studying the effectiveness of animal-assisted literacy instruction. A more detailed version of the question follows:

- (1) Does reading in the presence of a certified therapy dog increase reading performance measures on oral reading tests?
 - (1A) Does reading in the presence of a certified therapy dog increase reading fluency as measured by the Rate and Fluency scores on the GORT-4? Does it increase reading fluency as measured by words correctly read in a minute (wcpm) on the Basic Reading Inventory (BRI)?
 - (1B) Does reading in the presence of a certified therapy dog increase reading accuracy as measured by the Accuracy score on the GORT-4? Does it increase reading accuracy as measured by the number of uncorrected miscues made by students during the reading of a grade-leveled passage on the BRI?
 - (1C) Does reading in the presence of a certified therapy dog increase reading comprehension as measured by Comprehension scores on the GORT-4? Does it increase reading comprehension as measured by the number of comprehension questions that are correctly answered after reading a grade-leveled passage on the BRI?

The researcher-teacher considered it important to collect data on reading skills from both the GORT-4 and the BRI for three reasons. First, the GORT-4 provides standard scores while the BRI does not. Standard scores on such tests as the Woodcock-Johnson Tests of Academic Achievement are used to determine special education eligibility and have also been used to measure student progress on specific academic skills. Standard scores are familiar to special educators who may find the pre- and post-GORT standard scores valuable in terms of measuring the effectiveness of the intervention. In addition, GORT-4 standard scores can be converted to grade-level scores for ease of tracking growth. Standard scores converted to grade-level equivalents might show, for example, that the student made a net gain of 2 months in rate, 3 months in accuracy and 1 month in comprehension during 1 month of participation in the intervention.

The second reason for collecting data on both the BRI and the GORT-4 is to cross-reference scores for reliability. The GORT-4 was administered by the researcher-teacher, and the BRI tests were administered by the students' general education teachers. BRI results are independent of study bias while GORT-4 results may not be. However, BRI scores may be influenced by inconsistencies in test administration, which is not true of the GORT-4 results. The study will have a more reliable answer to the first research question if scores on both tests indicate similar results.

The third reason for collecting data for the study from both the BRI and the GORT-4 is that time constraints prevented the researcher from administering pre- and

post-GORT-4 tests to participants in the comparison group. Because the researcher is a full-time teacher and students' school days are fully scheduled with academic and extracurricular activities, it was not possible for the researcher-teacher to administer GORT-4 tests to comparison students. Nonetheless, under a quasi-experimental design, the analysis of both intervention and comparison students' BRI results can produce convincing evidence to answer this research question.

Studying Factors That May Mediate Reading Outcomes

The other study questions examine the intermediate effects that might explain how the presence of a certified therapy dog in the classroom can influence reading skills. The research questions are: (2) Does reading in the presence of a certified therapy dog increase students' motivation to read, (3) does reading in the presence of a certified therapy dog increase students' feelings of self-efficacy and confidence in their reading and (4) does reading in the presence of a certified therapy dog decrease students' feelings of anxiety about reading, including feeling of anxiety about reading out loud? As part of the case-study design, the plan for the data collection to answer these three questions varied in response to the study participants and context.

Data were collected pre- and post-intervention for all nine Intervention Group participants. The data sources included the Reader Self-Perception Scale, student interviews, reading journals, a researcher-made anxiety scale and parent questionnaires. Due to time constraints, these data were not collected from students

in the comparison group with one exception: four comparison group students provided data through the Reader Self-Perception Scale. (See Table 3.4, below.)

TABLE 3.3 Data Collection Plan

Data Collection Instrument	Data from Intervention Participants	Data from Comparison Participants
Basic Reading Inventory (BRI)	Collected from all intervention participants prior to starting the intervention and after its completion	Collected from all comparison participants at the same times as it was collected for each student's "matched" intervention student
Gray Oral Reading Tests, 4 th Edition (GORT-4)	Collected from all intervention participants both before and after the intervention	Not collected
Researcher-designed student interviews (Protocols in Appendix B)	Collected from all intervention students both before and after the intervention	Not collected
Researcher-developed reading journal (Example entry in Appendix C)	Collected from all intervention students following each intervention session	Not collected
Researcher-developed anxiety scale in reading journal (Scale in Appendix C)	Collected from all intervention students just before and after each intervention session	Not collected
Reader Self-Perception Scale (RSPS)	Collected from all intervention participants both before and after the intervention	Collected from 4 comparison students at the same times as these data were collected from their "matched" intervention students
Researcher-designed parent questionnaire (Protocol in Appendix D)	Collected from six intervention parents both before the intervention and after their child finished the intervention	Not collected

Studying intervention effects on motivation to read. Three sources of data collection were used to answer the second research question (2): Does reading in the presence of a certified therapy dog increase students' motivation to read? These sources were reading journals that were filled out by intervention participants after each reading session, pre- and post-intervention interviews and parent questionnaires.

The researcher designed the reading journals to collect data on how students experienced reading with the therapy dog. Composition books were used for these journals. At the start of each intervention session, prior to engaging in reading, the date and the title of the story to be read "to the dog" were recorded on a new page of the journal. After reading, students wrote 1 to 5 sentences about the reading session. There were no specific questions to answer, but the researcher-teacher encouraged students to write about how they experienced the reading session. For example, she encouraged them to write how it was to read to the dog, including whether or not they enjoyed it. The researcher-teacher told students they could note specific things that caught their attention during reading or comment about the story they had just read. Students could draw pictures if they wanted to do so.

At times students dictated their entries to the researcher-teacher. This was especially helpful for second and third graders whose written language skills were just emerging and for fourth grade student whose identified learning disabilities severely impacted their written language skills. When students dictated their responses, the researcher-teacher generally wrote just what the students said. If what

the student stated was not clear, the researcher-teacher asked "why?" or "what do you mean?" and then wrote down the prompt as well as the student's response. Some students, when dictating, became very animated and began to talk about reading at home or about other reading they were doing at the time. When this occurred, these statements were recorded in the journals as the students shared them, even though they did not pertain to the story just read. The open-ended design of the journal entries provided intervention students with an opportunity to write about their motivation to read if they chose to do so. (See Appendix B for a sample reading journal entry.)

The researcher-teacher conducted interviews with all nine intervention students prior to their participation in the intervention. The therapy dog had not yet begun to come to school when the Phase I interviews were held. With the exception of the pre-intervention interview with one student who participated in Phase II of the intervention and the student who participated in Phase III of the intervention, pre-intervention interviews occurred before the students had ever been in the presence of the therapy dog. Each interview lasted approximately ten minutes. Prompts were used consistently as scripted on the interview protocol (see Appendix C).

Interview questions designed to shed light on student motivation to read were both explicit ("Are there times when you really want to read something?" and implicit (tied in to enjoying reading). The first question, ("Are there times when you really want to read something?") was designed to open the conversation about reading and allow the

students to share about their desire to read. The researcher prompted students, ("Tell me what makes you want to read") to elicit specific examples if they were not clearly stated in the initial response. Expectations were that the second and third questions, ("Do you like to read?" and "Do you like to read out loud?") would shed light upon whether or not students perceived reading, and specifically oral reading, as an enjoyable activity. This perception could be linked to students' motivation to read since students who experience a negative emotional response to reading tend to read less (Magno, 2010).

Post-intervention interviews took place after 10 reading sessions with the therapy dog had been completed. The therapy dog was not present when the interviews took place. The post-intervention interview included the same questions that were asked in the pre-intervention interview plus three new questions that were specific to the intervention, including "Has reading with the therapy dog changed how you feel about reading?" No question explicitly asked whether the students were more motivated to read after the intervention, but the open-ended questions provided the opportunity for students to comment on changes in motivation arising from the intervention.

Parent questionnaires also provided data on motivation to read. There were questions specific to motivation on the questionnaires, including Question #3 ("Does your child ever feel motivated to read at home? If so, what motivates him/her to read?") Answers to Question #8 could indicate motivation, asking parents to indicate

"yes" or "no" regarding whether their child reads to him/herself, with a sibling, with a toy, with a pet or with the parent or another adult. Questions #4 and #5 are also associated with motivation ("How often does your child read at home?" and "How often does your child read **out loud** at home?") These questions offered the choices of "Never", "Once a week or less", "Twice a week or more", and "Daily" as responses. Answers to these questions could reflect parent motivation to have their child read at home rather than student motivation to read, and so there was also an open-ended question (#7 "Has your child ever talked to you about reading out loud? If so, what has he/she said?") This provided the opportunity for parents to share more about their child's motivation to read out loud. The post-intervention parent questionnaire included an open-ended question at the end where parents could note increased or decreased motivation to read. (See Appendix D for the Parent Questionnaire protocol.)

Studying intervention effects on reading self-efficacy and confidence. Four types of data were collected from intervention students to answer the third research question: (3) Does reading in the presence of a certified therapy dog increase students' feelings of confidence and self-efficacy in their reading skills? The sources used for data-collecting were reading journals, student interviews, parent questionnaires and the Reader Self-Perception Scale.

The open-ended design of the reading journals provided intervention students with the opportunity to write about their reading confidence as well as their motivation to

read. The procedure of eliciting journal entries was described earlier. Students dictating journal entries to the researcher-teacher, rather than writing the entries on their own, often said more about self-confidence because the students were freed from the demands of writing.

Intervention student interviews included questions on student confidence or self-efficacy about reading. (Procedures for interviewing students were discussed earlier). The "why" or "why not" prompts after Question #2 and #3 (asking respectively if students liked to read and to read out loud), elicited responses describing students' feelings of self-confidence about reading. Question #4 asked directly about perceived confidence in oral reading ("Is it harder for you to read out loud than silently?") Similarly, other questions indirectly provided opportunities for students to discuss their feelings of self-efficacy. Several post-intervention interview questions were added to shed more light on student self-confidence: (1) Do you think your reading has changed since reading with Kela? (If so) How? (2) Do you think reading with Kela has made you a better reader? (If so) How? (3) Has reading with Kela changed how you feel about reading? (If so) How? In addition, an open-ended question at the end of the post-intervention interview invited students to share "final thoughts about reading with Kela or about reading in general". In response, some students said more about how they perceived themselves as readers at that time.

Parent questionnaires included explicit questions about student self-efficacy and confidence in reading. Question #2 asked, "How confident do you think your child is

about his/her reading skills?" and parents could choose "Not at all confident", "Somewhat confident", "Confident" and "Very confident". Question #7 was an open-ended question asking if the student had ever talked about reading out loud and this provided an opportunity for parents to share about their child's feelings of confidence and self-efficacy regarding oral reading. Parents also wrote about their child's reading confidence on two other open-ended questions (#10 and #11) where parents could share about their child's feelings of self-efficacy regarding reading. There were also questions on the post-intervention parent questionnaire that inquired about whether parents thought the intervention had increased their children's confidence in and attitude about reading. Question #13 ("Do you think that reading with my therapy dog improved your child's confidence in reading?") and Question #14 ("Do you think that reading with my therapy dog improved your child's attitude about reading?") each offered four response options: "Not at all", "Not much", "Improved somewhat" and "Improved at lot!" (see Parent Questionnaire, Appendix D).

To gather more data about intervention effects on reading self-efficacy and confidence, the researcher administered the Reader Self-Perception Scale (RSPS) to all nine intervention students and to four of the comparison students both before and after the intervention. According to Henk & Melnick (1995), the RSPS is designed to measure students' feelings of self-efficacy about their reading ability. Based upon the theories of Albert Bandura, the authors describe self-efficacy as one's perceived ability to successfully engage in a given task (Henk & Melnick, 1995). The authors note that reading is a socially-situated activity, taking place in the context of home

and community as well as in the classroom. Therefore, self-efficacy is influenced by social feedback and by observing one's reading ability in comparison to others. There are two scales in the Reader Self-Perception Scale that focus specifically on observational comparison and social feedback. The social context within which reading occurs also influences how children perceive the progress they are making in reading and how they perceive their physiological states when reading. For this reason, items in all four scale categories include statements that reference reading at home in addition to reading in the classroom and reading in non-specific contexts.

The Reader Self-Perception Scale consists of one general item and 32 subsequent items that represent the four efficacy/confidence scales measured: Progress (how students perceive themselves to be progressing in their reading skills), Observational Comparison (how students perceive their reading compared to others), Social Feedback (how they perceive the feedback they receive about their reading from teachers, family and community members), and Physiological States (how they perceive their "internal comfort" when reading). These are the four basic factors the authors have determined contribute to feelings about self-efficacy in reading. Using a 5-point Likert scale, students are asked to respond to questions about their reading by circling the number next to each item that most closely matches their response. Responses are "Strongly Agree" (5 points), "Agree" (4 points), "Undecided" (3 points), "Disagree" (2 points) and "Strongly Disagree" (1 point). The number of items varies for each of the factors. There are nine items that are designed to assess perceived progress (a maximum of 45 points possible), six items about observational

comparisons (30 points possible), nine items pertaining to social feedback (45 points possible) and eight items on perceived physiological states when reading (40 points possible).

The RSPS has been normed to determine a mean score for each of the four scale categories. Scores that are more than 1 standard deviation from the mean are the "cut off" points for determining whether a student's scores are in the High, Average or Low range. The scales and performance levels differ according to the number of items on the RSPS scale. For example, the mean score for Progress is 39.4 with a Standard Deviation of 5.0. Therefore, scores of 44 and 45 are considered "High" and scores below 34 are considered "Low". On the Observational Comparison scale, the mean score is 20.9 with a Standard Deviation of 4.7. Scores of 26 or more are considered "High" while scores of 16 or below are considered "Low". Internal consistency has been evaluated. The Alpha reliability scores reported by the developers of the RSPS are .84 for Progress, .82 for Observational Comparison, .81 for Social Feedback and .84 for Physiological States (Henk & Melnick, 1995).

The RSPS takes 15 to 20 minutes to administer and may be administered one on one, in small groups or to an entire class at the same time. After working through the sample item and ensuring that the students understand how to use the Likert scale to reflect their responses, the students read and complete the test on their own. The students involved in my study, however, all have significant delays in their reading skills. Many of them also struggle with visual-perceptual and visual-motor skills,

which could affect their ability to correctly circle their responses. For this reason, the teacher-researcher read test items aloud to the second and third grade students who completed the RSPS and recorded their responses. When reading the items and recording responses, the researcher did not look up or give any reaction to the students' responses, including when asking students how they felt about reading to the teacher. The RSPS was designed for students in grades 4-6 to fill out the questions independently. Henk and Melnick (1995) noted they would caution against using the RSPS for students below the fourth grade "even if the items are read aloud to the students" (p. 476). Two of the intervention students were in second grade when they took the pre-RSPF and in third grade when they took the post- RSPS. One of the intervention students and one of the comparison students were in the third grade when they took both the pre- and post-RSPS. The rest of the intervention and comparison students were in 4th or 5th grade at the time that they were administered the RSPS and did not need assistance reading or responding to the questions.

Studying intervention effects on reading anxiety. Data from the student interviews, the reading journals, parent questionnaires, and the Physiological States scale of the RSPS were collected to answer the fourth research question: Does reading in the presence of a certified therapy dog decrease students' anxiety about reading? In addition, the researcher developed an anxiety scale to capture students' feelings about reading (and about reading out loud) prior to each reading intervention session.

The reading journals and the open-ended interview questions gave students two venues for commenting on their anxiety about reading. One post-intervention interview question ("Has reading with Kela changed how you feel about reading?") was designed to provide information about feelings of anxiety as well as feelings of self-confidence about reading. It encouraged students to reflect upon changes in their feelings about reading, including any perceived change in anxiety (increased or decreased) about reading.

The parent questionnaires did not inquire explicitly about student anxiety regarding reading, but the open-ended questions provided the opportunity for parents to discuss it, if it was evident to them. For example, Question #7 asks "Has your child ever talked to you about reading out loud? (If so), "What has he/she said?" Question #11 asks "Do you have anything else you'd like to add about your child's feelings about reading or about his/her reading habits?" When anxiety about reading was a concern for their child, parents wrote about it on the questionnaire.

The researcher developed an anxiety scale, called the Reading Anxiety Scale, for students to complete just before and immediately after reading to the therapy dog. Copies of the scale were glued into students' reading journals. The researcher developed the scale using faces that are modeled after the Faces Version of the Modified Child Dental Anxiety Scale (Howard & Freeman, 2007). The faces are simple circles with features demonstrating a range of feelings from very happy to

very sad (see Figure 3.1). The researcher's questions for the Reading Anxiety Scale were informed by "Questions to Gauge Reader Anxiety" (Zbornik, 2001).

Prior to reading (preferably prior to coming into the classroom and so without the student knowing whether reading would be done with or without the therapy dog present), the teacher-researcher read the three questions to the student. To answer each question, the student selected a face to represent how he or she was feeling and circled the corresponding number by the question. The questions were: How are you feeling right now; how do you feel about reading right now; and how do you feel about reading out loud? (See Figure 3.1, below.)

Anxiety Scale for Pre- and Post-Reading






					
1. How are you feeling right now?	1	2	3	4	5
2. How do you feel about reading right now?	1	2	3	4	5
3. How do you feel about reading out loud?	1	2	3	4	5

Figure 3.1 Anxiety Scale for Pre- and Post-Reading Sessions With the Therapy Dog

Pre-intervention responses were marked in gray graphite pencil. After reading, students were handed a colored pencil, the questions were asked again, and students

circled their responses in colored pencil. Every intervention student completed the anxiety scale both before and after each reading session with Kela.

After filling out the post-reading anxiety scale, students wrote, dictated or drew in their reading journals. The anxiety scale was not intended to influence what students wrote in their journals but some students did explain their circled responses on the anxiety scales in their journal entries. At times the researcher added a written explanation of the anxiety scale responses in the reading journals. For example, one student circled all crying faces prior to reading one day because she did not want to go with the researcher to read. She had been enjoying her P.E. class and even though the class was about to transition to independent silent reading, she did not want to leave. She did not enjoy reading out loud and was not aware that the therapy dog would be present for reading. After the reading session, she circled all #1 (happy faces), because she very much enjoyed reading in the presence of the therapy dog. The researcher then made a note in the journal to explain the crying faces prior to reading with the therapy dog (see Appendix B).

Data on student anxiety about reading were also collected through pre- and post-intervention responses to the questions on the Physiological States scale of the RSPS. The statements in this category of readers' self-perceptions are specifically designed to note whether students perceive themselves to be physically and mentally comfortable during reading (Henk & Melnick, 1995). Statements in this category include, "Reading makes me feel happy inside," "I like to read aloud," "I feel calm

when I read," and "I feel comfortable when I read." Although a lack of physical or mental comfort does not necessarily indicate the presence of anxiety, it can be an indication that the student experiences an unpleasant emotional reaction towards reading and this has been linked to anxiety about reading (Zbornik, 2001).

Data Analysis

The analyses conducted in this study produced both measured effects of the intervention and evidence about the role of student motivation to read, feelings of self-efficacy about reading and feelings of anxiety about reading as explanatory variables for the measured effects. The descriptions of the analyses below are again organized by research question.

Studying the Effectiveness of the Intervention

To answer research question #1 (Does reading in the presence of a certified therapy dog increase reading performance measures on oral reading tests?), pre- and post-intervention test scores were analyzed for the GORT-4 and for the BRI.

Gray Oral Reading Test (GORT-4) data analysis. To study the effectiveness of the intervention using the GORT-4, standard scores were analyzed for each student to determine whether individual students made net gains or losses in reading rate, accuracy, fluency, comprehension and on Oral Reading Quotients. Individual standard scores were then averaged to create mean pre-intervention and post-intervention measures so that mean gains or losses could be analyzed for the

intervention students as a group. Second, pre-intervention and post-intervention GORT-4 mean standard scores and pre-intervention and post-intervention Oral Reading Quotient scores were analyzed through a paired samples t-test procedure to determine whether the gains were statistically significant. Third, raw scores for individual students on both pre-intervention and post-intervention tests were converted to grade-level equivalencies and analyzed for net gains (or losses). This allowed the researcher to represent net differences in reading rate, accuracy, and comprehension in terms of monthly gains that could then be compared to the duration of student participation in the intervention.

Here is a hypothetical example of the utility of the grade-equivalent conversion. A student who has participated in 3 months of literacy instruction would be expected to demonstrate 3 months of growth in reading skills. If John (hypothetical student) was 8 years 8 months prior to intervention and had a raw rate score of 15 on the GORT-4 (Form A) prior to the intervention, this would convert to a standard score for rate of 7. If John's raw rate score after 3 months of intervention was 17 on the GORT-4 (Form B), this would convert to standard score of 8. This demonstrates growth, but the value of the intervention is difficult to interpret. By converting the raw scores to grade-level scores, it is clear whether the gain score exceeds what is typically expected. John's pre-intervention raw score of 15 (Form A of the GORT-4) converts to a grade equivalent of 2.2 (second grade + 2 months). After three months of receiving literacy instruction, his expected grade-level score would be 3 months higher so 2.5. But John's post-intervention raw rate score was 17, which converts to a

grade-level score of 2.7. Therefore during the intervention John made 5 months of growth in 3 months. The grade-level conversion of raw scores quantifies the growth in terms that are easy to understand and so provides more clarity on the GORT-4 results of the intervention.

Raw scores for all participating students were averaged to generate mean scores for reading rate, accuracy, fluency and comprehension on pre-intervention and post-intervention GORT-4 tests. These mean scores were converted to grade-level equivalencies. This allowed for clarity on the net gains in terms of grade-level equivalencies for the intervention participants as a whole.

Basic Reading Inventory (BRI) data analysis. The pre- and post-intervention scores on the Basic Reading Inventory (BRI) were analyzed in two ways to assess the effectiveness of the intervention. First, the pre-intervention and post-intervention scores for the Intervention Group were analyzed for net gains in fluency, accuracy and comprehension. Second, because the BRI was administered to both intervention and comparison students, group mean scores on pre-intervention tests and post-intervention tests (or for comparison students, BRI tests taken at the same time as their matching intervention students' tests) to determine if gains in reading fluency, accuracy and comprehension differed by group.

Comparing pre-test and post-test scores to determine net gains (or losses) in reading fluency (words correctly read per minute), accuracy (number of miscues made while reading orally for one minute) and comprehension for individual students

is the reason that general education teachers administer the BRI to all students. Looking at increases (or decreases) in these three specific reading skills gives an indication of whether or not an individual student is making expected progress in reading. Teachers examine changes in individual scores over time for student assessment, but this assessment of intervention effectiveness relies on changes in group mean scores (not individual scores) over time.

When analyzing changes in BRI mean scores, it is important to take into consideration whether or not the student read a more difficult passage on the BRI post-test than was read on the pre-test. As discussed in the description of data collection using the BRI, general education teachers who notice improvement in their students' reading skills or whose students "passed" a grade level on the previous BRI test will sometimes give a more difficult passage than was used for the previous trimester's test. There is no way to equate scores based on more difficult passages to account for the increase in difficulty, so changes in the difficulty of the BRI reading passage from pre-testing to post-testing is a factor in calculating and reporting group means.

Of the nine students in the Intervention Group, three read a more difficult passage on the BRI post-test than on the pre-test. Consequently this analysis produced two sets of mean scores for the Intervention Group. The first set consisted of the mean scores for fluency, accuracy and comprehension for all Intervention Group students, including those whose scores may have decreased slightly on post-intervention tests

due to having read a more difficult passage on the post-test than on the pre-tests. The second set contained the mean scores for those Intervention Group students who, like the Comparison Group students, read the same grade-level passage on the pre-test and post-test. Comparing pre-intervention and post-intervention mean scores for these students yielded another measure of intervention effects on reading fluency, accuracy and comprehension.

The second BRI analysis compared the mean gains of the Intervention Group and the Comparison Group. The difficulty of the BRI reading passage remained the same in both pre-tests and post-tests for all eight students in the Comparison Group, which generated just one set of mean scores for them. The analysis compared the mean gains of all Comparison Group students to the mean gains of all Intervention Group students; it also compared the mean gains of the six intervention students whose BRI passages were at the same difficulty level for both pre-test and post-test with the mean gains of the Comparison Group, all of whom read passages with the same level of difficulty in pre-tests and post-tests.

Studying Factors That May Mediate Reading Outcomes

To answer research questions #2, #3 and #4, an analysis was done on data collected through student interviews, student reading journals, the Reading Anxiety Scale, the Reader Self-Perception Scale (RSPS) and parent questionnaires.

Student interview data analysis. All students who participated in the intervention were interviewed prior to the intervention and again after completing it.

When interviewing, the researcher wrote student responses by hand. Hand-written interview responses were typed by the researcher prior to analyzing them. The pre-intervention and post-intervention interviews were analyzed by student for changes in reading behavior, including motivation to read, feelings of self-efficacy and confidence in their reading and anxiety about reading. Longer responses were coded following Saldana (2009) to examine why and how change occurred. Interview questions also elicited yes/no answers or numerical information that could indicate changes in student reading behavior (i.e., "How often do you read out loud?"). The researcher-teacher first noted such responses in terms of changed behavior for the individual student and then tabulated the numerical responses as a measure of change for the Intervention Group overall.

According to Saldana (2009), "a code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing and/or evocative attribute for a portion of language-based or visual data" (p. 3). Therefore, interviews were "pre-coded" by highlighting and underlining key words or phrases. Initial coding for individual pre- and post-interviews revealed key words such as "hard", "embarrassed", "mess up", "fun", "easier" and "enjoy". These words were organized into categories for each student in both pre- and post-interviews. Coding categories were derived empirically from working with the data.

The researcher-teacher compared coded responses from each student's pre-intervention and post-intervention interviews for signs of change. She then compiled

the pre-intervention coded responses and the post-intervention coded responses to look for evidence of group changes by question. The researcher-teacher coded a second time and re-categorized the codes into slightly broader categories, looking for both emergent themes and for evidence for the mediating variables in the research questions. According to Saldana (2009), a theme is "an outcome of coding, categorization and analytic reflection." (p. 13) Finally, the researcher searched for common themes across coded data from different sources.

Reading journal data analysis. Data collected through student writing in the reading journals were also coded by highlighting key words or phrases and organizing these codes into categories (Saldana, 2009). The researcher-teacher typed reading journal entries prior to analyzing them to facilitate coding. Again, after pre-coding by highlighting key words and phrases that seemed to be, "summative, salient, essence-capturing and/or evocative" (Saldana, 2009, p. 3) about how the students perceived the intervention, these key words or codes were grouped into categories. The journal entries were re-coded and themes were empirically determined. The researcher-teacher looked across data sources for emergent themes and for evidence of increased motivation to read, increased self-efficacy and confidence in reading and decreased anxiety about reading, especially reading out loud.

Reading Anxiety Scale data analysis. The researcher-teacher developed the Reading Anxiety Scale that was presented to students immediately before and after each intervention session to capture any change of feelings that might occur due to

reading with the therapy dog. Anxiety scale ratings were tabulated by question for pre-intervention and post-intervention responses. Participants' average pre-reading ratings for each question were compared with their average post-reading ratings and any change between pre-reading and post-reading rates were noted for individual students. In addition, mean pre-reading ratings for all participants were compared with the group's mean post-intervention ratings by question. This analysis of change in mean scores may be able to determine the scope of lowered anxiety in three ways: As general anxiety for the students (Reading Anxiety Scale Question #1), anxiety about reading in general (Question #2) and anxiety that is specific to reading out loud (Question #3).

Reader Self-Perception Scale (RSPS) data analysis. The Reader Self-Perception Scale was given to all Intervention Group students both before and after the intervention. It was also given to all Comparison Group students before the intervention but due to time constraints, only four Comparison Group students were able to complete the RSPS after the intervention. Scores were analyzed in three ways. First, pre- and post-test scores were compared to note net gains (or losses) in each scale category for Intervention Group students. Individual gains scores were averaged for the Intervention Group for each scale and post-intervention mean scores were compared to pre-intervention mean scores. Second, pre- and post-test mean scores in each category were compared to mean pre- and post-test scores for Comparison Group students. Third, pre- and post-RSPS scores were compared for "matched" pairs of intervention and comparison students.

It should be noted that the developers of the Reader Self-Perception Scale caution against its use for students who are below the 4th grade even if the items are read to the students. The caution exists because the test has not been normed below the 4th grade level and because students in lower grades do not "tend to appraise their reading ability accurately nor attribute the causes of their achievement properly" (Henk & Melnick, 2009, p. 471). Five of the Intervention Group students and one of the Comparison Group students were in the third grade when the researcher-teacher administered the Reader Self-Perception Scale. Therefore, a comparison of matched pairs was done using only those matched pairs of students where each member of the pair was in the 4th or 5th grade when they took the RSPS. There were three matched pairs where both the Intervention Group student and the Comparison Group student were in the 4th or 5th grade when they took the RSPS and therefore these three matched pairs were used for the "matched pair" analysis of the Reader Self-Perception Scales.

Parent Questionnaire Data Analysis

The parents of all intervention students were given a parent questionnaire both before and after their child's participation in the intervention. The parents of six intervention students returned both pre-intervention and post-intervention questionnaires. Some questions called for numerical responses about student behaviors (Question #4 "How often does your child read at home?" and Question #5 "How often does your child read out loud at home?") The researcher-teacher

tabulated the pre-intervention and post-intervention responses to examine change in reading behavior at home.

Parents' open-ended responses were coded, making special note of references to the intervention. The coding procedure (Saldana, 2009) was essentially the same as that used on the student interviews and reading journals (key words, first coding, second coding, themes, and comparison across data sources). Explicit comments about how parents perceived the intervention were noted in the analysis especially if comments mentioned the intervention in terms of its effect on their child's motivation to read, self-confidence in reading or anxiety about reading.

The Teacher As Researcher

Two of the participants (one in the Intervention Group and one in the Comparison Group) were taught by the other RSP teacher at the school. All of the other study participants were students of the researcher-teacher. There are challenges that are implicit with having the teacher as the researcher. First, the teacher is very much invested in the progress that the students make. While this includes all students who participated in the study (comparison and intervention students alike), the teacher is researching an intervention that he/she believes will be effective and this can subtly influence the results of the study. This has been termed "The Researcher Effect".

According to Draper (2012), the "Researcher Effect" can occur when the researcher's expectations about the result of an intervention affect the results of that intervention. Draper notes that the "researcher effect" has been found in educational

research. Teachers' expectancies about student performance have been shown to play a role in student outcomes (Rosenthal & Jacobson, 1966). This researcher-teacher has incorporated animals in her RSP classroom small-group instruction for many years and believes animals can be beneficial in terms of motivating students and creating a classroom climate that fosters growth for the students. Therefore, the researcher-teacher's belief in the intervention could have influenced the students who received the intervention and therefore affected the gains that have been shown on post-test data-collecting instruments.

Methodological Limitations

One major methodological limitation of this study is the small number of participants. Although seventeen students read with the therapy dog during the twelve months during which the study was conducted, only nine had the 10 reading sessions needed to complete the intervention. The eight other students were potentially available to participate in the study but could not complete the 10 sessions due to time constraints and therefore could not participate in the study as intervention or as comparison students. Because of the small number of intervention participants, any statistically significant differences between pre-intervention and post-intervention measures are suggestive for, but not necessarily generalizable to the elementary special education population. The small number of participants in the Comparison Group was also a limitation. Because there is a limited number of students in the school who receive special education support for identified delays in literacy

acquisition (and eight of these students read with the therapy dog but did not complete 10 reading sessions so could not be included in the study), only eight students participated in the Comparison Group.

A second methodological limitation was that intervention and comparison students were neither randomly assigned to a group nor thoroughly matched. Students were placed in one group or the other according to their availability to participate in the intervention given the scheduling challenges involved for both the researcher-teacher and the students. As a realistic alternative to random assignment, the researcher-teacher matched the students in the two groups by identified learning disability and grade. It was not possible to match the groups by gender because there were five female students in the Intervention Group but only one female student in the Comparison Group students. Therefore, only five of the eight "matched pairs" are matched in terms of gender. The pairs were matched primarily by identified learning challenge, although even within identified learning disabilities, there are variations and differences. No two students are exactly alike which is why no two IEPs are exactly alike. Therefore, "matching" two students for the study was very difficult, especially given the limited number of special needs students enrolled in the school.

The time that was available to implement the intervention constituted a third limitation. The study required approval not only for human participation but also for animal participation, and securing this approval delayed the start of the study for months. Phase I of the study could not begin until May 10th and this allowed only 5

weeks to implement the study before the school year ended. Ten students participated in the intervention during Phase I of the study, but some of them had general education activities that prevented them from completing the required 10 reading sessions with the therapy dog. So Phase II of the study was from October 8 until December 13th the following school year. In November, one new student qualified to receive special education support due to identified learning disabilities that were determined to impact her acquisition of literacy skills. This student joined the Intervention Group. The study had to continue until March 2013 so that this student could have 10 reading sessions with Kela. It would have been more consistent to have just one intervention period with 10 reading sessions for all intervention participants for a single period of time.

Opportunities to collect data from Comparison Group students were limited and constituted a fourth methodological limitation. It was the intent of the researcher-teacher to collect similar data from both comparison and intervention students. Having data from all instruments and from sources such as interviews, journals and parent questionnaires for both sets of students would have allowed the researcher-teacher to compare the two groups of students thoroughly. However, given the time constraints of full-time teaching for the researcher-teacher and fully scheduled days for the students, the opportunities for collecting data from comparison students were very limited.

Two other factors, the "halo effect" and the "placebo effect", may have influenced the outcomes of the study. The novelty of the intervention may have played a part in the Intervention Group students' enthusiasm for the intervention and thereby affected the intervention outcomes. Sometimes referred to as the "halo effect" (Draper, 2012), a novel intervention may improve performance simply because it is novel and therefore interesting to the participants. It was definitely a novel experience for intervention students to read in the presence of a therapy dog. Some of them documented this in their journals and post-intervention interviews (i.e., "it was fun because I never read to a dog before!"). Similarly, the "placebo effect" occurs when a promising intervention creates a real result even though the intervention is neutral in its ability to affect outcomes (Draper, 2012). If measured gains in reading skills were due to the "placebo effect", then the reason for the gain in students' scores on post-tests would be due to student belief in the intervention rather than due to the intervention itself. Many of the Intervention Group students mentioned, in reading journals and post-intervention interviews, that they believed reading with the therapy dog had improved their reading. Either the "halo effect" or the "placebo effect" may have contributed to the intervention results in undetectable ways.

One final methodological limitation must be addressed: there is a cultural component to children's reactions to animals, particularly reactions to dogs. In some cultures and communities, dogs are not a comforting presence. Even within cultures and communities where dogs are held in high esteem, there are families and individual children who do not hold high esteem for dogs. The children who

participated in the Intervention Group for this study all expressed, in pre-intervention interviews, either a neutral feeling about dogs or an affection for dogs. For children who are afraid of dogs or dislike dogs, this intervention would likely not provide the same results as were found for the children who participated in this study.

Ethical Considerations

Whenever research involves human subjects and particularly if those human subjects are children, one must ensure that the subjects are treated humanely and no harm is done to the children physically, mentally or emotionally. With this study, it was imperative that all participating children were free of allergies to dogs and did not have a fear of dogs. Permission was granted by the parents for all children who participated in the study, with the option provided for the participants to leave the study at any time for any reason.

The dog used in this study is certified as a therapy dog through Therapy Dogs International (TDI). Certification through TDI mandates a thorough veterinary examination annually to provide verification that the dog is healthy, free of parasites and has all shots updated. TDI certification also includes verification of basic obedience training and an evaluation by a TDI trainer to verify that the dog's temperament meets the criteria for therapy dog certification. Additionally, care was taken throughout the time that the dog participated in the study to ensure that the dog was properly groomed, including nails clipped, so children would not be accidentally scratched by the dog.

Another ethical consideration of this study is the proper treatment of the therapy animal that was used for the study. When the therapy dog was on campus, the well-being of the dog was important. Water was provided at all times, toileting needs for the dog were met and a "safe place" was provided (under the researcher's desk), where the dog could comfortably rest when she was not actively engaged with the students. Both the Institutional Animal Care and Use Committee (IACUC) and the Institutional Review Board (IRB) of the University of California, Santa Cruz approved this study.

CHAPTER 4: RESULTS

Results for this study are reported according to the research questions that have been posed. First, evidence about the effectiveness of the animal-assisted literacy instruction in terms of student scores on oral reading tests is reported. This includes Intervention Group students' scores on the Gray Oral Reading Test results, comparing changes in reading rate, fluency, accuracy and comprehension in terms of mean standard scores and in terms of mean grade-level scores. It also includes Basic Reading Inventory (BRI) scores for both Intervention Group and Comparison Group students. Next, results are reported for measures of the intervention's effects on students' self-confidence and anxiety. In this section, results are presented on Pre- and Post-Reader Self-Perception Scale (RSPS) scores and on the Anxiety scales that were filled out before and after each reading session. Then results are reported on data collected to answer the research questions about the intervention's effects on students' self-confidence, anxiety and motivation to read. This includes data collected through student reading journals, pre- and post-intervention interviews, and through parent questionnaires.

Measures of Intervention Effects on Oral Reading Test Scores

Results for Gray Oral Reading Test (GORT-4)

All participants in the Intervention Group were administered the Gray Oral Reading Test (GORT-4) prior to receiving the intervention and again following the intervention. Below are the mean standard scores for the Intervention Group Students

on pre- and post-GORT-4 tests. Standard Scores for rate, accuracy, fluency and comprehension range from 1-20 with 10 considered to be exactly average. For the Oral Reading Quotient (ORQ) scores range from 1-200 (100 is considered to be the population mean and 15 is the standard deviation). In Table 4.1 (below) the mean standard scores for each reading skill, pre-intervention and post-intervention, are presented, along with mean grade-level equivalencies. Also reported in Table 4.1 are the results of the paired samples t-tests that were conducted to determine if there was a statistically significant difference in the pre-intervention and post-intervention standard scores for the individual reading skills and between the pre-intervention and post-intervention Oral Reading Quotients.

Table 4.1 GORT Pre-Intervention and Post-Intervention Mean Scores and Paired Samples T-Test Scores for Intervention Group

GORT-4 Reading Skills Measured	GORT Pre-test Mean Standard Score (Standard Deviation)	GORT Post-test Mean Standard Score (Standard Deviation)	GORT Pre-test Mean Grade-level Equivalent	GORT Post-test Mean Grade-level Equivalent	t value	Sig 2-tailed p value
Rate	5.44 (2.18)	7.22 (2.33)	1.7	3.2	-3.600	.007
Accuracy	5.66 (1.80)	9.0 (1.58)	2.0	3.7	-4.851	.001
Fluency	5.0 (1.87)	7.88 (2.08)	2.0	3.2	-4.411	.002
Comprehension	7.44 (1.59)	9.33 (1.32)	2.7	4.0	-7.249	.000
Oral Reading Quotient	77.5 (10.46)	91.66 (9.22)			-5.382	.001

Comparing post-intervention test scores with pre-intervention test scores, there is a measurable increase in standard scores in all reading skills that were measured. A paired samples t-test was conducted to compare GORT-4 pre-test scores with GORT-4 post-test scores. The t-test scores indicate there was a statistically significant difference in the scores on the pre-test and the scores on the post-tests for all reading skills measured: rate, accuracy, fluency and comprehension.

The Oral Reading Quotient is determined through the sum of the Fluency and Comprehension scores obtained on the GORT-4 and is considered to be "the best measure of a student's overall reading ability" (Wiederholt & Bryant, 2001, p. 35). Prior to the intervention, Intervention Group ORQ scores ranged from 61 to 99 with a mean Intervention Group score of 77.5 (Poor). Only one Intervention Group student had an Oral Reading Quotient in the average range prior to participating in the intervention. Following the intervention, five students had ORQs in the Average range. The mean post-intervention ORQ score was 91.66 (Average range).

A paired samples t-test was conducted to compare pre-intervention mean Oral Reading Quotients with post-intervention mean Oral Reading Quotients. There was a significant difference in the scores on the pre-intervention tests ($M = 77.5$, $SD = 10.46$) and post-intervention tests ($M = 91.66$, $SD = 9.22$), $t = -5.382$, $p = .001$. These results suggest that the increase in ORQ scores was highly unlikely to have occurred by chance and that the intervention contributed to the increase in students' Oral Reading Quotients.

GORT-4 Data by mean grade-level scores. All of the students who participated in the intervention were administered pre-intervention GORT-4 tests and were administered post-GORT-4 tests after 10 intervention sessions had been completed. Pre-test standard scores, when compared to post-test standard scores on the GORT-4 show evidence of gain as reported in the previous section. The gains have been found to be statistically significant according to the paired samples t-test that were conducted (see previous section). But the scope of the gains are better understood when the raw scores for each reading skill are converted to grade-level scores.

Grade-level scores convert to year and month scores (i.e., 2.5 is second grade, 5 months). When analyzing the effectiveness of the intervention, the difference between the pre- and post-test grade-level scores in terms of months was compared with the length of the intervention in terms of months. The objective was to see if students made month-for-month gains in reading skills, greater than 1 month's gains in reading skills for each month of intervention or less than 1 month's gain in skills for each month of intervention. This provided the researcher-teacher more detailed information about whether or not the intervention contributed to an increase in reading rate, accuracy, fluency and comprehension for individual students compared to expected gains for the time during which students participated in the intervention.

All students received 10 intervention sessions. The amount of time between pre- and post-tests varied. Therefore, all of the students' times between pre- and post-tests were averaged to create a mean of 4.9 months during which students participated in

the intervention. The Standard Deviation for the length of time for the intervention is 2.6 months. Therefore it would be expected that students would make mean growth increases of 4.9 months between pre- and post-tests.

To determine whether students made increases in their reading skills of 4.9 months over the course of the intervention, all individual raw scores for each reading skill measured were averaged to create mean scores for the Intervention Group as a whole for each reading skill (rate, accuracy, fluency and comprehension). These mean scores did not take into account the varying lengths of time over which the students participated in the intervention. Mean scores for each reading skill were converted to grade-level scores. Pre-intervention mean scores were based upon the conversion table for Form A and post-intervention mean scores were based upon the conversion table for Form B (see GORT Pre-Intervention and Post-Intervention Mean Grade-Level Equivalencies in Table 4.1, above.).

In all phases of the intervention, students made greater gains on post-intervention tests than would be expected given the length of time between pre-tests and post-tests. The difference in mean grade-level scores between pre-tests and post-tests ranged from 1.2 years in reading Fluency to 1.7 year's growth in Accuracy. This is far beyond the growth that would be expected for students who received 10 guided oral reading sessions with the therapy dog over 7 months or less. Although Table 4.1 shows mean scores, all Intervention Group students made greater gains than would be expected in all skill areas. For example, there were two students who completed 10

intervention sessions in one month during Phase I of the intervention. Of these two students, one student gained seven months in reading rate, accuracy and fluency. This student gained over a year's growth in comprehension as measured by pre- and post-testing on the GORT-4. The other student who completed 10 intervention sessions in one month gained two months or more for each measured reading skill (rate, accuracy, fluency and comprehension). The student who completed 10 intervention sessions in 3.5 months gained seven months or more on post-tests for each reading skill. Therefore, the mean scores presented in Table 4.1 are an accurate reflection of the growth that was made by individual students who participated in the intervention.

Results of Basic Reading Inventory (BRI) tests

The results of the Basic Reading Inventory (BRI) provide additional evidence that the intervention was effective in increasing Intervention Group students' reading skills. Because the BRI was administered by students' general education teachers and not by the teacher-researcher, pre- and post-intervention BRI scores lend credibility to the gains that were measured through pre- and post-testing on the GORT-4. All students in the Intervention Group demonstrated significant gains in reading rate, accuracy, fluency and comprehension as measured by pre-intervention and post-intervention GORT-4 tests. All students who participated in the intervention also made measured gains in these reading skills when tested on the BRI by their general education teachers. Individual student pre-test and post-test scores on the BRI show

very similar gains for individual students as those that were measured on the GORT-4. However, no individual BRI scores are reported here. For the purposes of this study, the results for the BRI are reported as mean scores for the Intervention Group as a whole and for the Comparison Group as a whole.

As mentioned previously, the researcher was not able to obtain Comparison Group scores on the GORT, which would have provided quasi-experimental evidence of the effects of the therapy. However, the Basic Reading Inventory (BRI), a common reading assessment used in elementary schools, is administered every trimester by the third, fourth and fifth grade general education teachers at South Bay Elementary School. It is given to all students, general education and special education alike, to determine progress in reading fluency (as measured by the number of words correctly read in 1 minute of oral reading), accuracy (as measured by the number of uncorrected miscues made during a minute of oral reading) and comprehension (as measured by the number of correct responses to 10 post-reading comprehension questions). Because the BRI is administered by individual teachers who have not been calibrated to ensure inter-rater reliability, analyzing the difference between the Intervention Group BRI scores and Comparison Group BRI scores offers a weak but important test of this study's Research Question #1. In light of this, the following discussion of the BRI scores obtained by general education teachers for the Intervention Group and Comparison Group students is considered a form of narrative analysis rather than a strict quasi-experimental test of the research question.

When general education teachers administer the BRI, their decision regarding which grade-level passage to administer to a student is based upon both an observational assessment of the student's current reading level and the scores the student received on the previous trimester's BRI assessment. There are grade-level benchmarks for reading fluency (95 words per minute for second grade, 110 words per minute for third grade, 125 words per minute for fourth grade, 147 words per minute for fifth grade), for accuracy (no more than 4 miscues in one minute of oral reading at any grade-level) and for comprehension (a minimum of 80% correct answers on comprehension questions is needed to pass any given grade-level). Students who do not meet grade-level benchmarks in any of the three skill areas are often not tested on the next grade-level passage by their general education teachers and their assessment cards are marked to indicate the highest level that they were able to meet benchmarks in all skill areas. Students with identified learning challenges, however, tend to make more miscues when reading than their non-disabled peers. This not only impacts their accuracy, but also impacts their fluency (especially when they take the time to self-correct their miscues). Therefore, students with identified learning challenges have difficulty meeting grade-level benchmarks for fluency and accuracy and so are given the same grade-level passage by their general education teachers until they are able to meet all grade-level benchmarks for that grade-level.

Due to a lack of meeting grade-level benchmarks on the previous trimester's BRI assessment, most of the students who participated in the study were administered a passage of the same grade-level for both pre- and post-tests (Form A for pre-tests and

Form C for post-tests). However, some of the students in the Intervention Group had made noticeable gains in their reading skills over the trimester during which they participated in the intervention and therefore their general education teachers chose higher grade-level passages for them to read on Post-test BRIs. This occurred for three of the nine Intervention Group students. The BRI manual does not indicate that there is a way to convert scores on higher grade-level passages to what might be earned on lower grade-level passages. Since none of the Comparison Group students read a higher grade-level passage on post-tests than they had read on pre-tests, the mean scores for the pre- and post-BRI tests are presented two ways (a) mean scores for all of the Intervention Group students, including those who read higher grade-level passages on post-tests and (b) mean scores for all of the Intervention Group students who, like the Comparison Group students, read the same grade-level passage on post-BRI tests as they had read on pre-BRI tests.

Both Intervention Group and Comparison Group students made gains in reading fluency (number of words read per minute), accuracy (fewer miscues made in a minute of oral reading) and comprehension. The Intervention Group students made greater gains in all reading skill areas. It is important to note that the pre-BRI mean scores for the Comparison Group tended to be higher than the pre-BRI scores for the Intervention Group students in fluency, accuracy and comprehension. The Intervention Group students made greater gains and this is reflected both for those students who read more difficult passages on post-BRI tests and for those students who, like the Comparison Group students, read a passage at the same grade-level on

post-tests as they had read on pre-tests. Post-test BRI mean scores are similar for Intervention Group and Comparison Group students in terms of accuracy and comprehension. All students in both groups met benchmarks for accuracy and comprehension on post-tests. Post-test BRI fluency scores were higher for Intervention Group students who, like the Comparison Group students, read passages of the same grade-level on post-tests as they had read on pre-tests. (See Table 4.2 below.)

Table 4.2 Pre- and Post- Mean BRI Scores and Net Gains or Losses

Student Group	Pre BRI Fluency (wcpm)	Post BRI Fluency (wcpm)	Pre BRI Accuracy #miscues	Post BRI Accuracy #miscues	Pre BRI Comprehension	Post BRI Comp.
Intervention Group Total (9)	70.8 wpm	94.6 wpm 23.8 wpm net gain	3.8 miscues	2.4 miscues 1.4 fewer miscues	82.5% Comp.	94% Comp. 11.5% net gain in comp
Intervention Group Same GL read pre- and post-test (6)	71.3 wpm	102 wpm 30.7 wpm net gain	4 miscues	1.7 2.3 fewer miscues	80% mean comp.	94.28% 14.28 % net gain in comp
Comparison Group Same GL read pre- and post-test (8)	84.75 wpm	95.25 wpm 10.5 wpm net gain	2.1 miscues	1.5 miscues .6 fewer miscues	88.12% mean comp.	94.37% mean comp 6.25% net gain

Of the Intervention Group students, eight out of nine students increased the number of words read per minute. Three out of nine students read a more difficult passage on the post-test than they had read on the pre-test. Two of these three students increased in words correctly read per minute in spite of reading a higher grade-level passage on the post-test while one student decreased the number of words read per minute due to reading a higher grade-level passage on the post-BRI test. In the table (4.2, above), the scores of those students who read more difficult passages on post-BRI tests are included in the mean scores for the Intervention Group as a whole.

In **fluency** (as measured by words correctly read per minute) on the BRI, Intervention Group participants gained an average of 23.8 words correctly read per minute after participating in the intervention while comparison students gained 10.5 words per minute. The Intervention Group students made greater gains in words read per minute even though three of the nine Intervention Group students read a more difficult (higher grade-level) passage on the post-test than they had read on the pre-test and none of the Comparison Group students read higher grade-level passages on post-tests than they had on pre-tests. When comparing only those Intervention Group students who did not read a higher passage on the post-test than on the pre-test, the net gain in words read per minute is 30.7 more words per minute read on post-tests. This is compared to 10.5 words per minute increase on post-tests for the Comparison Group students (all of whom also read passages on the post-tests that were the same grade-level as the passages they read on the pre-tests).

In **accuracy**, Intervention Group students averaged 1.4 fewer miscues on post-tests than on pre-tests. Comparison Group students averaged .625 fewer miscues on post-tests than on pre-tests. The Intervention Group students averaged fewer miscues on post-tests even though three of the Intervention Group students read more difficult passages on the post-test than on the pre-test while no Comparison Group students read more difficult passages on the post-tests than they had read on pre-tests. When comparing just those Intervention Group students who, like all Comparison Group students read a passage of the same grade-level on post-tests as on pre-tests, the net mean gain in accuracy is 2.3 fewer miscues for the Intervention Group students compared to .625 fewer miscues for Comparison Group students.

Of the Intervention Group students, six out of nine (66%) made fewer miscues on post-tests than on pre-tests and two made the same level of miscues on post-tests as on pre-tests. Only one student made more miscues on post-tests than on pre-tests. The student who made more miscues on post-test BRI passages than on pre-test BRI passages read a higher grade-level passage on the post-test (a Pre-Primer level passage was read for the pre-test while a 1st grade passage was read for the post-test). It is important to note this because fluency, accuracy and comprehension may go down for students when they read a more difficult passage, but overall-reading skills have improved to the point that the student is able to read (and comprehend) a passage that is higher than the level that they were able to read when the pre-test was given. For the Comparison Group students, three out of eight (37.5%) decreased the number of miscues made on post-tests while three students showed no change in the

number of miscues made and two increased the number of miscues made on post-tests although they were not reading higher grade-level passages on the post-test than they had read on their pre-tests.

In **reading comprehension**, both Intervention Group and Comparison Group students showed an increase in comprehension. Participants in the intervention demonstrated a greater increase in comprehension with an average increase of 11.5% compared to an average increase of 6.25% for students in the Comparison Group. The increase in comprehension skills for the Intervention Group students is accompanied by an increase in the level of difficulty of the passages that were read on post-tests for three of the Intervention Group students. The average increase in comprehension skills for the Comparison Group students is not accompanied by an increase in the level of difficulty of the passages that were read for post-tests. When comparing pre- and post-comprehension scores for only those Intervention Group students who read the same grade-level passage on post-tests as was read on pre-tests, the net gain for Intervention Group students is 14.28% compared to 6.25% for students with similar disabilities who also read same grade-level passages on post-tests and did not receive the intervention.

Six out of the nine (66%) Intervention Group students increased their reading comprehension on post-tests. Two of these students increased in comprehension in spite of reading a more difficult passage on the post-test. Two of the nine students in the Intervention Group scored 100% in comprehension on BRI pre-tests and so there

was no room for improvement on post-tests (although one student went from 100% to 85% comprehension on the post-test because the post-test passage was a higher grade-level). All of the six Intervention Group students who did not score 100% on pre-tests made improvements in their comprehension on post-tests. Two of these six students made modest gains, going from 90% comprehension on pre-tests to 100% comprehension on post-tests. Three of them made significant gains, going from below-passing levels on pre-tests (two scored 65% on pre-tests and one scored 70% on pretests) to scoring 90-100% on post-tests. One student made dramatic gains, going from 40% in comprehension on the pre-test to 95% comprehension on the post-test. All of Intervention Group Students met comprehension benchmarks on post-tests compared to just 60% who made comprehension benchmarks on BRI pre-tests.

Of the Comparison Group students, four out of eight students (50%) showed increases in comprehension scores on post-tests. All of the Comparison Group students met comprehension benchmarks on pre-tests as well as on post-tests and two of the students scored 100% in comprehension on pre-tests as well as on post-tests so no improvement could be made in comprehension scores by those two students. For all students, both Intervention Group students and Comparison Group students, post-BRI comprehension scores met the benchmark (80% or better) for the grade-level passages that were assessed by the students' general education teachers for post-BRI tests.

Summary of GORT and BRI Results

(1A) Does reading in the presence of a certified therapy dog increase reading fluency as measured by the "rate" and "fluency" scores on the Gray Oral Reading Test? Does it increase fluency as measured by words correctly read per minute on the BRI?

Rate: All nine Intervention Group participants demonstrated increases in their Rate scores on the Gray Oral Reading Test (GORT-4) as measured by an increase in standard scores and by increases in grade-level scores when compared to the length of the intervention. There was a significant difference in the mean scores for rate on the pre-tests ($M=5.44$, $SD = 2.19$) and the mean scores on the post-tests ($M=7.22$, $SD = 2.33$), $t=36$, $p=.007$. This suggests that the increase in standard scores for the rate of reading was highly unlikely to have occurred by chance. Grade-level score net gains for rate ranged from 2 months net gain (after 1 month of participation in the intervention) to 1.8 years net gain in rate (after 7 months between pre- and post-tests). Mean scores for the Intervention Group demonstrate 1.5 year's net gain over the course of the intervention.

Fluency: All nine Intervention Group participants demonstrated increases in their Fluency score on the GORT as measured by an increase in standard scores as well as by an increase in grade-level scores. In the paired samples t-test for Fluency, there was a significant difference in the mean standard scores for Fluency on pre-tests ($M=5.0$, $SD = 1.87$) and the mean standard scores on post-tests ($M= 7.88$, $SD = 2.0$), $t = 4.41$, $p = .002$. This suggests that the increase in fluency on post-intervention tests

was highly unlikely to have occurred by chance. Comparing pre- and post-intervention grade-level scores, increases in fluency ranged from an increase of 3 months following 2 months of intervention to a an increase of 1.4 years following 7 months of intervention. Mean scores for the Intervention Group demonstrate net gains of 1.2 years over the course of the study (which had a maximum time of 7 months between pre- and post-tests and a mean intervention time of 4.9 months).

All participants in the study increased their Fluency scores on the BRI (as measured by the number of words correctly read in one minute of oral reading). Increased fluency on the BRI was greater for students who received the intervention. Average increase was 23.8 more words correctly read per minute for students who participated in the intervention while average increase was 10.5 more words correctly read per minute for students in the Comparison Group. For Intervention Group students who, like the Comparison Group students, read passages at the same grade-level on post-tests as they had read on pre-tests, the average increase was 30.7 words per minute compared to 10.5 words per minute for Comparison Group students.

Research Question (1B) Does reading in the presence of a certified therapy dog increase reading accuracy as measured by the "accuracy" score on the GORT? Does it increase reading accuracy as measured by the number of uncorrected miscues made during the reading of a grade-leveled passage on the BRI?

Accuracy: All nine Intervention Group participants increased their reading accuracy according to pre- and post-intervention scores on the GORT. A paired samples t-test found a significant difference between pre-test mean scores ($M = 5.66$, $SD = 1.80$)

and post-test mean scores ($M = 9.00$, $SD = 1.58$), $t = 4.85$, $p = .001$. This suggests that the measured increase in Accuracy was highly unlikely to have occurred by chance. When comparing pre- and post-intervention grade-level scores, average increases in Accuracy ranged from an increase of 7 months (after 1 month of intervention), to an increase of over 2 years in accuracy (after 7 months of intervention). Mean scores for the Intervention Group for Accuracy was 1.7 years net gain over the course of the study (which was 1 to 7 months with a mean intervention time of 4.9 months).

Accuracy also improved according to the BRI tests administered by participants' general education teachers. Seven of the nine Intervention Group participants showed decreased miscues on the BRI following participation in the intervention while three out of eight comparison students showed decreased miscues on the BRI after the same amount of time. The average number of miscues made during 1 minute of oral reading was reduced by 1.4 for the Intervention Group students as a whole and by 2.3 for those students who read the same grade-level passage on both pre- and post-tests. The average number of miscues made during 1 minute of oral reading was reduced by .625 for the Comparison Group students, all of whom read the same grade-level for the passage they read on post-tests as had been read on pre-tests.

(1C) Does reading in the presence of a therapy dog increase reading comprehension as measured by correct answers given to inferential and factual questions presented following the reading of grade-leveled passages on the

GORT and on the grade-leveled passages read for the Basic Reading Inventory test?

Comprehension: All nine Intervention Group participants increased in their reading comprehension skills as measured by pre-intervention and post-intervention tests on the GORT-4. A paired samples t-test was conducted and found a significant difference in the mean standard scores on pre-tests ($M = 7.44$, $SD = 1.59$) and the mean standard scores on post-tests ($M = 9.33$, $SD = 1.32$, $t = -7.249$, $p = .00$). This suggests that the increase in comprehension as measured by pre- and post-testing was highly unlikely to have occurred by chance. Grade-level score increases for individual students ranged from 9 months' growth (after 7 months between pre- and post-tests) to 1.5 year's growth in comprehension for students who received the intervention for 1 month. Mean scores for the Intervention Group as a whole show 1.3 year's gain in comprehension over the one to seven months during which students participated in the intervention.

On the BRI, six out of the nine Intervention Group participants increased their comprehension scores in terms of an increase in the percentage of correct answers given following the reading of grade-leveled passages. On the BRI, 80% is considered benchmark. On post-BRI tests, all nine of the Intervention Group participants scored 80% or better on post-comprehension tests. It is noteworthy that, for three of these students, they were reading a passage that was one to three grade-levels above the passage they read on the pre-BRI test. Mean gain in comprehension for the Intervention Group students was 11.5% for the group as a whole and 14.28%

for those students who, like the Comparison Group students, read a passage of the same grade-level on post-tests as had been read on pre-tests. Average gain in comprehension for the Comparison Group students was 6.25%.

In every measure of reading skill, on both the Gray Oral Reading Test and on the Basic Reading Inventory, the students who participated in the intervention made measurable gains in reading rate, accuracy, fluency and comprehension. Scores on the BRI show that Intervention Group students made greater gains than their peers in the Comparison Group who received guided oral reading sessions with the researcher-teacher but did not participate in the intervention.

Measures of Intervention Effects on Self-Confidence and Anxiety

To measure the possible effects of the intervention on student feelings of self-efficacy and confidence, the Reader Self-Perception Scale was administered pre- and post-intervention to all Intervention Group students and to four of the Comparison Group students. To measure intervention effects on Anxiety, students filled out researcher-made Anxiety Scales prior to and immediately after each intervention session. The results of the data collected by those instruments are presented in the following section.

Reader Self-Perception Scale (RSPS)

The results of data collected through the Reader Self-Perception Scale are reported first for the Intervention Group, then for those Comparison Group students who were

able to take both a pre-RSPS and a post-RSPS. This is followed by the results for the "matched pairs" of students who were able to take both the pre-RSPS and the post-RSPS. In presenting the scores for the Intervention Group and Comparison Group, individual scores were averaged to generate mean scores. The mean scores on the pre- and post-tests are presented with net gains or losses reported for each category that is measured by the RSPS (General Perception, Perceived Progress, Perceived Observational Comparison, Perceived Social Feedback and Perceived Physiological States). To help to clarify the meaning of the scores, the values that are given on the RSPS score sheet are noted next to each mean score. The cut-off point for "Low", "Average" and "High" varies from category to category depending upon the total number of items that were presented for each category and depending upon the norms that were generated by the developers of the RSPS (Henk & Melnick, 1995).

The mean results for the Intervention Group students are reported in Table 4.3.

Table 4.3 Reader Self-Perception Scale Mean Scores
Intervention Group Students

Reader Self-Perception Scale Category	Intervention Group Pre-test mean score	Intervention Group Post-test mean score	Net difference
General Perception	3.7	4.7	+1.0
Perceived Progress	32.9 Low	41.8 Average	+8.9
Perceived Observational Comparison	18.3 Low	22.3 Average	+4.0
Perceived Social Feedback	31.1 Low	39.3 High	+8.2
Perceived Physiological States	28.9 Low	36.3 Average	+7.4

The mean scores for the four Comparison Group students who were able to complete both the pre- and post-Reader Self-Perception Scales are reported in Table 4.4 (below).

Table 4.4 Reader Self-Perception Scale Mean Scores
Comparison Group Students Who Completed Pre- and Post-RSPS

RSPS Category	Comparison Group Pre-test mean score	Comparison Group Post-test mean score	Net difference
General Perception	3.25	4.0	+.75
Perceived Progress	35.5 Low	35.75 Low	+.25
Perceived Observational Comparison	19.0 Low	19.0 Low	0
Perceived Social Feedback	29.0 Low	28.75 Low	+.25
Perceived Physiological States	28.5 Low	27.5 Low	-1.0

The Reader Self-Perception Scale has one item that is used to determine students' overall perception of themselves as readers. **Overall Perception** scores can range from 1 (very low) to 5 (high). Mean scores of the Intervention Group participants on pre-tests averaged 3.7. Post Overall Perception of the Intervention Group participants averaged 4.7 for a net gain in overall perception of 1.0 for those students who participated in the intervention. For comparison students, pre-test scores on Overall Perception averaged 3.25 and Post-test scores on Overall Perception averaged 4.0 for a net gain of .75. This indicates that students in the Intervention Group made greater gains in Overall Perception, according to the data collected for this study, than did

those students in the Comparison Group who took the RSPS and did not receive the intervention.

The second category on the RSPS is **Perceived Progress**. Scores in this category can range from a low of 9 to a high of 45. For participants in the Intervention Group, pre-test scores for Perceived Progress averaged 32.9 (considered to be Low). Post-test scores for Perceived Progress averaged 41.8 (Average) for a net gain of 8.9 points. The Comparison Group scored higher on pre-tests for Perceived Progress with an average score of 35.5 (Low). Post-tests scores on Perceived Progress for the Comparison Group were averaged at 35.75 (Low) for a net gain of .25. This indicates that, on average, students in the Intervention Group made greater gains in Perceived progress than did students in the Comparison Group according to the data collected for this study.

The third category on the RSPS is **Observational Comparison** or how students perceive themselves compared to other students. Scores in this category can range from 6 (Very Low) to 30 (High). Students in the Intervention Group scored an average of 18.3 (Low) on pre-tests and an average of 22.3 (Average) on post-RSPS tests for a net gain of 4 points. Students in the Comparison Group scored higher on pre-tests than those in the Intervention Group with an average score on pre-tests of 19 (Low) for Observational Comparison. Post-test scores also averaged 19 for 0 net gain. This indicates that students who participated in the intervention made greater progress than students who did not receive the intervention in terms of how they observed

themselves compared to other students according to the RSPS scores collected for this study.

The fourth category on the RSPS is **Social Feedback** or how students perceive the feedback that they get from peers, teachers and family members about their reading skills. Scores in this category may range from a low of 9 to a high of 45. In this category of reader self-perception, students in the Intervention Group averaged 31.1 (Low) on pre-tests and averaged 39.3 (High) on post-tests for a net gain of 8.2 points. Students in the Comparison Group averaged 29 (Low) on pre-tests and averaged 28.75 on post-tests for a net loss of .25 points. This indicates that students who received the intervention perceived social feedback about their reading more positively following the intervention. Increases in perceived social feedback were much greater for the Intervention Group students than for the Comparison Group students who took both pre- and post-RSPS tests.

The Final category on the Reader Self-Perception Scale is termed **Physiological States**. This is based upon student answers to questions about how they feel when reading (for example, whether they agree with statements such as, "I feel comfortable when I read", "Reading makes me feel happy inside" and other similar test questions). Scores in this category may range from a low of 8 to a high of 40. Average scores on pre-tests taken by students in the Intervention Group were 28.9 (Low). Average scores on post-tests for students in the Intervention Group were 36.3 (Average) for a net gain of 7.4 points. For students in the Comparison Group, pre-test scores averaged

28.5 (Low) and post-test scores averaged 27.5 for the category Physiological States for a net loss of 1.0. This indicates that, according to their responses to coded questions on the RSPS regarding perceived physiological states while reading, students who received the intervention perceived reading as more relaxing following the intervention. Students who did not receive the intervention (and took pre- and post-RSPS tests) perceived their physiological states while reading to be less relaxing or comfortable, according to their responses to coded questions on the RSPS regarding their physiological states while reading.

Overall, students in the intervention group made gains in how they perceived themselves as readers in every category on the tests. Students in the comparison group also made gains in how they perceived themselves overall as readers and in how they perceived their reading progress. But students who received the intervention made greater gains in how they perceived themselves overall as readers and how they perceived their reading progress. Students who received the intervention also made gains in how they perceived themselves compared to other students, in how they perceived social feedback about their reading and how they perceived reading in terms of physiological states while reading. Students who did not receive the intervention did not, according to their responses on the RSPS, make measurable gains in how they perceived themselves as readers compared to other students, how they perceived social feedback about their reading and how they perceived reading in terms of their physiological states while reading.

RSPS Matched Student Scores

In addition to analyzing average pre- and post-intervention scores on the Reader Self-Perception Scale for the Intervention Group students and the Comparison Group students, the RSPS scores for "matched pairs" of students were compared.

The first matched pair included two fourth grade students. Both students have identified learning disabilities in the area of Visual Processing and also Auditory Processing. Their pre-intervention reading levels were nearly identical. The student who participated in the intervention, however, made great gains in reading skills over the course of the intervention and post-RSPS scores indicate great improvement in how this student perceived herself as a reader. (See Table 4.5, below.)

Table 4.5 Reader Self-Perception Scale Pre- and Post-Intervention Scores

Matched Pair #1

RSPS Category	Matched Pair #1 Intervention (4th grade) Visual & Auditory SLD			Matched Pair #1 Comparison (4th grade) Visual & Auditory SLD		
	Pre-test	Post-test	Net diff.	Pre-test	Post-test	Net diff.
General Perception	4	5	+1	4	5	+1
Perceived Progress	38	44	+6	42	40	-2
Perceived Observational Comparison	17	23	+6	22	21	-1
Perceived Social Feedback	21	37	+16	39	36	-3
Perceived Physiological States	23	35	+12	32	33	+1

In the second matched pair, both students were English learners who were reclassified as fluent English proficient (RFEP) prior to participation in the study. Both were in the 4th grade when they took the Reader Self-Perception Scale and both have identified learning disabilities in Auditory Processing that have been determined to be the primary cause of their challenges with acquiring grade-level literacy skills. Although this pair of students is well-matched in terms of age, gender and identified learning disability, the student in the Comparison Group had much higher pre-BRI scores and was much closer to meeting grade-level benchmarks in reading than was the student who participated in the intervention. This may have affected the Perceived Progress and Perceived Observational Comparison scores reported for these students on their pre-tests. (See Table 4.6).

**Table 4.6 Reader Self-Perception Scale Pre- and Post-Intervention Scores
Matched Pair #2**

RSPS Category	Matched Pair #2 Intervention (4th grade) Auditory SLD (RFEP)			Matched Pair #2 Comparison (4th grade) Auditory SLD (RFEP)		
	Pre-test	Post-test	Net diff.	Pre-test	Post-test	Net diff.
General Perception	3	4	+1	3	4	+1
Perceived Progress	19	32	+13	27	28	+1
Perceived Observational Comparison	13	12	-1	20	21	+1
Perceived Social Feedback	35	37	+2	34	34	0
Perceived Physiological States	31	33	+2	32	32	0

The third pair of students was matched by identified learning disability, gender and grade-level. Both were in 5th grade when they took the Reader Self-Perception Scale. Both of these students had been retained in an earlier grade. The retention had (according to observations of general education teachers, RSP teachers and the school psychologist) contributed to a lack of self-confidence for both of these students. This apparent lack of self-confidence is evident in pre-intervention scores for both students although the Comparison Group student responded with lower pre-test scores as well as lower post-test scores (see Table 4.7, below)

Table 4.7 Reader Self-Perception Scale Pre- and Post-Intervention Scores
Matched Pair #3

RSPS Category	Matched Pair #3 Intervention (5th grade) Visual & Auditory SLD			Matched Pair #3 Comparison (5th grade) Visual & Auditory SLD		
	Pre-test	Post-test	Net diff.	Pre-test	Post-test	Net diff.
General Perception	4	4	0	2	2	0
Perceived Progress	33	44	+11	27	30	+3
Perceived Observational Comparison	20	21	+1	11	11	0
Perceived Social Feedback	36	38	+2	14	15	+1
Perceived Physiological States	31	36	+5	13	11	- 2

The developers of the Reader Self-Perception Scale caution against its use for children who are below grade 4. For one of the "matched pairs" of students who took both pre- and post-Reader Self-Perception Scales, the students were both in the 3rd

grade. Therefore the RSPS results for this "matched pair" are not presented here. For all of the matched pairs presented here, both the student in the Intervention Group and the student in the Comparison Group were in the 4th or 5th grade when they took the Reader Self-Perception Scale.

Comparing Pre- and Post-RSPS scores for matched Intervention Group and Comparison Group Students, the students who participated in the intervention made greater net gains in Perceived Progress, Observational Comparison, Perceived Social Feedback and Perceived Physiological States. There was no difference in net gains in Overall Perception scores between students in the matched pairs of Intervention and Comparison Group students with similar identified learning disabilities who were in grades 4 and 5 when they took the Reader Self-Perception Scale assessments.

Anxiety Scale Results

Each student's anxiety scale responses were tabulated for pre- and post-reading anxiety scale scores. Then pre-reading and post-reading responses were tabulated for each question for all of the students. Total pre-reading scores for each question were averaged to generate a mean pre-reading score for the group. Total post-reading scores were also averaged for each question to generate mean post-reading scores for the Intervention Group students. Mean pre-reading scores were compared to mean post-reading scores for each question. There is not a great deal of difference between the mean pre- and post-reading scores on the anxiety scales because after reading with the therapy dog a few times, students tended to circle the happy face before

reading, anticipating what they generally characterized as a "happy" or "fun" experience (see analysis of student reading journals in the next section). Nearly all of the post-reading anxiety scale scores were a 1 (happy face).

For the Intervention Group students as a whole, reading with the therapy dog reduced anxiety as measured by the anxiety scales. According to student responses to questions on the anxiety scales, students felt more stressful in general prior to reading with the therapy dog. Student responses on the Anxiety Scale indicated that they perceived reading and reading out loud as more stressful before the intervention sessions than they did after the intervention sessions. For some students, pre-reading responses indicated sad faces on all three questions prior to engaging in a reading session with the therapy dog. The only post-intervention anxiety scales that had sad faces were done by one student who expressed sadness over having to leave the therapy dog. The mean pre-reading responses and the mean post-reading responses on the Anxiety Scales are presented in Table 4.8 (below).

**Table 4.8 Anxiety Scale Pre- and Post-Reading Averages
For Intervention Group Students**

Questions on Anxiety Scale	Pre-Reading Mean Score	Post-Reading Mean Score
Q #1 How are you feeling right now?	16.6 average score	11.7 average score 4.9 decrease
Q#2 How do you feel about reading right now?	16.1 average score	12.0 average score 4.1 decrease
Q#3 How do you feel about reading out loud right now?	16.2 average score	11.7 average score 4.5 decrease

Comparing post-reading with pre-reading scores, there was a decrease in general anxiety (i.e., "how are you feeling right now?) of 4.9 points. There was a decrease in reading anxiety in general (i.e., "how do you feel about reading right now?) of 4.1 points. There was a decrease in anxiety about reading out loud of 4.5 points. Nearly all post-reading responses on the anxiety scale for all Intervention Group students were a 1 (happy face) for all three questions on the scale. Out of 270 possible post-reading responses on the Anxiety Scale (3 questions pre- and post- per session for 10 sessions so 30 post-reading responses for each of the nine students in the Intervention Group), 231 of the 270 post-reading Anxiety Scale responses were a 1. Therefore, 85% of the total post-reading Anxiety Scale responses indicated nothing other than smiling after students engaged in guided oral reading in the presence of the therapy dog.

One may argue that the data collected through the anxiety scales does not clearly indicate that students had no anxiety after reading with the therapy dog. It could be argued that circling the happy face does not necessarily indicate a decrease in anxiety and that circling a face other than the smiling face does not necessarily indicate that anxiety was present. However, the Anxiety Scale faces were based upon dental scales designed to determine children's anxiety in dental offices (Howard & Freeman, 2007) and the questions were based upon questions that have been used to indicate anxiety about reading (Zbornik, 2001). According to those scales, the students' responses indicated that there was a reduction in anxiety after students participated in the intervention.

In addition to analyzing the differences between pre-reading and post-reading responses on the Anxiety Scale in terms of average scores, individual students' scores were averaged and pre-reading scores were compared to post-reading scores. For all nine of the students who participated in the intervention, post-reading anxiety scale averages were lower than pre-reading anxiety scale averages.

Although most students circled the happiest face after reading with the therapy dog, one student circled the sad face after reading for two of her reading sessions, noting in her reading journal that she was sad to leave the therapy dog. This student, however, characterized each reading session as being very positive. She wrote, beneath one sad face, "I had a lot of fun with Kela but now I have to go." Beneath the other one she wrote, "I'm sad because I have to go. I love reading with Kela!" Therefore, the sad faces post-reading for this student were not indicative of an increased anxiety about reading (although the 5s were averaged into her responses nonetheless and in spite of circling the 5 on the anxiety scale after 2 of her reading sessions, she still showed a decrease in average scores from pre- and post-reading responses on the anxiety scales).

Many students noted, as they circled the number 1 beneath the smiling face on the anxiety scale, that they not only felt happier about reading and about reading out loud, but also had an overall feeling of happiness after reading in the presence of the therapy dog. These feelings were often expressed on paper (or were dictated to be

written down) in students' reading journals (see Reading Journals, in the following section).

Additional Evidence for Intervention Effects

In addition to the Reader Self-Perception Scale and the Anxiety Scales, data were collected through (a) reading journals, (b) student interviews and (c) parent questionnaires to evaluate the intervention's effects on student self-confidence, anxiety about reading and also to evaluate the intervention's effects on students' motivation to engage in reading activities.

Data were collected through these various instruments to answer the research questions regarding whether reading in the presence of a certified therapy dog would increase student motivation to read, increase self-efficacy and confidence in reading and decrease students' anxiety about reading, particularly about reading out loud. Some of the responses could be quantified in terms of the number of students or parents who responded in a similar manner. Such information, gathered through all three instruments, was analyzed to compare pre-intervention responses with post-intervention responses. In addition, data were coded for the expected themes of motivation, self-confidence, self-efficacy and anxiety as well as for emergent themes.

Reading Journals

Reading journals were simple composition books with the anxiety scales pasted on every other page for 2nd and 3rd grade students and on every 3rd page for 4th and 5th

grade students who might need more space in which to record their post-intervention thoughts and feelings. Every Intervention Group student had a reading journal that was used to document each of the 10 reading sessions that were experienced by the student. Therefore, there were 90 journal entries that were analyzed for additional evidence they could provide for the effectiveness of the intervention.

Prior to reading, students filled out the anxiety scales and either the students or the researcher noted the date and the title of the story that was to be read in the presence of the therapy dog. If students had reading work to do for their general education classes, then they were provided guided oral reading in the presence of the therapy dog as they read chapters from their core grade-level texts (Social Studies, Science or Literature). If students did not have reading that needed to be done for their general education classes, then students were able to choose what they wanted to read during an intervention reading session. A variety of books were available to choose from. The levels available ranged from Pre-Primer to 4th grade level literature books. Included in the books that were available were "I Can Read" books such as "Danny and The Dinosaur", "Little Bear" stories and several "Frog and Toad" books. Also included were a selection of "Henry and Mudge" stories, "Stories Julian Tells", "Because of Winn-Dixie" and three different literature texts for each grade level, first through fifth grades.

When given the opportunity to choose what they read to the therapy dog, students often chose books or stories that they thought the dog would enjoy. For example,

many second and third grade students chose to read "Frog and Toad" stories by Arnold Lobel because they are funny stories and when the students laughed at what Frog and Toad were doing, the therapy dog reacted by looking at the students, perking up her ears or seeming to "smile". Students sometimes chose to read stories about dogs when reading in the presence of the therapy dog. Many students commented that they thought the therapy dog would enjoy these stories "because there's a dog in them". One fourth-grade girl, during Phase III of the intervention, chose to read the book "Because of Winn-Dixie" because one day a week she could read a chapter from this book out loud to Kela during her intervention reading sessions. (In the book, Winn-Dixie is a stray dog and as she read, this student would comment on Winn-Dixie's actions to the therapy dog.) Some students wrote comments in their reading journals about the therapy dog enjoying stories with dogs in them, such as when one student wrote, "It was fun reading to Kela. She thought the bone story was good and tasty!"

At the beginning of intervention sessions, students tended to choose books that were on their independent reading level (as measured by grade-level scores on BRI and GORT and by teacher appraisal). As they grew in apparent confidence, students began to choose books that were more challenging. For example, one second-grade student was reading on a Pre-Primer level when he began the intervention in Phase I. He read a story from "Father Bear Comes Home" for each of his first four sessions and he read "The Wishing Well" from a first grade reader on his fifth session. By that time he had gained in both skills and confidence and so I encouraged him to try to

read a "Frog and Toad" story (early second grade level) for his sixth intervention session. With scaffolding and support, he was able to read it. In his journal he noted, "It was a little bit hard but fun. It was the first time I read "Frog and Toad" and I did it!" Another student was in third grade during Phase II of the intervention. This student read four different "Bella and Rosie" stories for the first four reading sessions. These are about two dogs, named "Bella" and "Rosie" and are on a beginning first grade level. Again, this student began to gain in apparent confidence as well as reading skills because on the fifth session, he asked to read a story from the third grade literature book. This student needed guidance and support for reading the more difficult story, but he wrote in his journal, "It is pretty hard to read a third grade story but it was easier with Kela! It was fun because Kela was sleeping, like it was a bedtime story." (See Appendix B for a sample reading journal entry.)

The journal entries were pre-coded for salient or commonly used words that seemed to capture the essence of how students experienced the reading sessions. These words and phrases were organized into categories. The initial categories contained words that were literally similar. For example, under "fun" were phrases that used the word "fun" or "funny". In the journal entries, students overwhelmingly described the experience of reading with the therapy dog as "fun". Every participant described the experience as "fun" at least one time and one participant used the word 14 times in journal entries. The next most commonly-used word in journals was "loved". Five of the participants used this word often, in statements such as, "loved reading to Kela." Less common than "loved" but also used frequently was "liked"

such as "liked reading to Kela." "Happy" was the next most commonly used word in journal entries, used 11 times in journals. Nearly half of the students described the experience as "good" (such as "I had a good time reading to Kela"). Some students described the experience as "great", "awesome", "cool", "exciting" and even "amazing". Therefore, the first theme that emerged on the initial coding of the reading journals was that reading in the presence of the therapy dog made reading **more enjoyable**. It made reading more fun and exciting and made students happy. Analyzing this, a broader theme emerged: **reading was perceived as a positive experience**. This feeling of reading as a positive experience seemed to go beyond the reading sessions in the presence of the therapy dog. "She makes me like reading better" were the words of one student in a journal entry.

The theme of **motivation** was clearly present in the data. Perhaps because students perceived reading with the therapy dog as fun, exciting, great, awesome, cool and good and because it made them feel happy, students noted that they wanted to read more. Some students stated this explicitly such as the comment, "She listens to me and so I want to read." But data collected through reading journals indicated that motivation to read went beyond being motivated to read to the therapy dog. Some students noted in their journals that reading with Kela made them want to read more at home, including reading to pets (see Table 4.9, below).

**Table 4.9 Evidence for Increased Motivation to Read
From Reading Journals**

Student #1	"It makes me want to read!" and "She makes me want to read more!" "Last night I read to my dog!"
Student #4	"It made me think to read every day. And I am!" "I'm reading more because if I read to the dog I think I can read better so I read more!" "I think Kela made me read more. I pretend (at home) that I'm reading to Kela. I read to my kitty!"
Student #9	"Kela listens to me read so I want to read. I practice and practice....!"

A theme of perceived **improved reading** also was evident in journal entries. Ten of the journal entries noted that the therapy dog contributed to this, such as the comments, "She helps me read!" and "I'm a better reader when I'm with her!" One student explained in the journal that "I loved the story and I love reading with Kela because for some reason, it makes me concentrate!" For this student, improved concentration led to improved reading since this student has an identified learning disability that impacts her attention and focus. She explained that with greater concentration she "knew more words so I know more that was in the book."

Some reading journal entries, like those noted above, stated that students perceived that they read better while reading with the therapy dog. Other comments expressed improved reading over-all. For some students, these comments on improved reading expressed greater **confidence and self-efficacy** in the students' reading skills.

Comments that may be evidence for increased self-efficacy or increased self-confidence are presented in Table 4.10 (below).

Table 4.10 Evidence for Increased Self-Efficacy and Confidence in Reading From Reading Journals

Student #1	<p>"It was a little bit hard, but fun! It was the first time I read Frog and Toad and I did it!"</p> <p>"I think it (reading with Kela) will make me a better reader because I don't read much and she makes me want to read more" (also under "motivation")</p>
Student #3	"I am a bookworm now!" (also an expression of motivation to read)
Student #4	<p>"If I read to Kela and you, I know more words like 'through' or 'thought'!"</p> <p>"If I read to the dog I think I can read better..."</p> <p>"I love to read to Kela! My reading got so much better!"</p> <p>"I love to read now! I readed a book in 2 days!"</p>
Student #5	<p>"My reading got so much better!"</p> <p>"I'm a better reader when I'm with her!"</p>
Student #8	"It is pretty hard to read a 3rd grade story but it was easier with Kela!"
Student #9	"Kela listens to me read so I want to read. I practice and practice so I've gotten better at reading!"

These comments expressed self-efficacy and confidence in several ways. Some students mentioned that they were able to read books that had previously been challenging for them (such as Student #1 and Student #8, below). Other students mentioned that they believed that they had become better readers due to reading more

(Student #1 and Student #9). Confidence was also expressed by students who noted in their journals that they were able to read more quickly, such as Student #4 who note that she "readed a book in 2 days!" The student who commented in her reading journal, "I'm a bookworm now!" was a student who had, prior to the intervention, been struggling with reading and had been reluctant to read both at school and at home. Her comment about being a "bookworm" was an expression of confidence as well as an expression of motivation to read.

Data collected from the reading journals also provided evidence for a reduction of anxiety about reading when the therapy dog was incorporated into guided oral reading sessions. There were no explicit references to anxiety, but there was evidence that students felt **greater comfort** when reading with the therapy dog present. In student journals, the words "comfortable", "relaxed" and "feel good" were used 12 times. Several students mentioned the dog's soft fur. "Fluffy" and "cuddly" were used to describe the dog during reading sessions while "snuggled" was used to describe the dog's actions.

One student had been very reluctant to read out loud before he began to participate in the intervention. He circled neutral or frowning faces prior to reading for his first few sessions. But he described the experience as "fun" in his journal for every session and wrote, "I love reading to Kela!" in three journal entries. He wrote, "It felt good to read to Kela" in one journal entry and wrote, "I had fun. She snuggled" in another entry. By the fourth session, he began to circle the smiling (but not broadly

smiling) faces before reading and then circled the broadly smiling faces after reading. For his ninth session, he circled the broadly smiling faces prior to reading as well as after reading. He had chosen "The Tale of Peter Rabbit" to read during that session and was excited to read it to Kela. Afterwards, he wrote in his reading journal, "It was good. Kela like the rabbits." After receiving 10 intervention sessions, this student wrote, "I like reading with Kela for three reasons. First, Kela is soft when I pet her. Next, she is funny when I say the word 'cookie' her ears go up. Last, she waves goodbye to me...Reading to Kela is fun!"

Another student was also clearly comforted by the therapy dog. Prior to one of his first intervention sessions, before he knew he would be reading with the therapy dog present, he circled all of the sad-looking faces on the Anxiety Scale in his reading journal. When asked about this, the student answered, "I feel scared". When asked why, he replied, "Sometimes I don't know a word". After his intervention reading session, he circled smiling faces. He wrote, "It was fun!" In another reading journal entry, this student noted, "Fun! And cool! I got to give Kela her treat! And I feel better about reading!"

Table 4.11 (below) includes comments made in student reading journals that provide additional evidence that the intervention contributed to a decrease in anxiety (or at least a decrease in feelings of discomfort) for students who participated in guided oral reading sessions with the therapy dog present. Some of the comments

were explanations of student responses to the Anxiety Scales in their reading journals.

For these comments, the fact that they are references to the Anxiety Scales is noted.

**Table 4.11 Evidence for Intervention's Effects on Student's Feelings of Anxiety
From Reading Journals**

Student #1	<p>This student had expressed feeling "scared" to read out loud prior to participating in the intervention because he might not know a word. After reading, he wrote:</p> <p>"It was easy (to read)! (I feel) Happy! She is fluffy!"</p> <p>In another journal entry this student wrote: "Fun! And cool! I got to give Kela her treat. And I feel better about reading!"</p>
Student #2	"I was excited before I read, when I saw Kela!" (explaining why she circled smiling faces on the Anxiety Scale before and after reading)
Student #3	<p>"I feel a lot more comfortable about reading when I read with Kela".</p> <p>"I feel more relaxed reading with the dog".</p>
Student #4	"I'm not afraid to read when I read with Kela!"
Student #7	"furry and comfortable reading with Kela"
Student #8	"I had fun. She snuggled!"
Student #9	<p>"Since she's all soft, it makes me read better because I feel comfy and when I feel comfy I'm able to read better!"</p> <p>Explaining sad faces on Anxiety Scale before reading and happy faces after reading with Kela:</p> <p>"I was sad before (reading with Kela) but now I'm happy! Being around her makes me feel loved!"</p>

Almost half of the Intervention Group students expressed that they felt "loved" when reading in the presence of the therapy dog. For one student in particular, this

was a theme that was repeated often in her journal entries. This seemed to be a part of a broader theme about feeling **trust in the listener** when students were participating in guided oral reading. This was an emergent theme that came from the coding of the data. The fact that the dog was perceived to be actively listening to the students as they read was mentioned 14 times in the journal entries. All participants mentioned this either directly or indirectly such as by making comments about the dog's reactions to what was read (i.e., "she put her head down when she heard the word 'raccoon' and perked her ears up when she heard the word 'cookie!'"). Some of the comments that students wrote in their reading journals regarding the fact that the therapy dog was listening to them read are presented in Table 4.12 (below).

**Table 4.12 Therapy Dog Listens
From Reading Journals**

Student #1	"She helps me because it helps me read when somebody's listening."
Student #2	"I think she really cared about it" (the story) "I felt like Kela wanted to read to (with) me"
Student #4	"It's fun because Kela listens to you"
Student #6	"(reading was) fun because the dog listened".
Student #9	"Kela listens to me read so I want to read." "She makes me feel loved. When I read with Kela I read better because I feel loved."

This emergent theme about the therapy dog listening to students read does not explicitly state that the dog was uncritical as she listened to the students read. However, the theme of the dog listening was also evident in data that was collected through post-intervention interviews and in this data, the fact that the dog was not critical as she listened was stated explicitly by some students (refer to Table 4.9 in the next section).

Pre- and Post-Interviews

Interviews were conducted for all Intervention Group students prior to and again after students participated in the reading intervention so there were nine pre-intervention interviews and nine post-intervention interviews for a total of 18 interviews that provided data for this study. Pre- and Post-interview responses were identical except for the added questions on the Post-interview that were specifically inquiring about how students experienced the intervention (See Appendix C). Interviews were held in the RSP room without the therapy dog being present. They were held 1:1 usually without anyone else in the room (the RSP aide was in the room, working independently, for some of the interviews). Most of the interviews took place during the researcher-teacher's lunch break. Two interviews took place before school and three interviews took place immediately after school.

Since time for conducting interviews was limited, the protocol was followed closely and brief responses were acceptable. Typically, students responded to questions with one sentence and sometimes with just one word. At times, however,

students volunteered more information than was asked and when this occurred, all that the students volunteered was noted on the interview protocol. The only other deviation from following the protocol explicitly was if students' answers were not clear. In this case, the researcher-teacher asked clarifying questions ("can you tell me more about that?" or "Can you explain that?") and both the clarifying questions and the student responses were noted on the protocol.

When analyzing the student interviews, the interviews were typed for each student so that pre-intervention responses (typed in blue) could be easily compared with post-intervention responses (typed in red). This provided clarity for comparing similarities and differences between the pre- and post-intervention responses for individual students. Following this, all of the pre- and post-interview responses for each interview question were copied and pasted onto one page so that the responses could be analyzed for each interview question for the Intervention Group students as a whole.

In looking at the differences between pre- and post-intervention responses, there were changes in the quality and intensity of student responses to some questions. These changes can be noted in terms of the number of students who answered interview questions about reading and reading out loud with strong affirmatives (an enthusiastic "Yes!"), simple affirmatives ("yes" or "yeah"), "sometimes" (or "not that much" or "sort of"), and clearly negative responses (which ranged from "not really" to

firm "NO!" responses). This analysis of student pre- and post-interview responses is presented in Table 4.13 (below).

Table 4.13 Pre- and Post- Interview Responses Quantified

Interview Questions	Possible Responses	PRE- Intervention	POST- Intervention
1. Are there times when you really want to read something?	Strong Affirmative Affirmative Sometimes Negative	1 yes 2 yeah 3 sometimes 3 NO!	5 YES! 4 yeah 0 0
2. Do you like to read?	Strong Affirmative Affirmative Sometimes Negative	2 yes 2 yeah 3 sometimes 2	7 yes! 2 yeah! 0 0
3. Do you like to read out loud? 4. (See narrative in following section)	Strong Affirmative Affirmative Sometimes Negative	0 2 yeah 4 sometimes 3 No!	4 Yes! To Kela! 3 yeah 1 1
5a. Do you like reading out loud ...	with the teacher?	1 yes 4 yeah 2 sometimes 2 not really	1 Yes! 4 yeah 4 depends, sometimes
5b. Do you like reading out loud ...	with someone else?	0 yes 2 yeah 2 sometimes 5 no	4 Yes! 5 yeah 0 0
5c. Do you like reading out loud ...	with a toy or something else?	0 yes 2 sometimes 7 no	5 Yes! To Kela! 1 yes, to my dog 2 yes to stuffed animal 1 sometimes 0 no
6. How often do you read out loud?	Daily 3-4x/week 1-2 x/week "not that much" don't know	2 1 1 3 2	7 2 "almost every day" 0 0 0

Looking at the tabulated responses to the interview questions, it is clear that, following participation in the interview, there was an increase in students' affirmative responses regarding whether there are times when students want to read. There was also an increase in students' affirmative responses regarding whether they liked to read and whether they like to read out loud. There was a slight increase in whether students enjoyed reading out loud to the teacher but larger increases in positive responses to the questions that asked whether the student enjoyed reading out loud "with somebody else" or "with a toy or something else". Many of the students responded with "Yes! To Kela!" and several went on to add details about this.

Question #4 ("Is it harder for you to read out loud than silently?") is not included in Table 4.13 (above) because the question was phrased in such a way that a "yes" response indicated challenges with reading out loud while other questions asked in the interview were phrased in such a way that a "yes" response indicated positive feelings about reading. Five of the students who participated in the study replied "No" to question #4. All of the students who participated in the study had been participating in guided oral reading with the researcher-teacher prior to the implementation of the study. For the five students who responded "No" to question #4 on the pre-intervention interview, three of them mentioned that it was easier to read out loud because they could receive help for their reading. All five of these students also replied "No" to Question #4 on their post-intervention interviews.

Four students answered "Yes" to Question #4 on the pre-intervention interview, indicating that it was harder for them to read out loud than to read silently. For one of those students, the answer in the pre-intervention interview was, "Yes. I don't like reading out loud because I mess up more." This student's post-intervention response was a firm "No!" followed by, "It's easier!" (to read out loud). Another student who answered "Yes" to Question #4 on the pre-intervention interview noted that reading out loud was harder because "I might mess up on a word..." but on the post-intervention interview, this student answered "No" and added, "If you mess up you get embarrassed, but it's not embarrassing to mess up with Kela." The third student who answered "Yes" to Question #4 on the pre-intervention interview answered "No, it's easier with you and Kela!" on the post-intervention interview. The fourth student who answered affirmatively to Question #4 on the pre-intervention interview responded with, "Yes, cuz I get nervous and make mistakes...then I get sad." This student's post-intervention response to Question #4 was, "Not when I read to Kela!"

Themes similar to those that were interpreted from journal entries were found in the pre- and post-intervention interviews. As with the journal entries, students' responses to the interview questions indicated that the intervention had **improved students' perception of reading as an enjoyable activity**. In the Pre-intervention interviews, when asked if they liked to read, (question #2), two students responded with "yes", 2 responded with "yeah", three students responded with "sometimes", and two students responded negatively ("not really" and "just a little"). In post-intervention interviews, all nine of the students responded with an affirmative, seven

of them strongly affirmative responses. Affirmative responses were followed by "It's fun!" for three students and by "I love to read!" for two students. For some students, there was a dramatic change, post-intervention, in their apparent perception of reading as an enjoyable activity. One student noted, in the pre-interview Question #2 (Do you like reading?), that she liked reading "just a little because there are lots of other things I could do," and in the post-interview, replied "Yes! Because it makes me happy!" Another student's pre-intervention response to this question was "sometimes...me and my friend are really slow readers so we don't get the chapter books" while this student's post-intervention response was, "Yes! I love to read!"

Some students said explicitly that the intervention changed how they felt about reading. Some of the phrases that were coded under the category of "**changes in feelings about reading**" were: "She helped me change by being really fun so now I like reading more" and "It made me feel better about reading. It was fun reading to a pet". One student tied this in to his perceived improvement when he said, "I'm starting to read faster every day (reading with Kela). It made me like reading more!"

One of the themes that emerged from coding the interviews was that of **improved motivation** to read. Question #1 of the interview is "Are there times that you really want to read something?" Of the nine pre-intervention responses, one was "yes", one student answered "yeah", one answered "yeah, kind of", one answered "yeah, sometimes", two students responded with "sometimes", one answered "not really" and two answered "No!" All nine of the post-intervention responses were "Yes!"

including the responses of those who had responded with a firm "NO!" in the pre-interview. Increased motivation to read was also evident in post-interview questions that were asked explicitly about how students perceived the intervention. Increased motivation to read was evidenced by statements given by students in post-interviews.

**Table 4.14 Evidence for Increased Motivation to Read
From Student Interviews**

Pre-Intervention Interview	Post-Intervention Interview
<p>Student #1</p> <p>Q#6 How often do you read out loud?</p> <p>"Not that often"</p>	<p>Student #1</p> <p>Q#6 How often do you read out loud?</p> <p>"Every night by myself! Even when she (mom) says I can't, I still do it!"</p> <p>"Now I read...every single day and mornings"</p>
<p>Student #3 Pre-Intervention Response</p> <p>Q#6: How often do you read out loud?</p> <p>"Sometimes I'm lazy. I don't feel like reading the words."</p>	<p>Student #3 Post-Intervention Response</p> <p>Q#6 How often do you read out loud?</p> <p>"I read by myself now! I have a loft so sometimes I go up there with a book and start reading. I actually just finished a book by Roald Dahl and now I'm reading another one!"</p>
<p>Student #4</p> <p>Q#6 How often do you read out loud?</p> <p>"Not that much..."</p>	<p>Student #4</p> <p>Q#6 How often do you read out loud?</p> <p>"A lot, because I'm here a lot and sometimes I read out loud when I'm in my room alone or in the car."</p> <p>"I feel like I'm in a different world (when I'm reading with Kela). I'm happy! She makes me want to read all the time!"</p> <p>"When I was on a low, low level, I never wanted to read. But now I want to read all the time!"</p> <p>"Once I read a book... to Kela, I read the book again and pretend Kela's there!"</p>

Student #7 Pre-Intervention	Student #7 Post-Intervention Interview "I used to not really read at all then I started reading more often"
Student #8 Pre-Intervention Q#2 Do you like to read? "umm...sort of"	Student #8 Post-Intervention Q#2 Do you like to read? "Yes! It's Fun!"
Student #9 Pre-Intervention Q#1 Are there times when you really want to read? "NO! What makes you want to read? "Nothing!"	Student #9 Post-Intervention Q #1 What makes you want to read? ""When I'm bored, when it's time to go to bed, when I'm at my grandma's house, when I'm with you! And Kela!" "I feel loved (with Kela) so I read more and I feel happy about reading." "I love it! (reading with Kela) It's my favorite thing to do in school!"

Improved reading is also an evident theme in student responses to the interview questions. Many students noted improved reading as they responded to the first 5 questions on the post-intervention interview. When asked explicitly about this during the post-interview, students provided examples of how their reading improved through the intervention. Reading "faster" and "easier" or "smoother" was noted by over half of the participants. Others mentioned being able to read "bigger words". Some of the comments that the participants made about improved reading skills in their post-intervention interviews were indications of increased self-efficacy or an increase in confidence about reading. Comments about improved reading that could indicate **increased** self-efficacy and **confidence** are presented in Table 4.15, below.

**Table 4.15 Evidence For Improved Reading, Self-Efficacy & Confidence
From Student Interviews**

Pre-Intervention Interviews	Post-Intervention Interviews
Student #1	"She made me read more and more and I got better and better!" "I read a lot with Kela and when I read a lot, the more you read the better you get!"
Student #2	"She makes me feel proud of myself. Because I'm getting better at reading"
Student #3 Pre Interview "Sometimes I'm lazy. I don't feel like reading the words"	Student #3 Post Interview "I think I'm fine! My mom doesn't have to ask me to read!" "I definitely could read faster and smoother than I usually do" (when reading with Kela present)
Student #4 Pre Interview "Me and my friend are really slow readers so we don't get the chapter books..."	Student #4 Post Interview "I was reading on a low level and now I read on a high level. I'm reading 'Little House on The Prairie' and that's not an easy book!"
Student #7 Pre Interview "I don't like reading out loud cuz I might mess up on a word. But if the book's really easy, it's fine."	Student #7 Post Interview "I like reading out loud cuz when I read silently I don't correct my mistakes but when I read out loud I do (correct mistakes)." "If you mess up you get embarrassed, but it's not embarrassing to mess up with Kela" "I probably got my reading out loud skills better."
Student #8 Pre Interview Q#2 Do you like to read? "umm...sort of"	Student #8 Post Interview Q#2 Do you like to read? "Yes! It's Fun!" "I'm starting to read faster every day! It made me like reading more!"
Student #9	"I've improved! By practicing with Kela!"

Coding of the interviews provided evidence that there was an increase in comfort in reading, including evidence for a **decrease in anxiety** about it, especially **about reading out loud**. In the pre-intervention interviews, answers to Question #3 (Do you like to read out loud?) no students gave strong affirmatives. Two students replied "yeah", 4 students replied "sometimes" or "not really" and 2 students clearly indicated that they did not like to read out loud. In post-intervention interviews, 7 students responded that they liked to read out loud. Some of the responses mentioned the therapy dog by name (i.e., "Yes! Because it's fun to read with Kela!") Feeling more comfortable when reading with the therapy dog was noted by over one third of the participants. Sometimes students used the word "comfortable" and other times they used words that are associated with comfort such as "soft", "fluffy" and "relaxing". Words and phrases about comfort were organized under the category "Greater Comfort".

In the pre-intervention interviews, none of the responses included the words "comfort" or "comfortable". Pre-intervention interview responses did include words that indicated discomfort, such as "embarrassed" and "nervous". When students who had expressed such discomfort in pre-intervention interviews expressed greater comfort in post-intervention interviews, it provides some evidence that the intervention may have contributed to a decrease in anxiety about reading for these students, particularly anxiety about reading out loud. Interview responses that provide evidence for reduced anxiety about reading are presented in Table 4.16 (below).

**Table 4.16 Greater Comfort When Reading, Evidence for Reduced Anxiety
From Student Interviews**

Pre-Intervention Interview Responses	Post-Intervention Interview Responses
<p>Student # 4</p> <p>Q#3 Do you like to read out loud?</p> <p>"Sometimes..."</p>	<p>Student #4</p> <p>Q#3 Do you like to read out loud?</p> <p>"Yes! I LOVE to read!</p> <p>"It's more comfortable" (reading, when reading with Kela)</p> <p>"I can pet her when I'm reading and I focus and I understand the book."</p>
<p>Student #5</p> <p>Q#3 Do you like to read out loud?</p> <p>"Sometimes....um...I don't like it"</p>	<p>Student #5</p> <p>Q#3 Do you like to read out loud?</p> <p>"With Kela! Then I can practice more better."</p> <p>"Maybe with her beside me I was happy so I could read better."</p>
<p>Student #6</p> <p>Q#3 Do you like to read out loud?</p> <p>"No, because my face gets all red because I get embarrassed!"</p>	<p>Student #6</p> <p>Q#3: Do you like to read out loud?</p> <p>"I like reading to Kela because there was a fluffy thing touching me and it was really comfortable. She would sit right next to me and I would be focused in the book."</p>
<p>Student #8</p> <p>Q#3 Do you like to read out loud?</p> <p>"NO! Cuz I get nervous and make mistakes and then I get sad"</p>	<p>Student #8</p> <p>Q#3 Do you like to read out loud?</p> <p>Yes! (But only to Kela...and my little brother!)</p> <p>Q#4 Is it harder to read out loud?</p> <p>"Not when I read to Kela!"</p>
<p>Student #9</p> <p>Q#3 Do you like to read out loud?</p> <p>"No because its harder."</p>	<p>Student #9</p> <p>Q#3 Do you like to read out loud?</p> <p>"I like to read to Ms. Treat and Kela!"</p> <p>"The more people next to me, the better I read cuz I feel more comfortable."</p>

As with the Reading Journals, the idea that Kela is "listening" to students as they read was mentioned by students in the post-intervention interviews. It seems that this listening was a comfort to the students as well as something that made reading more "fun". Animism was surely playing a part in at least some students' reactions to and experience of reading in the presence of a therapy dog. Three of the intervention participants likened the therapy dog to a person. In addition to the comments about the dog "listening", students noted that they were comforted by her presence such as these interview responses: "It feels like I'm talking to a person" which was followed by, "When I'm reading by myself I feel lonely" (but reading with Kela is not lonely). Some students mentioned that when the dog listened, she didn't "talk and interrupt". Two students mentioned that she did not criticize. Among the responses that mentioned the therapy dog listening are those presented in Table 4.17 (below).

**Table 4.17 Emergent Theme: Therapy Dog Listens
From Student Interviews**

Student	Post-Intervention Interview Responses
Student #2	<p>"It's like you're reading to a person, it feels like, but you're reading to an animal who listens!"</p> <p>"It's better when I read to Kela because she listens to me a lot better"</p> <p>"When people are listening to me, they're usually doing something else"</p>
Student #6	"It feels like I'm talking to a person" (when reading to Kela)
Student #8	"She listened to me when I was reading. She would perk up her ears when we say some words like, 'cookies'. It was very fun and exciting!"
Student #9	"I was with someone who listens so I could understand better."

Parent Questionnaires

Parents were provided questionnaires pre- and post-intervention. Six parents returned both pre- and post-questionnaires so information from those questionnaires were analyzed for this study. The pre- and post- questions were the same. The post-intervention questionnaire included questions that asked specifically about how parents perceived the intervention for their child. (See Appendix D).

Table 4.18 Parent Questionnaire Pre- and Post-Intervention Responses

Questions	Pre-Intervention Responses	Post-Intervention Responses
1. How do you think your child feels about reading?	Dislikes reading = 2 likes a little bit = 2 likes reading = 2 loves reading = 0	Dislikes reading = 0 likes a little bit = 0 likes reading = 4 loves reading = 2
2. How confident do you think your child is about his/her reading skills?	Not at all confident = 3 somewhat confident = 2 confident = 1 very confident = 0	Not at all confident = 0 somewhat confident = 1 confident = 4 very confident = 1
3. Does your child ever feel motivated to read at home?	Yes = 3 occasionally = 2 No = 1	Yes = 6 occasionally = 0 No = 0
4. How often does your child read at home?	Never = 0 once a week or less = 2 twice a week or more = 4 daily = 0	Never = 0 once a week or less = 0 twice a week or more = 3 daily = 3
5. How often does your child read out loud at home?	Never = 0 once a week or less = 3 twice a week or more = 2 daily = 1	Never = 0 once a week or less = 1 twice a week or more = 3 daily = 2
6. How would you describe your child's feelings about reading out loud?	Does not like it = 2 Sometimes ok with it = 2 Likes it = 2 loves it = 0	Does not like it = 0 Sometimes ok with it = 1 Likes it = 4 loves it = 1

7. Has your child talked to you about reading out loud? If so, what has he/she said?	He doesn't really like to read" He does not feel he is as good as other students" "She does not feel like it"	"Mom! Let me read to you!" "He likes it now! He laughs!" "She likes to read out loud!"
8. Does your child read	To him/herself? yes = 3 with a sibling? yes = 2 with a toy? yes = 0 with a pet? yes = 0 with a parent/adult yes = 6	To him/herself? yes = 6 with a sibling? yes = 4 with a toy? Stuffed toy = 2 with a pet? yes = 3 with a parent/adult? yes = 6
9. How much has your child improved in reading over the past 2-3 months?	Not at all = 0 Some = 5 A great deal = 1	Not at all = 0 Some = 1 A great deal = 5
10. If your child's reading has recently improved, what do you think helps to account for that improvement?	"ready developmentally" "everyday reading" "practice" "support from school"	"sessions with Kela made him more confident" "more reading, more confidence" "the therapy dog" "She likes reading with the therapy dog!"

Parent questionnaires indicate that, after participating in the intervention, students improved in their feelings about reading, their confidence in their reading skills, their motivation to read, the frequency of reading at home and in their willingness to read out loud at home. Parents noted in the post-questionnaires that students' attitudes about reading out loud had changed and that students were reading out loud more at home. Two parents noted that their child had begun to read to stuffed animals. Three parents noted that their children were reading to pets in their home. Parents also noted greater improvement in the 2-3 months during which their child participated in the intervention than they perceived in the 2-3 months prior to the intervention. Prior to

the intervention, only one parent noted "a great deal of improvement" in reading for their child during the previous 2-3 months. Following the intervention, five of the six parents who returned post-intervention questionnaires noted "a great deal of improvement" in the previous 2-3 months.

It could be that parents who returned the questionnaires were those who witnessed the most growth. Perhaps the parents who returned the questionnaires were motivated to return them for other reasons, including rapport with the teacher-researcher. However, the results of the parent questionnaires do provide yet another source of evidence that reading in the presence of the therapy dog influences students' attitudes about reading, feelings of confidence in their reading, motivation to read and contributes to an increase in the amount of reading that is done in the home.

Summary of Intervention Effects on Motivation, Self-Confidence and Anxiety

Data collected from multiple sources were analyzed to answer research question #2, whether reading in the presence of a therapy dog might improve motivation to read; question #3, whether reading in the presence of a therapy dog might improve students' confidence and self-efficacy about reading, and question #4, whether reading in the presence of a therapy dog might decrease students' anxiety about reading, including anxiety about reading out loud. In the following section, each question will be answered separately through providing evidence gathered by analyzing the data collected from student interviews, student reading journals and from parent questionnaires. For Question #3, data from the Reader Self-Perception

Scales will also be included and for Question #4 data collected from the Anxiety Scales will be included.

(2) Does reading in the presence of a certified therapy dog increase students' motivation to read?

Data revealed that reading in the presence of a certified therapy dog did increase students' motivation to read. In students' reading journals, students often spontaneously noted that reading with the therapy dog made them want to read more. Interviews also revealed a theme of motivation to read. There was not only an increased situational motivation to read while in the presence of the therapy dog, but also an increase in what appears to be intrinsic motivation to read. Three of the students wrote that, after reading with the therapy dog, they had begun to read to their pets at home.

All of the nine Intervention Group participants noted, either in journals or in interviews, that they have begun to read more after participating in the intervention. Parent questionnaires also indicated that students who participated in the study demonstrated increased motivation to read at home after participating in the intervention. There were numerous references to increased reading frequency (including repeat-reading) in the data collected for this study.

(3) Does reading in the presence of a certified therapy dog improve student feelings of self- efficacy and confidence in their reading skills?

Data collected on the Reader Self-Perception Scale (RSPS) and data collected from reading journals, interviews and parent questionnaires were able to shed light upon this research question. The Reader Self-Perception Scale (RSPS) scores indicate that participants in the study's intervention improved in their perceptions of themselves as readers in all of the categories: Overall Perception, Perception of Progress, Perception of Observed Comparison with others, Perception of Social Feedback and Perception of their physiological states while reading (i.e., perception of feeling "internal comfort" while reading). Net gains on pre- and post-RSPS tests indicated that the comparison group also made gains in Overall Perception and in their Perception of Progress although the gains were not as great as the gains made by participants in the intervention. Comparison students who completed the RSPS did not make measurable gains in the other categories on the RSPS.

Data collected through reading journals and interviews also suggested that the intervention contributed to increased self-confidence and feelings of self-efficacy about reading for study participants. In reading journals and in interviews, students wrote and spoke about how they were getting better at reading. Students mentioned reading "faster", "smoother", being able to read "bigger words". All nine of the Intervention Group participants noted reading "better", either in their reading journals or in post-intervention interviews.

Parent questionnaires provided data that indicated that the intervention increased student's confidence in their reading skills. On pre-intervention questionnaires, three

parents rated their children as "not at all confident" in their reading, one parent rated the child as "somewhat confident" and only one parent's response was "confident". No parent circled "very confident" on pre-intervention questionnaires. On post-intervention questionnaires, one parent noted "somewhat confident" but four parents described their children as being "confident" in their reading skills and one parent responded with "very confident".

(4) Does reading in the presence of a certified therapy dog decrease students' anxiety about reading?

The Reader Self-Perception Scale showed net gains for participants in the questions that were coded to measure physiological states (specifically, "internal comfort") while reading. Average scores on RSPS pre-tests taken by students in the Intervention Group were 28.9. Average scores on post-tests for students in the Intervention Group were 36.3 for a net gain of 7.4 points for questions that are designed to measure students' comfort level while reading. For students in the Comparison Group, pre-test scores averaged 28.5 and post-test scores averaged 27.5 for the category Physiological States for a net loss of 1.0. This data indicated that students who received the intervention perceived reading as more relaxing following the intervention according to their responses to coded questions on the RSPS regarding physiological states while reading. Students who did not receive the intervention did not change in their perception of their physiological states while reading according to their responses to coded questions on the RSPS that are designed

to measure how children perceive their physiological states while reading (including statements that referred to feeling "comfortable" or "happy" when reading).

Therefore, data collected through the RSPS suggested that the intervention may have influenced students who received the intervention to have a more positive perception of their physiological states while reading after their participation in the intervention.

In addition to this, the Anxiety Scales that were filled out by students before and again after each reading session indicated a reduction in anxiety after every reading session. Reading Journals sometimes put words to the feelings depicted on the Anxiety Scale faces. Students described reading with the therapy dog as "fun" 49 times in reading journals. Students also described reading with the therapy dog as "comfortable" 12 times in reading journals.

In post-intervention interviews, students also mentioned feeling "comfortable" when reading with the therapy dog. After analyzing the data collected from multiple sources, the researcher believes that the data collected in this study suggested that reading in the presence of a therapy dog may have contributed to decreased anxiety about reading, including decreased anxiety about reading out loud for students who have identified learning disabilities that have impacted their acquisition of literacy skills.

CHAPTER 5:

CONCLUSIONS, DISCUSSION, IMPLICATIONS

In this chapter the results obtained through all of the data-collecting instruments are discussed as they reflect the underlying theoretical framework upon which the study was based. This study was designed to provide empirical evidence regarding whether incorporating a certified therapy dog into guided oral reading sessions would increase the reading performance of students with identified learning disabilities, as measured by oral reading tests. The researcher proposed that the intervention would increase students' reading skills as measured by these tests because the intervention would increase students' motivation to read, increase students' feelings of self-efficacy and confidence in their reading skills, and would reduce anxiety about reading, including anxiety about reading out loud.

Conclusions regarding the effectiveness of the intervention are based upon data collected from the Gray Oral Reading Test (GORT-4) and Basic Reading Inventory (BRI) and will be presented in the first section of this chapter. This will be followed by a discussion regarding the roles that motivation, self-efficacy and anxiety may have played in the results. Finally, there is a summary of findings, proposals for future research and a discussion of the implications of the findings of this study for educators and for educational policy.

Conclusions Regarding the Effectiveness of the Intervention

The effectiveness of the intervention was determined primarily by pre-intervention and post-intervention testing on the Gray Oral Reading Test (GORT-4). Additional evidence for the effectiveness of the intervention was provided through the quasi-experimental aspects of the design, which provided for a comparison between the Intervention Group and the Comparison Group on the Basic Reading Inventory (BRI) pre-test and post-test scores.

Gray Oral Reading Test (GORT-4) Results

The results of pre- and post-intervention testing on the GORT-4 demonstrated statistically significant gains for all Intervention Group students in reading rate, fluency, accuracy and comprehension. For nearly all of the Intervention Group students, the change from pre-test to post-test scores was dramatic. A paired samples t-test was conducted to compare mean pre-intervention with mean post-intervention GORT-4 scores and the t-tests determined there was a significant difference in the mean pre- and post-intervention scores for reading rate, accuracy, fluency, comprehension. For Rate, the t-test score was -3.6 ($p < .007$). Accuracy was -4.9 ($p < .001$), Fluency was -7.25 ($p = .000$) and the Comprehension t-test score was -5.4 ($p < .001$). These t-test scores suggest that the difference between post- and pre-test scores on the GORT-4 was highly unlikely to have occurred by chance.

A paired samples t-test was also conducted to compare mean Oral Reading Quotient pre-intervention scores ($M = 77.5$, $SD = 10.46$) with post-intervention mean

Oral Reading Quotient scores ($M = 91.66$, $SD = 9.22$) $t = -5.382$ ($p = .0001$). This is a very significant statistical difference in the scores, suggesting that the intervention contributed to the increase in Oral Reading Quotient scores. The increases in Oral Reading Quotient scores were not just statistically significant. The differences between pre- and post-test scores were significant for the individual students, indicating impressive growth in reading skills for every student who participated in the intervention. On pre-intervention GORT tests, there was only one student whose ORQ score was in the Average range. One student's pre-intervention ORQ was in the Below Average range. All six of the other Intervention Group students, prior to receiving the intervention, had ORQ scores in the "Poor" to "Very Poor" range. Yet on post-intervention GORT-4 tests, five ORQ scores were in the Average range, three were in the Below Average range, two were in the Poor range and none were in the Very Poor range.

Students who participated in the intervention made greater gains during the time that they participated in the intervention than would be expected. Mean grade-level scores for all students who participated in the intervention indicate a mean intervention time of 4.9 months. Participation in the intervention varied from a minimum of one month to a maximum of seven months. One would expect there would be a maximum of seven month's growth between pre- and post-test scores. However, the difference between post-test scores and pre-test mean scores revealed net gains of more than a year's growth in reading rate, accuracy, fluency and comprehension. Net gains in mean scores were a reflection of individual student net

gains. All students who participated in the intervention made much more accelerated growth than would be expected for the amount of time over which they participated in the intervention. Testing done by general education teachers validated these results. The gains measured by general education teachers on the BRI very closely matched the gains measured on the GORT-4. This was true for individual students as well as for the Intervention Group as a whole.

Intervention Group and Comparison Group Results

The GORT-4 results reported above indicate that the students who participated in the intervention made significant gains in their reading skills. For the quasi-experimental aspect of the study's design, the students who participated in the intervention were termed the Intervention Group. Students in the Intervention Group were "matched" with students who have similar identified learning disabilities. These students did not participate in the intervention but did participate in guided oral reading without the presence of the therapy dog. These students have been referred to as the Comparison Group.

All Intervention Group and Comparison Group students were administered the Basic Reading Inventory test (BRI) by their general education teachers. The BRI is administered every trimester by the third, fourth and fifth grade teachers at the school where the study took place. This allowed the researcher to collect data from the BRI for both groups of students. Data were collected pre- and post-intervention for the

Intervention Group students and collected at the same time for the matched students in the Comparison Group.

When drawing conclusions from the BRI data collected for this study, it is important to remember that all of the students who participated in this study were receiving special education support because they were reading below grade-level expectancies due to identified learning disabilities. For all of these students, the need to make gains in their reading skills was critical because without support and effective intervention, students who are reading below grade-level expectancies have difficulty accessing core curriculum and are at risk for falling farther and farther behind their grade-level peers in all academic subjects. Strategies that have been found to be effective in teaching literacy skills to these students include guided oral reading (Idol, 2010, Singleton, 2005, Katz & Carlisle, 2009), reading texts multiple times (Scull, 2010, Algozzine et al., 2009) and paired reading with peers (Algozzine et al., 2009). All of the students who participated in this study, Comparison Group and Intervention Group students alike, were provided with literacy instruction that included guided oral reading, multiple reading of texts and paired reading with peers.

This literacy instruction resulted in reading skills growth for all students. Both the Intervention Group students and the Comparison Group students made measured gains in their reading skills according to pre- and post-BRI tests, which were administered by their general education teachers. However, the Intervention Group students made greater gains in all reading skill areas. They gained more words per

minute in fluency. They made fewer miscues when reading orally on post-tests than they had made when reading orally on pre-tests. They also made greater measured gains in reading comprehension than did the Comparison Group students.

Comparing the results of the Reader Self-Perception Scale, students in the Intervention Group demonstrated greater self-efficacy about reading than students in the Comparison Group. Mean scores on post-tests, compared to mean scores on pre-tests, indicated that the Intervention Group students made gains in all RSPS categories. Gains were greater than those made by the Comparison Group students who provided data on the RSPS. When comparing "matched pairs" of students with similar identified learning disabilities, the students in the Intervention Group consistently made greater gains between pre- and post-test scores in terms of perceived progress, observational comparison, social feedback and physiological states while reading.

Guided Oral Reading Differences

In comparing the Intervention Group and Comparison Group results, it is important to take into consideration any mediating influence that could have contributed to the differences in net gains in reading skills and in students' perceptions of themselves as readers. One possible mediating influence is the quality of the guided oral reading session with the teacher-researcher alone compared to the guided oral reading sessions where the therapy dog was present.

The presence of the therapy dog contributed to a perception of the guided oral reading as "fun" for the Intervention Group students. Involving the dog in teacher-student conversations about the text while reading may have played a part in this. During guided oral reading, all of the students who participated in the study received instruction in "embedded comprehension" while reading. Research has shown that such active, independent construction of meaning from the text helps to build reading comprehension skills (Algozzine et al., 2009, Scull, 2010, Idol, 2010, Katz & Carlisle, 2009, Kesler, 2010, Rasinski & Hoffman, 2003, Magno, 2010). For Comparison Group students, the conversations about the text, unfamiliar words, vocabulary, and characters were conversations between the student(s) and the teacher. For the Intervention Group students, these conversations often included the therapy dog. Students could "explain to Kela" what was happening in the story or what they thought a challenging word might be. According to Intervention Group reading journals and post-intervention interviews, this helped to make guided oral reading "fun" and, at times, "exciting".

The therapy dog also reduced any feelings of embarrassment or anxiety that students may feel about tracking with their fingers as they read. Many of the researcher-teacher's students have visual processing and/or attention and focus challenges which make it difficult for the students to track while reading. To facilitate tracking, students are encouraged to move their fingers beneath words as they read, especially in the early grades. This is modeled by the teacher-researcher in all guided oral reading sessions. For students in the Intervention Group, finger-

tracking could be framed as "showing Kela the words." This reframed tracking with the finger so that it could be done for the therapy dog's benefit rather than because the students needed help tracking, which may have made students feel better about tracking with a finger as they read. This also may have contributed to a difference between guided oral reading with the teacher-researcher alone and guided oral reading in the presence of the therapy dog.

There were also differences between the two groups in terms of the opportunity to self-select reading material and in the re-reading that was done. Students in both the Intervention Group and the Comparison Group often read core texts or classroom literature books during guided oral reading. Peer-assisted oral reading and repeat-reading were, for all students, practiced through the reading of core content material. For example, passages from the Science, Social Studies and literature books would be read in class or independently and then, at times, re-read during guided oral reading sessions to facilitate written class work that was required in those core subjects. At times Comparison Group students were able to read material of their own choice during guided oral reading sessions. This included reading to the researcher-teacher from books that they were reading for pleasure. When reading a book of their choice during guided oral reading, students were encouraged to re-read the end of the previous chapter before reading a new chapter and to explain what had happened in the story up to that point. Re-reading was also done to facilitate the writing of book reports, helping students to clarify character traits, plot and setting.

For students in the Intervention Group, re-reading was done with core texts to facilitate written work for class assignments (including book reports) exactly as was done with the Comparison Group students. But in addition to this, students in the Intervention Group would sometimes read or re-read a story that he or she thought the dog would like. For example, the therapy dog knows the word "cookie" and perks up her ears when she hears that word. Therefore, several of the Intervention Group students, after reading the Frog and Toad story "Cookies" during instructional time that did not include the therapy dog, asked if they could read it again during a reading session with the therapy dog "because Kela loves cookies!" Again, Intervention Group students described this kind of re-reading as "fun" whereas re-reading done during guided oral reading with the Comparison Group students was generally done to support their success in the core curriculum and was not necessarily perceived by the students as a fun or enjoyable activity.

Anything that is considered to be fun is more likely to be motivating. Therefore, it may be that the guided oral reading sessions with the therapy dog, perceived as being a fun or enjoyable experience, increased students' motivation to read. This will be discussed further in the section of this chapter entitled "Motivation's Role in The Results".

Discussion

The results from the GORT-4 offer the most convincing evidence for the effectiveness of incorporating a certified therapy dog into guided oral reading

sessions. The BRI test scores for the Intervention Group students provide additional evidence for the effectiveness of the intervention. The BRI tests were not administered by the researcher but instead, by students' general education teachers and yet the pre-test and post-test BRI scores show very similar gains in reading skills as were shown by the GORT-4 scores (both in terms of individual student growth and mean scores for the Intervention Group as a whole). It is important to note that there were some inconsistencies among the general education teachers in terms of administering the BRI. And even though both the BRI and the GORT-4 provided strong evidence for the growth in reading skills for the Intervention Group students, it must be noted that the sample size for the Intervention Group was small and that the length of time that participants were involved in the study varied (some in Phase I, some in Phase I and II, some in Phase III).

There were additional limitations to the ability of this study to provide empirical evidence for the effectiveness of the intervention. The study was designed to be quasi-experimental in that pre- and post-test scores were to be compared for students who received the intervention with "matched" students (matched by identified learning disabilities and by grade-level) who received guided oral reading without the presence of the therapy dog. However, as mentioned in Chapter 3 under Methodological Limitations, time constraints prevented the researcher-teacher from collecting data from Comparison Group students with the exception of BRI scores and four Reader Self-Perception Scale scores. One must consider these limitations to the methodology of this study when drawing conclusions regarding the effectiveness

of the intervention. Still, on all of the specific reading skills that were measured by students' general education teachers on the Basic Reading Inventory (BRI) pre- and post-tests, students who participated in the intervention made greater gains as a group than the group of participating students who received literacy instruction that did not include the presence of a therapy dog during guided oral reading sessions. Therefore, both the pre- and post-testing done on the GORT-4 and pre- and post-testing done by general education teachers on the BRI provide evidence that the intervention was effective in significantly raising the scores of the Intervention Group students for reading rate, accuracy, fluency and comprehension.

For the intervention, students received ten guided oral reading sessions with the researcher-teacher in the presence of a certified therapy dog. These sessions only lasted 10-15 minutes. How could 100-150 minutes of reading instruction result in such notable gains in reading skills? While guided oral reading can result in dramatic increases in reading skills, it appears to this researcher that it was not simply the reading sessions with the therapy dog that contributed to the measured gains that participants made in their reading skills. In discussing the measured dramatic increases in reading skills for Intervention Group students, three possible mediators between animal-assisted instruction and reading outcomes are discussed: motivation to read, self-efficacy and confidence in reading, and the role that anxiety plays in reading for students with identified learning disabilities that affect their acquisition of literacy skills.

Motivation's Role in the Results

Research indicates that the amount of reading done by a child is linked to reading fluency and comprehension and is strongly associated with reading achievement on standardized tests such as the Gates-MacGinitie Reading Comprehension Test (Wigfield & Guthrie, 1997, Guthrie, 2004, Guthrie et al., 2006). However, students who experience difficulty in acquiring literacy skills are not motivated to engage in reading or other academic activities that require reading (Guthrie, 2004, Guthrie et al., 2006, Schunk & Pajares, 1997, Whitehurst & Lonigan, 2003, Wigfield & Guthrie, 1997). Research has found that animals can arouse and focus attention and provide situational motivation for reading (Guthrie et al., 2006). The authors found that, "when students experience multiple situational interests in reading, accompanied by perceived competence, autonomy, or relatedness in reading activities, then students increase their intrinsic reading motivation." (Guthrie et al., 2006, p. 244) Therefore, it could be that the presence of the therapy dog during guided oral reading provided situational motivation for oral reading because students wanted to read "to the dog". Repeated positive experiences of oral reading in the presence of the therapy dog appears to have increased intrinsic reading motivation for those students who read in the presence of the therapy dog.

The data collected in this study through three data-collecting instruments suggested that when students were given the opportunity to read to a certified therapy dog, it not only increased situational motivation to read (i.e., wanting to read "to the

dog" so willingly engaging in guided oral reading with a teacher) but also increased their intrinsic motivation to read. Parent questionnaires, reading journals and student interviews indicate that after reading with the therapy dog, students increased the amount of reading that they did at home, independently and during school. This increased the sheer volume of reading done by Intervention Group students over the course of this study well beyond the sessions that were included as part of the intervention.

Self-Efficacy's Role in the Results

Self-efficacy, belief in one's ability to learn and succeed at a task, plays a key role in motivation and in academic success. Research has shown that for students who struggle to acquire literacy skills, motivation to read has been affected by a lack of self-efficacy; repeated challenges with reading have reduce these children's feelings of self-efficacy in terms of believing in their ability to learn to read (Henk and Melnick, 1995, Schunk & Pajares, 1997). However, once the reading experience is perceived by the child as positive and successful, then the child's self-efficacy for reading has a good chance of improving and this could improve the child's motivation to read (Schunk & Pajares, 1997). This could increase the amount of reading done by the child, and offer the opportunity for increasing reading fluency, accuracy and comprehension.

Data collected in this study through multiple data-collecting instruments indicated that reading in the presence of a therapy dog was perceived by the students as

positive, "fun" (mentioned 49 times in Reading Journal entries), "cool" and even "awesome". Students also reported that they perceived their reading as "getting better" and perceived themselves as being "better" readers. Reading in the presence of the therapy dog did improve students' feelings of self-efficacy according to the Reader Self-Perception Scale as well as according to the data collected in the study through reading journals, student interviews, and parent questionnaires. After analyzing all of the data, it appears that increased self-efficacy, which increased motivation to read, may have played a part in increasing participant's reading at home as well as at school, and so contributed to Intervention Group students' measured increases in reading fluency, accuracy and comprehension on both the Gray Oral Reading Test and the BRI.

Anxiety's Role in Self-Efficacy

According to Schunk & Pajares (1997), self-efficacy influences motivation, which influences learning and so promotes achievement. Schunk & Pajares (1997) clarify that self-efficacy is built through self-appraisal as well as the appraisals they receive from others, and that part of this self-appraisal comes through their physiological reactions to their learning experiences. For children with identified learning disabilities that impact the acquisition of literacy skills, the physiological reaction to reading is often a tightening of muscles and an increase in blood pressure as they experience anxiety. Research has proposed that anxiety is both an underlying cause of and a result of reading challenges (Carroll & Iles, 2006, Neville et al., 1967, Zbornik, 2001). Studies have shown that when children are reading out loud, anxiety (as measured by increased blood

pressure) rises. Research has also demonstrated that anxiety can be reduced (as evidenced by lowered blood pressure) by the simple presence of a trusted animal (Lynch, 2003).

The results of this study support prior research that suggests that anxiety can be reduced by reading in the presence of a trusted animal. The Anxiety Scales that were filled out by study participants before and after each reading session indicate that if anxiety was noted prior to reading, it was reduced 90% of the time after reading in the presence of the therapy dog. Anxiety scales indicated that, after reading in the presence of the therapy dog, there was no anxiety noted at all by the students for 87% of the responses. Data collected on the Reader Self-Perception Scale (questions coded for students' perceived physiological states while reading) provided evidence that the intervention contributed to an increase in "internal comfort" while reading, which has been linked to a decrease in anxiety about reading (Henk & Melnick, 1995, Magno, 2010, Zbornik, 2001). Data collected through interviews, reading journals and parent questionnaires also suggested that reading in the presence of the therapy dog decreased students' anxiety about reading, including decreased anxiety about reading out loud.

Summary

The results of this study support the theory that reading in the presence of a therapy dog reduces students' anxiety when reading, which may not only allow students to read better while reading in the presence of the therapy dog, but may

provide a positive experience with reading so that anxiety about reading in general may also decrease. As anxiety about reading decreases, reading can be perceived as an enjoyable rather than a stressful activity. Reading in the presence of a therapy dog provides the opportunity to practice oral reading and to engage in re-reading of material through an activity that is perceived to be "fun". Reading to an animal can provide children with a paired reading experience that is similar to that of reading with a peer yet is free of anxiety about corrections done by the peer that could be interpreted as criticism.

Data collected through reading journals and interviews suggested that students who enjoy reading in the presence of a therapy dog experience reading as positive and successful. The results of this study indicate that this supported an increase in self-efficacy and confidence in reading skills, which has been linked to motivation to read. Reading in the presence of a therapy dog can, therefore, motivate reluctant readers to read out loud more often, both in the school setting and at home. This increase in sheer volume of what is read by the student may contribute to enhanced reading skills.

The data collected and analyzed for this study allowed this researcher to answer the research questions that were framed for the study. However, there is something beyond these specific questions that bears further investigation. It seems to this researcher-teacher that reading in the presence of the therapy dog did more than reduce anxiety, increase confidence and increase motivation to read. It seemed that

reading in the presence of the therapy dog "shifted" the reading experience for Intervention Group students. For students who participated in the study, reading became a positive experience and students who had dreaded reading out loud began to ask to read to the therapy dog. Some began to ask to read out loud even on days when the therapy dog was not at school. Some commented (in reading journals and in post-interviews) that they were reading more at home. Parent questionnaires confirmed that the students were reading more at home and seemed to enjoy reading more than they had before they participated in the intervention.

When reading with the therapy dog, students relaxed. They felt comfortable and were not worried about making mistakes. As students read in the presence of the therapy dog, they gained confidence in their reading skills. As their confidence grew, so did their skills. Instead of building failure upon failure (as they had done for years before being identified as qualified to receive special education support), students began to build success upon success. They began to see themselves as "readers". This is a reflection of self-efficacy, and surely self-efficacy plays a role in the "shift" that occurred for so many of the Intervention Group students. But the acceleration in reading skills was such that six of the nine Intervention Group students were able to read grade-level texts following the intervention. Prior to participating in the intervention, only one of these students was approaching grade-level in reading and the other five students were reading significantly below grade-level expectancies. Therefore, an examination of what contributed to this "shift" in reading and the "shift" in student's perception of themselves as readers is warranted.

A shift in students' perception of themselves as "non-readers" or "bad readers" to a perception of themselves as "readers" or even "great readers" has happened with many students over this researcher-teacher's 28 years as a Resource Specialist Teacher. It is not uncommon for students in the Resource Specialist Program to suddenly "catch on" to reading and make rapid gains. These students can make exceptional gains because they are coming from being so far behind grade-level expectancies. It seems that part of what allows them to "catch on" is turning around a perception of themselves as poor readers to a perception of themselves as good readers.

Part of what this researcher-teacher does to facilitate a shift in students' perception of themselves as readers is to directly teach literacy skills (phonemic awareness, phonics and reading comprehension skills), scaffold reading experiences to support success (including guided oral reading) and to build rapport with students so that words of praise and encouragement can help struggling students to believe in themselves. What is interesting about students' experience of the animal-assisted literacy instruction is that the students who participated in the intervention felt a rapport with the therapy dog that served a similar purpose, encouraging students and helping them to believe in themselves as readers.

Seven of the nine students who participated in the intervention mentioned that they enjoyed reading to the therapy dog because she "listens" as they read, and appeared as if she was enjoying their reading and cared about the story. Many also mentioned

that she cares about them. One student mentioned, several times, that she reads better in the presence of the therapy dog and enjoys it so much because she "feels loved". When talking with this student, she said she liked reading with the dog because the dog listens. The researcher asked if she didn't listen well to this student's reading. The student replied, "Well, Kela perks up her ears!" This student believed that if Kela perked up her ears, it meant that she was paying attention, that she was really listening. It seems that Kela's non-judgmental, attentive listening contributed to this student's perception of reading with Kela as "fun" and "exciting". However, there were times when Kela seemed to be sleeping when students were reading and after these sessions, students still characterized the experience in their reading journals as being "fun". This raises the question of whether it is the "listening" or simply the dog's presence - and the children's positive feelings about dogs - that generates the excitement and feelings of comfort.

E.O. Wilson (1984) proposed that humans have an innate tendency to become alert, calm and focused when in the presence of the natural world. He termed this "biophilia". It has been proposed by some researchers that this is why children become more calm, engaged and attentive when animals are brought into the classroom (Kruger & Serpell, 2006, Lynch, 2006, Rud and Beck, 2000, Sorge, 2008, Guthrie et al., 2006). Lynch (2006) also proposed that there is a "physiology of exclusion" that goes back to our ancient ancestors, where a fight-or-flight response is activated by things that are seen as a threat and a "physiology of inclusion", a relaxed biological state, is experienced when one feels "safe". Lynch proposed that for some

children, animals trigger this "physiology of inclusion" and these children remain calm even when presented by academic tasks that would ordinarily trigger a fight-or-flight response (such as oral reading for a child who has struggled with reading and therefore feels anxiety when asked to read out loud).

Future Research

Future research could investigate the neurophysiology of animal-assisted literacy instruction. Can the "calm state" that students have experienced when reading in the presence of a therapy animal be traced to a brain chemical or a physiological reaction more specific than the reduced blood pressure that has already been determined (Lynch, 2006)? Since E.O. Wilson (1984) proposed "biophilia" as a tendency to become more calm and alert when one is in the presence of the natural world, are there ways to provide students with this experience other than reading in the presence of a therapy dog? For example, could reading in an outdoor setting or next to a fish tank evoke a similar "calm state" due to what E.O. Wilson has termed "biophilia"?

Would the presence of a therapy dog be effective for students who are not comfortable with dogs? This might also be investigated by future research. The students who participated in this study were comfortable around dogs. While only two of the nine Intervention Group students had a dog at home, five of the nine had pets at home. On the student interview, one of the questions asked, "What do you think about dogs?" On the pre-intervention interview, only one student expressed hesitation about dogs ("I like them but I'm allergic to them") and one stated, "I'm not

afraid of them". Other responses ranged from "fine" to "fun" and two students stated, "I love them!" It is interesting that on post-intervention interviews, "I love dogs!" was the response of five students, including the student who noted being allergic to dogs on the pre-interview. The student who had responded with "I'm not afraid of them" on the pre-intervention interview responded to that question on the post-intervention interview with, "They're great! I want a dog! They're the best!" For these two students, the intervention changed not only their reading, but also their expressed feelings about dogs. A similar change in student attitudes about dogs was noted in the study conducted by Smith & Meehan (2010). Future research may wish to investigate this further.

Animal-assisted literacy instruction with animals other than dogs should be included in future research. In this researcher's 28 years as a Resource Specialist Program teacher, various animals have been utilized to provide motivation for students and to support guided oral reading. There have been reading rabbits, newly-hatched chicks, goslings, quail, a rooster and a little red hen in this researcher-teacher's RSP classrooms over the years. Rud and Beck (2000) studied animals in the general education classroom but very little research has been done on the benefits of animals in classes for children with special needs. Although a dog has the advantage of being house-trained and a certified therapy dog presents very little risk to students, other animals should be studied for their effectiveness in animal-assisted literacy instruction.

Future research should include investigations of the impact of "unconditional listening" during guided oral reading. This is especially important for students whose identified learning disabilities cause them to make numerous miscues when they read. Students who participated in guided oral reading with the therapy dog indicated in interviews and in reading journals that they believed that the dog was "listening" and most students stated that they believed the dog "liked" the stories that they read, which students noted made reading "fun". Some students mentioned that the dog "didn't criticize". Was it the connection that students had with the therapy dog that allowed them to perceive the experience of reading in such a positive light, or could guided oral reading be as effective without the presence of a therapy dog if the teacher, a peer, another animal or a simulated (stuffed) animal were perceived by the student as being without judgment or as being attentive and "non critical" of the student's reading when listening to the student read?

The difference between self-selected reading material and teacher-selected reading material during guided oral reading also bears further investigation. All the students who participated in the study, Comparison Group and Intervention Group alike, engaged in guided oral reading with the researcher-teacher throughout the study. However, the students in the Intervention Group had more opportunity to self-select what they read to the therapy dog and often chose stories that they thought she would enjoy hearing. It would be interesting to investigate whether there was a difference between guided oral reading with a therapy dog where all reading done by students

was selected by the researcher versus guided oral reading with a therapy dog where what was read was chosen by the student.

Future research might also investigate what is involved in the "shifting" of student perceptions of themselves as readers. Is there a "threshold" in the acquisition of literacy skills that allows a struggling student to suddenly "catch on" and move forward rapidly in acquiring literacy skills? If so, where is that point and what is it about the animal-assisted literacy instruction that facilitated six out of nine Intervention Group students reaching this "threshold" with just one to seven months of intervention?

This study demonstrated measurable gains for all of the students who participated in the investigation. But will students continue to make progress after the intervention is no longer available? Future research should include longitudinal studies. Students who participated in this study continued to make gains after the intervention sessions were completed. June 2013 BRI scores obtained by these students' general education teachers indicate that students have continued to make progress beyond the post-test scores that were obtained by this researcher. Will this increase in reading skills continue? Have students truly "bridged the gap" that once existed between their reading skills and reading skills that would allow them to access grade-level material? Following students who have participated in animal-assisted literacy instruction would allow researchers to determine whether the continued increase in students' reading skills that has been observed by this researcher is typical

for students who participate in animal-assisted literacy instruction. Longitudinal studies would not only measure gains made after ten sessions of guided oral reading with a therapy dog, but could determine whether measured gains were temporary or whether the gains were built upon and so contributed to lasting gains in reading skills.

Future studies should investigate the effectiveness of incorporating a certified therapy dog into other types of literacy instruction. Research supports guided oral reading as an effective strategy for increasing literacy skills and this study indicates that incorporating a certified therapy dog into guided oral reading increased the effectiveness of that intervention for the students with identified learning disabilities who participated in this study. But would incorporating a therapy dog into other types of literacy instruction result in similar gains in reading skills for students? Would phonics instruction, for example, be more effective with a therapy dog present? Would students make similar gains to those found in this study if a therapy dog is incorporated into literacy instruction that does not include any guided oral reading? This bears further study (although in this researcher-teacher's opinion, it would be a disservice to the students to deprive them of guided oral reading instruction even if a therapy dog were present for the instruction they received).

Animal-assisted instruction in other academic subjects should also be included in future research. As mentioned above, this researcher-teacher has used chicks, goslings, quail, rabbits, chameleons and other animals to facilitate student learning in her RSP classrooms. The animals have provided motivation for students to engage in

written language since many of the students wrote about the animals as practice for their IEP written language goals. Other students who did not have IEP goals for reading or written language were able to benefit from having the animals in the classroom since on-task behavior and work completion earned them time with the classroom animals. Students with behavioral goals were willing to improve their behavior in order to hold a chick, rabbit or gosling. During Phase III of the study, one student who had been struggling to focus in her general education class was given a behavioral contract where the reward was walking the therapy dog once a week. For this student, that reward prompted a noticeable improvement in her focus and behavior in her general education class. This warrants further study. Students with anxiety about math also seemed to benefit from the calming effect of the therapy dog and other animals in the classroom. One of this researcher-teacher's students had a great deal of anxiety about taking math tests. On days that the therapy dog was at school for the study, this student was able to pet the dog while engaged in math tests and other math activities. The presence of the therapy dog seemed to help this student to complete math tests and math assignments in a shorter amount of time and with less apparent anxiety than was typical for her. The use of animals for students' behavioral needs as well as a variety of academic needs should be researched.

Future research should include studies with students who have a wide variety of identified learning disabilities. The students in this study all have identified learning disabilities in the areas of visual processing, auditory processing and/or attention and focus challenges. Students with other identified learning disabilities should be

included in future studies. This is especially important for students who have Autism Spectrum Disorder since this is a growing population of special needs students.

There was one student with Autism Spectrum Disorder who participated in the intervention during Phase I of the study. Receiving eight reading sessions over the course of one month, this student made measurable gains (five to seven month's growth) in reading rate, accuracy and fluency on the GORT-4. He also increased his fluency, accuracy and comprehension according to the BRI tests given by his general education teacher. He was not included in the Intervention Group for this study because he only completed eight sessions with the therapy dog rather than ten sessions. He moved in the fall and so was not able to participate in Phase II of the intervention in order to receive two more intervention sessions. But he responded very well to the intervention. His mother's post-intervention questionnaire (not included in the data analysis for this study since he was not included in the study) stated that he improved a great deal "because of the therapy dog". Another student with Autism was on the researcher-teacher's caseload during Phase I of the study. He did not participate in this study because he was reading on grade-level and so did not have IEP goals for reading. However, this student responded very well to the therapy dog and to other animals that have been included in this researcher-teacher's classroom during the two years that she taught this student. Therefore, it appears that animal-assisted instruction may be an effective intervention for children with Autism Spectrum Disorder. Future studies that include children who are on the autism spectrum are recommended.

Implications

The implications for this research are two-fold: (a) This study on Animal-Assisted Literacy Instruction adds valuable information to the body of knowledge that informs educators about ways to improve the acquisition of literacy skills for children who have been struggling to meet grade-level standards in reading due to identified learning disabilities, and (b) this research supports a potentially powerful intervention that may allow special needs students to "bridge the achievement gap" that currently exists between their current literacy levels and grade-level expectations.

Implications for Improving the Acquisition of Literacy Skills

This study highlights the role that anxiety plays for children with identified learning disabilities that impact their acquisition of literacy skills. Research has shown that anxiety is a result of the repeated challenges with reading that are experienced by children with identified learning disabilities (Carroll & Iles, 2006) and that this anxiety then contributes to the challenges that student have with reading, particularly oral reading (Carroll & Iles, 2006 and Neville, Pfof & Dobbs, 1967). While there may be other ways to reduce anxiety during reading, this study provides a plausible intervention for reducing anxiety during and about reading for students with identified learning disabilities who have struggled to acquire literacy skills.

This study also highlights the role that self-efficacy and confidence play in the acquisition of reading skills for students with identified learning disabilities, particularly the role it plays in motivating students with learning disabilities to engage

in activities that require reading. While there are many strategies that can be used to build self-efficacy and promote motivation to read, this study demonstrates that guided oral reading in the presence of a therapy dog can build students' confidence in their reading skills, shifting their perception of themselves from "bad" readers to "good" readers, which can lead to accelerated gains in reading skills.

This study demonstrated that increased motivation to read was one of the contributing factors to the accelerated gains in reading skills that were made by the students who participated in the intervention. Data collected in this study indicated that reading in the presence of a therapy dog improves situational motivation to read orally and to engage in guided oral reading with the teacher. Data also indicated that reading in the presence of a therapy dog improves intrinsic motivation to read. An improvement in intrinsic motivation to read can lead students to read more at home, in school and independently. This increases the sheer volume of what is read, which has been linked to increased reading skills and an increase in academic achievement (Guthrie, 2004, Guthrie et al., 2006, Whitehurst & Lonigan, 2003, Wigfield & Guthrie, 1997).

Policy Implications

A reading intervention that can demonstrate results after just 10 sessions bears consideration in terms of school policy. "Therapy Dogs" are becoming more and more common in our society. Recent articles found in the popular press relate stories of therapy dogs being helpful in hospitals, rehabilitation centers and homeless

shelters. Therapy dogs are now used in some airports to soothe anxious travelers. Recently, therapy dogs have been brought onto college campuses during finals weeks to reduce anxiety and promote academic success (Turner, 2012). "Reading dogs" are becoming common in libraries across the United States and in other countries as well. Many of these programs rely upon trained volunteers and therefore are not expensive to implement. Yet therapy dogs, including "reading therapy dogs", are still rare in our schools.

This study demonstrates that animal-assisted literacy instruction can be a powerful intervention. Incorporating a certified therapy dog into guided oral reading sessions is an intervention that may allow special needs students to "bridge the achievement gap" that exists between their current literacy levels and grade-level expectations. When this gap is bridged, there is the possibility for these students to not only experience greater success in the school setting, but to have greater opportunities available to them in their adult lives. Therefore, incorporating a therapy dog into guided oral reading sessions should be considered by educational policy-makers as a viable intervention for students with special needs who are reading below grade-level expectancies.

When considering the benefits of animal-assisted literacy instruction, policy-makers will want to consider (a) teachers' ease and familiarity with dogs and other animals, (b) students' ease and familiarity with dogs and other animals and (c) individual animals' temperaments and suitability to be safely and effectively

incorporated into classroom instruction. Animal-assisted literacy instruction is not necessarily for everyone. But this study does add to the growing body of literature that indicates that animal-assisted instruction can support student learning. For teachers and students who are comfortable with dogs and other animals, it can provide an effective intervention.

For all of the students who received the animal-assisted literacy instruction in this dissertation study, there were measurable gains in their reading rate, fluency, accuracy and comprehension. Six of the nine Intervention Group students have gone from reading significantly below grade level to approaching grade-level if not yet passing grade-level benchmarks. The results reported in this dissertation by the teacher-researcher were validated by testing that was done by the students' general education teachers. For these six students, the "achievement gap" is closing. For two of these six students, the IEP team has recently determined that an IEP goal for reading is no longer required. They are now within the "instructional range" of their general education classes and are able to access their grade-level texts and supplemental reading materials without RSP support. For all of the students who participated in the study, the gains that they made were greater than would be expected given the length of time during which these students participated in the intervention. This is the goal of all specialized academic instruction that is provided to students with learning disabilities who receive special education services to support their progress in reading. The need to bring these students up to grade-level in reading as swiftly as possible is critical. The results obtained through this study

demonstrate that animal-assisted literacy instruction is an intervention that bears further study and consideration for broader implementation in our schools.

Appendices

Included in Appendices are a glossary of terms, a sample reading journal page, pre- and post-student interview protocols, and the pre- and post-intervention parent questionnaire.

Appendix A:

Glossary of Terms

AAI (Animal-Assisted Intervention): the practice of incorporating animals into treatment interventions in order to facilitate specific therapeutic goals such as increased social interactions with peers (AAT) or to enhance the quality of life (AAA, Animal-Assisted Activities that provide motivational, recreational or therapeutic benefits but are not designed to meet specific goals) (Kruger & Serpell, 2006)

AAT (Animal-Assisted Therapy): an Animal-Assisted Intervention that is designed to meet specific therapeutic goals is implemented by a professional with specialized expertise and includes measured progress on the specified goals and objectives. (Kruger & Serpell, 2006, p. 23)

ADD/ADHD: ADD is Attention Deficit Disorder. ADHD is Attention Deficit (with) Hyperactivity Disorder. ADD is a sub-category of ADHD. There are three types of ADHD: Inattentive, Hyperactive and mixed. Screenings for ADHD can be done through checklists of behavior that are filled out by parents and by the child's classroom teacher(s). Behaviors that indicate that a student may have ADHD include difficulty attending/focusing and, for Hyperactive ADHD, an increase in physical activity and impulsivity. A formal diagnosis of ADHD is usually made by a physician, who may prescribe medication to facilitate greater focus. Diagnosis can also be made by an outside-of-school evaluator with expertise in ADHD or by the school psychologist or the mental health therapist. ADHD is an identifiable learning

disability. When the diagnosis is made by a physician (and sometimes when the diagnosis is made by an outside-of school evaluator or by the school psychologist), the identified learning disability is usually placed in the Other Health Impaired category of learning disabilities. When the diagnosis is made by the school psychologist (and sometimes when the diagnosis is made by an outside-of-school evaluator), the identified learning disability usually falls under the Specific Learning Disability (SLD) category as an identified processing disorder.

Discourses: "Ways of combining and coordinating words, deeds, thoughts, values, bodies, objects, tools, and technologies, and other people (at the appropriate times and places) so as to enact and recognize specific socially situated identities and activities" (Gee, 2003, p. 30). Social speech (Alfassi, 2009)

Dyslexia: According to Tunmer & Greaney (2009), dyslexia is defined as "(a) persistent literacy learning difficulties (b) in otherwise typically developing children (c) despite exposure to high quality, evidence-based literacy instruction and intervention (d) due to an impairment in the phonological processing skills required to learn to read and write." (Tunmer & Greaney, 2009, p. 239) Reading challenges that are typically ascribed to dyslexia (including the tendency to miscue while reading, with errors of letter/word omission, addition, substitution and transposition) are, in special education evaluations, often determined to be due to specific visual processing deficits (see definition below). Identified challenges with auditory processing and/or attention and focus may also contribute to the reading challenges that are typically

ascribed to dyslexia. In this research proposal, I have used the term dyslexia and dyslexic only where that term was used by the researchers whose work is being discussed (Singleton, 2005, Carroll & Iles, 2006). The term dyslexia is not commonly used, professionally, in special education in the United States at this time.

Identified Learning disabilities: learning challenges that have been identified by a psychologist or, occasionally, by a physician or an evaluator outside of the school setting who has expertise in this field. Identified learning disabilities include Specific Learning Disabilities (SLD, which includes visual processing challenges, working memory challenges and fine motor delays), Speech/Language Disabilities (which include challenges with auditory processing, auditory memory, and expressive and/or receptive language skills), Autism, Emotional Disturbance, and Other Health Impaired (which includes ADHD and other health challenges that interfere with expected academic progress).

IEP (Individualized Educational Plan): an individualized plan designed to promote academic achievement for students with identified learning disabilities who have been found to qualify to receive special education services. The IEP is developed by the IEP team. The IEP Team always includes the student's parents, general education teacher, special education teacher, school administrator or administrative designee and, for initial and triennial IEP meetings, a school psychologist. When evaluating and/or providing services for a student, specialists are also included on the IEP team. Specialists include the Speech/Language therapist, the Occupational Therapist, The

Adaptive Physical Education teacher, the Behavior Inclusion specialist, counselors and other professionals who are asked to be a part of the team by parents and/or other team members. The IEP includes present levels, educational setting, statewide testing accommodations (if any), service recommendations (type of support and specific times for each service), accommodations and modifications to support students' progress in the general education as well as the special education setting and goals that are designed to meet students' academic, social and/or behavioral needs and support successful inclusion in the general education curriculum. For students in special education an IEP meeting is held at least once a year to review progress and placement in special education and to update services and goals.

Miscues: words that are mis-read while reading, usually noted during oral reading sessions. Miscues are more numerous for students who have visual processing challenges because words can be mis-perceived (see Visual Processing Challenges, below). Miscues are also more numerous for students who have attention/focus challenges because students with attention/focus challenges do not attend as closely to the form and phonology of the words they are reading.

Phonemes: individual sounds formed by one or more letters. Phonemes are the smallest units that compose language

Phonemic Awareness: focusing on and manipulating phonemes in spoken syllables and words

Phonics: letter/sound correspondence as applied to written words (for decoding words when reading and encoding words when spelling). Phonics instructional approaches include Analogy Phonics (teaching unfamiliar words by analogy to known words), Analytic Phonics (teaching students to analyze letter/sound patterns in words), Embedded Phonics (teaching phonics in the context of reading), Synthetic Phonics (teaching the sounds for each letter and blending those sounds into words) and Phonics through Spelling (teaching students to attend to the sounds/phonemes in words to facilitate spelling phonetically)

Reading Accuracy: the number of words accurately read during a reading session or during a 1-minute timed reading of a passage. On the Basic Reading Inventory, the Brigance, the Gray Oral Reading Test and other commonly-used reading tests, reading accuracy is measured in terms of the number of miscues made while orally reading a selected passage. According to these tests, a maximum of 4 uncorrected miscues made in 1 minute of reading has been set as the criteria for determining that the passage has been read accurately.

Reading Comprehension: understanding what is read through an active construction of meaning that involves critical thinking on the part of the reader. For the purposes of this study, reading comprehension is determined by participants' answers to a series of questions that follow each grade-leveled reading passage during pre- and post-testing on Grays Oral Reading Test (GORT) and the Basic Reading Inventory (BRI). Questions are factual and inferential.

Reading Fluency: reading with speed, accuracy and proper expression. On tests such as the Basic Reading Inventory (BRI), which is used in trimester reading evaluations by many schools, reading fluency is determined simply by the number of correctly-read words in a minute of oral reading. For the purposes of this proposed study, reading fluency will be measured by correctly-read words per minute for the BRI and by a combination of rate and accuracy when reading passages of the Gray Oral Reading Test (GORT).

Reading Rate: the speed at which a grade-leveled passage is read. On the Gray Oral Reading Test the amount of time required for a student to read a given passage is scored according to rates that are normed for the student's age. On the Gray Oral Reading Test, the rate and accuracy scores are combined to form the Reading Fluency score.

RSP (Resource Specialist Program): the least restrictive setting in which a student may receive special education support in the United States. Placement in the Resource Specialist Program is an IEP team decision. To be placed in RSP, a student must have an identified learning disability that is generally diagnosed by the school psychologist but may be diagnosed by an outside expert. There must also be a discrepancy of at least 1.5 standard deviations (usually 22 points) between the student's cognitive ability as measured by IQ tests (or similar tests that determine cognitive strengths and challenges) and his/her academic achievement in one or more subjects as measured by age-based Standard Scores on a test such as the Woodcock-

Johnson Tests of Academic Achievement or other standardized academic tests. RSP services are also determined by the IEP team and range from a minimum of consultation services only to over 525 minutes/week, depending upon the time needed to address IEP goals and objectives.

SDC (Special Day Class): a class offering special education support for more than 50% of the school day. A Special Day Class (SDC) usually offers support for students of similar special education needs. For example, there may be one class for children with emotional and behavioral challenges who require a very structured class in order to make expected academic and behavioral gains. Another class would provide support for children with cognitive delays who require a modified curriculum in order to make expected academic gains. Children in these classes are usually "mainstreamed" into an appropriate general education class for as much of the day as is feasible. There are times when students in a SDC setting make adequate gains and no longer require such intensive support. When this occurs, the IEP team meets to discuss whether a less restrictive special education setting could provide adequate support to ensure continued progress for the child.

Speech/Language Challenges: challenges in expressive language, receptive language and/or auditory processing that are found to impact academic achievement. Testing done by a Speech/Language therapist generally identifies these learning disabilities and if the IEP team determines that the child qualifies to receive special education support due to these identified challenges, then Speech/Language therapy is

offered. Speech/Language therapy may be provided as the only special education service that is received by a child or it may be provided in addition to RSP support and/or other special education services.

Visual Processing Challenges: identified challenges with visual perception, visual memory, visual sequential memory, visual form constancy, visual spatial relationships, visual closure, visual figure-ground, visual-motor skills, visual working memory, or a combination of these visual processes. Visual processing challenges are usually identified through testing done by a school psychologist using tests such as the Visual-Motor Integration Test (VMI), the Test of Visual Perceptual Skills (TVPS), the Beery Motor Free Visual Test or a combination of these tests. Cognitive testing also may shed light on visual processing challenges (for example, low scores on the "coding" subtest of the Wechsler Intelligence Scale for Children (WISC) or difficulty with "block design" or other subtests that measure non-verbal intelligence). Students with visual processing challenges often mis-perceive words when they read. Typical are errors of omission (leaving out letters in a word such as when they read "plant" for "planet"), errors of addition (adding letters to a word such as when they read "salt" for "sat"), errors of substitution (substituting letters in a word such as when they read "had" for "hid" and "his" for "him") and errors of transposition (transposing letters in a word such as when they read "gril" for "girl" or "lets" for "lest"). Although many people refer to these types of reading challenges as "dyslexia", this is not a term that is used in special education in the United States at this time. It is not used in special education referrals, evaluations or reports, nor is it used to guide IEP

goals or IEP team decisions. Therefore, in this research proposal the term "dyslexia" is only used when the researchers used that term. Otherwise, I use the term "visual processing challenges" or simply "identified learning disabilities".

Appendix B:

Student Reading Journal Sample Page

5-21-12

😊 😊 😐 😞 😡

1. How are you feeling right now? 1 2 3 4 5

2. How do you feel about reading right now? 1 2 3 4 5

3. How do you feel about reading out loud right now? 1 2 3 4 5

I Love it,
More Stories Julia Tells
"A Curse In the River" (pp 70-74)

Note: [redacted] was at P.E. when I asked
for her to come in to read. She was
not happy about it! After reading to
Kela, however, she was happy all-around! ☺

"If I read out loud to Kela
read more." and you, I know more
words like "through" or "thaw"

Appendix C:

Interview Protocol Pre- and Post-Intervention

Appendix B includes the pre-intervention student interview protocol and the additional questions that were added for the post-intervention interview. All nine Intervention Group students were administered both pre- and post-intervention interviews.

Student Interview Pre- and Post Questions

Questions about participant's feelings about reading:

1. Sometimes I really want to read something like a good story, a letter from my friend who lives far away or emails. Are there times when you really want to read something? (If yes or if it's not clear from what's already been said):

Tell me what makes you really want to read.

2. Do you like to read? (Why or why not?)

3. Do you like to read out loud? (Why or why not?)

(If not answered in previous questions)

4. Is it harder for you to read out loud than silently? (If yes) Why?

5. Do you like reading out loud with the teacher?

. With someone else?

. With a toy or something else?

6. How often do you read out loud?

7. Is there anything else you want to tell me about you and your reading?

Questions about participant's relationship with/feelings about animals:

1. Do you have any pets at home?

(If yes) What kinds of pets?

2. Have you ever talked to an animal? [Pause for brief response]

Have you ever read to an animal? (If yes) When? How often?

What did you think about that? (How did you feel about it? Was it fun?)

Was it easier to read to the animal than reading silently?

3. What do you think about dogs? [Do you like them?]

4. What do you think about having a dog in the RSP room?

5. Anything else you want to tell me about pets or about animals?

Additional questions added to post-intervention interview:

- (1) Do you think your reading has changed since reading with Kela? (If so) How?
- (2) Do you think reading with Kela has made you a better reader? (If so) How?
- (3) Has reading with Kela changed how you feel about reading? (If so) How?

Appendix D:
Parent Questionnaire Pre- and Post-Intervention

Dear Parents,

I am very grateful for your help with my survey. It is important to my research, and it takes about 5 minutes to fill out. Please return it to me by May 4th or as soon as is possible.

Thank you!

Ms. Treat

Please circle the answer that best describes your child's reading habits at this time.

1. How do you think your child feels about reading?

Dislikes reading Likes reading a little bit Likes reading Loves reading

2. How confident do you think your child is about his/her reading skills?

Not at all confident Somewhat confident Confident Very confident

3. Does your child ever feel motivated to read at home? Yes No

If so, what motivates him/her to read?

4. How often does your child read at home?

Never Once a week or less Twice a week or more Daily
(Q.#5 would be Never also)

5. How often does your child read **out loud** at home?

Never Once a week or less Twice a week or more Daily

6. How would you describe your child's feelings about reading **out loud**?

Does not like it Sometimes OK with it Likes it Loves it

7. Has your child ever talked to you about reading out loud? Yes No

If so, what has he/she said?

8. Does your child read:

- | | | | |
|--------------------------------|-----|----|---------------------------------|
| (a) To him/herself | yes | no | |
| (b) with a sibling | yes | no | |
| (c) with a toy | yes | no | If yes, what kind of toy? _____ |
| (d) with a pet | yes | no | If yes, what kind of pet? _____ |
| (e) with parent or other adult | yes | no | |

9. How much has your child improved in reading over the past 2-3 months?

Not much at all	Some	A great deal
<i>(skip to question 11)</i>		

10. If your child's reading has recently improved, what do you think helps to account for that Improvement? _____

11. Do you have anything else you'd like to add about your child's feelings about reading or about his/her reading habits?

Feel free to attach another page to respond to questions or to comment further.

Post-Intervention Additional Questions on Parent Questionnaire:

12. Do you think that reading with my therapy dog improved your child's reading skills?

Not at all	Not much	Improved somewhat	Improved a lot
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13. Do you think that reading with my therapy dog improved your child's confidence in reading?

Not at all	Not much	Improved somewhat	Improved a lot
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14. Do you think that reading with my therapy dog improved your child's attitude about reading?

Not at all	Not much	improved somewhat	improved a lot
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15. Do you have anything else you'd like to add about your child's feelings about reading or about his/her reading habits? *Any comments about your child's experience with reading in the presence of Kela (my therapy dog)?

Feel free to attach another page to respond to questions or to comment further.

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