

Effects of Reading with Adult Tutor/Therapy Dog Teams on Elementary Students' Reading Achievement and Attitudes

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Abstract

This study assessed the effect of reading aloud to handler/therapy dog teams on children's oral reading fluency using a post-test control group design with repeated measures. Forty-five children in grades 2-5 were assigned to one of two groups using a stratified random assignment designed to equate groups based on grade and sex. Both groups read aloud for 30 minutes per week for 5 weeks; Group One read with a handler/therapy dog and Group Two read to peers. After 5 weeks, the groups were reversed. Between-group and within-group differences were analyzed. Several statistically significant and large effect sizes were found. Findings generally suggested that reading aloud to an adult/therapy dog team tended to increase children's scores on a test of oral reading fluency much more than reading aloud to peers. No significant effects were identified on a survey of general attitudes toward reading administered to the children.

Keywords

animal-assisted activities – elementary school children – literacy tutors – therapy dogs – oral reading fluency

Read/Dog Programs as an Educational Intervention

A therapy dog is a calm, nonaggressive, obedient, well-groomed canine who has been trained to interact in behaviorally healthy ways with people and other dogs in a variety of educational and health-care settings. The goal of human interaction with these dogs is to provide the positive neurophysiological effects that have been documented in the research (Barker, Rogers, Turner, Karpf, & Suthers-McCabe, 2003; Barker & Wolen, 2008). These effects include reductions in the outward signs of stress (e.g., increased heart rate, blood pressure, perspiration) (Cacioppo & Patrick, 2008).

There is also some indication that positive human/dog interactions have reciprocal hormonal effects. When a bonded human/dog dyad interacts, it tends to elevate positive mood—a finding that has been attributed to increases in the production of the “feel good” hormone, oxytocin (Miller et al., 2009; Nagasawa Kikusui, Onaka, & Ohta, 2009; Olmert, 2013). For dogs—even those at a public shelter—there is some evidence that the stress hormone, cortisol, can be reduced through positive interactions with a human (Hennessy et al., 1998). These data are inconclusive, however, and have not, to the best of our knowledge, been replicated with therapy dogs.

Most therapy dogs have passed the American Kennel Club's Canine Good Citizen test and the dog/handler team also passed a more advanced test. These dog handler/therapy dog teams are then registered and insured with organizations such as Pet Partners, Therapy Dogs International, Inc., Alliance of Therapy Dogs or Therapy Dogs United. Some well-known, international volunteer programs that focus on supporting children's reading through canine-assisted therapy are the Intermountain Therapy Animals' Reading Education Assistance Dogs (R.E.A.D.) Program, affiliated with Pet Partners (Klotz, 2013); Tail Waggin' Tutors of Therapy Dogs International, Inc. (www.tdi-therapydogs.org); and Reading with Rover (www.readingwithrover.com). Without a doubt, these programs demand major time and resource commitments from the volunteers, collaboration with teachers and administrators, permission from families, and modifications to the usual school routines (Jalongo, 2005). In consideration of this, the documented benefits of “read/dog” programs need to go beyond enthusiasm for the intervention. The field needs to accumulate evidence that a particular program improves the reading skills of children beyond

what might be expected to occur during the normal process of maturation and beyond the gains children could make from reading silently, with a peer, or with an adult volunteer only.

Researchers have suggested that therapy dogs have a positive effect on children's reading because they increase motivation and interest, are nonjudgmental, improve attention and focus, and reduce stress (Lane & Zavada, 2013). There is some qualitative case study support for such interventions (Bassette & Taber-Doughty, 2013; Friesen, 2010, 2013) as well as self-report and pretest/post-test intact group evidence (Newling, 2003; Shaw, 2013). Empirical research investigating the efficacy of these programs is just beginning to emerge.

For example, a study of the All Ears Reading Program conducted at the Veterinary School at the University of California-Davis demonstrated that public school children who read aloud with an adult handler/dog team improved their reading skills by 12 percent when compared to children who read with an adult only; in a subsequent study involving homeschooled children, the children improved their reading skills by 30 percent when reading with therapy dogs (Paddock, 2010). A study conducted at Tufts University reported that children who read to therapy dogs over the summer did not experience the decline in reading skills that frequently occurs over the summer months (see Skibbe, Grimm, Bowles, & Morrison, 2012), while a control group of students who read to a human volunteer only experienced the typical "summer setback" (Lenihan, McCobb, Freeman, & Diurba, 2011).

The purpose of this study was to investigate the effects of reading aloud with a handler/dog team on students' oral reading fluency and attitudes toward reading in one elementary school. The article begins with a brief description of effective reading instruction in the United States and the persistent reading difficulties of young children; next, it moves into motivation and interest, the theoretical base for the research; and finally, it describes the setting, participants, methods, results, and implications of the research.

Background

Expectations for the general population's literacy with print have increased dramatically throughout history (Binder & Kotsopoulos, 2012; Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009). To illustrate, during the Middle Ages, an adult male's ability to sign his own name—or even to "make his mark" by writing an X—was accepted as an indicator of literacy (Newman & Beverstock, 1990). Today, much more than this is expected in first grade.

The Common Core State Standards (CCSS) that set the literacy benchmarks for students illustrate this point (Porter, McMaken, Hwang, & Yang, 2011). For example, one CCSS benchmark for first graders is that they can “Demonstrate command of the conventions of standard English grammar and usage when writing or speaking,” something that many contemporary English-speaking adults throughout the world have not yet mastered.

Given these early and high expectations for literacy, the pressure is on for larger numbers of young children to reach unprecedented levels of proficiency in reading. Yet studies suggest that a child in a typical classroom does not amass the practice necessary to become a confident, fluent reader (Conderman & Strobel, 2008). Nationally, approximately one-third of all students—particularly those with attentional difficulties, those who are learning English, those with limited access to suitable reading materials, and those without support systems for practicing reading at home—fall behind peers in reading (Allington & Walmsley, 2007; Annie E. Casey Foundation, 2011). The reading achievement performance of these children is categorized as “below basic” and it is a pressing, national concern (National Assessment of Educational Progress, 2013).

In a typical classroom of twenty-something students, it is unlikely that a child would get more than a few moments of individualized, guided practice with an adult listening to him or her read aloud. Even when the total time allocated to all opportunities to read during school hours is calculated, the average is 12 minutes per day (Hiebert & Reutzel, 2010). Therefore, interventions that supply individualized practice in a cost-effective fashion that engages students are necessary.

Learning to read is a high-level conceptual task for a number of reasons. First of all, it requires the efficient orchestration of a wide array of skill sets related to a language’s phonology (sound system), syntax (symbols and structure), semantics (meaning system), and pragmatics (ways language is used to establish and maintain social interaction). Reading aloud can be a particularly daunting task for a reader (Fuchs, Fuchs, Hosp, & Jenkins, 2001). The requirements for oral reading—to name just a few—are that the child (1) quickly access background knowledge, (2) rapidly name commonly used words, (3) anticipate “what comes next” in the passage, (4) read with expression, (5) pause appropriately for punctuation, (6) pronounce unfamiliar words correctly, (7) self-monitor comprehension, (8) correct mistakes on the fly, (9) read with fluency, and (10) cope with concerns about peer ridicule.

As expectations for more independent reading of complex, content-area materials escalate during the intermediate grades, children who struggle with reading can become increasingly overwhelmed, frustrated, and defeated

(Vacca, Vacca, & Mraz, 2010). In extreme instances, children may even develop an array of anxieties associated with reading aloud in front of peers and teachers (Jalongo & Hirsh, 2010). Given this backdrop, the most common situation confronting teachers is that many students in a typical elementary classroom will not be motivated to complete various literacy activities, while more students still will be reluctant to read aloud. Student motivation may well be one of the most critical learning issues of the 21st Century (Hidi & Harackiewicz, 2000). The pressure on teachers to accelerate children's reading achievement may result in drilling basic skills that exacerbates the problem because, as a new monograph from the American Psychological Association reports, "Rote repetition—simply repeating a task—will not automatically improve performance. Effective practice is deliberate. It involves attention, rehearsal, and repetition and leads to new knowledge or skills" (Brabeck & Jeffrey, 2014, p. 1).

Theoretical Framework: Motivation and Situational Interest

There is an extensive body of research on the role that motivation plays in learning to read (Guthrie, 2011; Guthrie et al., 2006; Hidi, 2010). Motivation affects not only the willingness to initiate and persist at an activity, but also the level of engagement in the activity and the enjoyment derived from it (Jalongo, 2007; Kolencik, 2010). Based on a synthesis of the research, keys to motivation in reading aloud might be conceptualized as the "6 Cs": (1) choice—allowing children to select high-interest materials to increase task persistence; (2) challenge—matching materials to the child's reading level to build confidence; (3) control—giving children control of the book, such as deciding when to turn the page, when to linger over an illustration, or when to stop and talk; (4) collaboration—approaching reading with a "conspiratorial" we-can-do-this attitude from the tutor; (5) comprehension checks—encouraging readers to "recap" and make sense out of what they read and troubleshoot problems with understanding the text; and (6) consequences—demonstrating the positive outcomes of reading, such as having something interesting to talk about, getting useful information, finding answers to questions, and so forth (Aarnoutse & Schellings, 2003; Fawson & Moore, 1999; Naceur & Schiefele, 2005; Turner, 1997).

Of course, interest—defined as "an integration of feelings, motivation, and cognition" (Ainley, 2006, p. 391)—is essential to motivation (Artelt, 2005). When individual interest in a task is absent or insufficient, research supports the practice of building "situational interest" (Flowerday, Schraw, & Stevens,

2004). Situational interest relies on the novelty effect to make the less-than-appealing task more engaging by linking it with something else that piques the learner's interest (Renninger & Wade, 2001). Effective reading tutoring programs capitalize on situational interest (Ritter, Barnett, Denny, & Albin, 2009).

Volunteer tutors—defined as individuals who do not have professional teaching credentials but focus on supporting children's literacy—can exert a powerful and positive impact on children's reading (Otaiba & Pappamihiel, 2005). Interestingly, it is often the children who struggle the most with reading who make the greatest gains, so individual tutoring is well worth the effort (Pullen, Lane, & Monaghan, 2004; Slavin, Lake, Chambers, Cheung, & Davis, 2009). In a meta-analysis of 21 empirical studies of volunteer tutors and reading, the researchers concluded that “students who work with volunteer tutors are likely to earn higher scores on assessments related to letters and words, oral fluency, and writing as compared to peers who are not tutored” (Ritter, Barnett, Denny, & Albin, 2009, p. 20). Key characteristics of effective tutoring programs identified in the research include (1) appropriate training, mentoring, strategies, and materials for tutors; (2) access and opportunity to a wide variety of reading materials that are matched to readers' skills; (3) attention to each reader's choices, interests, motivation, general self-esteem, and self-confidence as a literacy learner; (4) sufficient time for learners to read with supportive guidance, feedback, and demonstrations from the tutors; and (5) high expectations for success in a supportive environment (Morrow, Woo, & Radzin, 2000).

Throughout the United States and internationally, programs have been implemented that use certified therapy dogs (to build situational interest) and leveled reading materials (to match books to students' skill levels), and work with children on a consistent basis with a trained literacy tutor (to provide individualized, guided practice reading aloud).

The following describes a 10-week study we conducted investigating the effects of reading aloud with an adult literacy tutor/therapy dog team on elementary students' oral reading fluency and attitudes toward reading.

Materials and Methods

Setting and Participants

The study was conducted at a private, K-12, non-denominational Christian school in Northwest Pennsylvania. A total of 45 students enrolled in grades 2-5 participated in the study. Current enrollment in grades 2-5 at the school consists of 42 Caucasian students, 4 Bi-Racial students, 1 African American student, and 1 Mixed-Race student; 31 females and 17 males are enrolled.

Instruments

Reading achievement was measured by use of curriculum-based measurement procedures. Specifically, oral reading fluency was the metric calculated to measure reading achievement. Years of research has indicated that oral reading fluency provides a good index of overall reading proficiency, including reading comprehension (Shinn, Good, Knutson, Tilly, & Collins, 1992). Attitude toward reading was measured via the Elementary Reading Attitude Survey or ERAS (McKenna & Kear, 1990). Worrell, Roth, and Gabelko (2007) found evidence to support the structural validity of the ERAS that was consistent with preexisting evidence of the instrument's construct validity. Moreover, they reported that the internal consistency reliability evidence associated with the instrument is substantial for a measure of attitudes in an elementary-age population. Although Kazelskis et al. (2004) found ERAS alpha coefficients suggestive of adequate internal consistency across gender, ethnicity, and grade levels, they also found that stability coefficients over a seven-day period were low.

Procedures

Following submission of a written description of the study, the study was approved by both the superintendent of the school and the executive director of Therapy Dogs United. All students enrolled in grades 2-5 were invited to participate in the study. A letter explaining the purpose of the study and requesting parental permission for children to participate was sent to all of the parents or legal guardians of children enrolled in these grades at the school. All parents of all children (with two exceptions) granted permission for their children to participate.

Next, child assent was obtained and all children consented to participate. We then randomly assigned all participating children to one of two groups. A stratified random assignment procedure (stratifying based on sex and grade level) was used to assign children to groups. This was done in an attempt to control for sex differences at each grade level. One group was then randomly selected to read to dogs twice a week for 15 minutes (30 minutes total per week) for the first five weeks (we call this the Dog-First group). During that time, the other group (we call this the Peer-First group) read to peers for the same amount of time. During the second five weeks, the groups were reversed (e.g., the Dog-First group read to peers and the Peer-First group read to dogs). The ERAS was administered prior to the initiation of the study (Pre), again at the end of week 5 of the study (Mid), and again after the completion of the study at the end of week 10 (Post). Similarly, oral reading fluency data were collected prior to the initiation of the study (Pre), after week five of the study (Mid), and after completion of the study after week 10.

The same reading probe/passage was used to collect oral reading fluency data at Pre, Mid, and Post. Additionally, the reading progress of all students was monitored weekly using different probes that were randomly selected each week. Probes were selected from the reading curriculum used in the school: *A Beka Reading* (Beka Books, 1995). This reading program begins teaching intensive, systematic phonics in pre-kindergarten. The material is reinforced in kindergarten, first, and second grades. One important feature of the *A Beka Reading* program is that no matter when a child begins as a student in this school—kindergarten, first, or second grade—the child still receives a complete phonics course in a single year.

The *A Beka Reading* program includes phonics wall charts and flashcards for classroom teaching, a phonics handbook and workbook, and a set of readers for each child. Each child takes a computerized test three times a year to assess her or his individual reading level. Using these reading levels, teachers determined each child's independent reading level. For the purposes of our study, children were allowed to choose a book to read to the handler/dog teams or peers, as long as it was within their identified independent reading level range. Weekly reading assessments/probes were based on grade-level material. Each child read for one minute. Words per minute were noted along with errors made. We used one-minute oral reading fluency probes because they are routinely used in the schools by teachers when monitoring reading progress.

Over the course of the study, one child moved out of the district, so these data were not included in the analysis. Another child who initially chose not to participate later chose to participate. With parent permission, this child participated from that point on, but the data were incomplete and therefore not included in the analysis. When reading to dogs, children sat with the leashed dog and the handler. A total of 3-4 children at a time read individually to a dog. Triads consisting of one handler, one dog, and one child were positioned in the corners of the classroom. Handlers and children typically sat on the floor next to the dogs, although a few handlers or children occasionally sat in chairs. Sessions lasted for 15 minutes and were timed by the handler. Upon entering the room, children selected the dog they wanted to read to, were introduced to the dog by name by the handler, and began reading immediately thereafter as prompted by the handler.

Over the course of the study, some children attempted to read to the same dog each week while others preferred to experience all of the different dogs. The handler provided periodic verbal encouragement, but did not correct the child or offer assistance unless requested to do so by the child. A total of 10-12 different dogs were used in the study and varied in terms of breed, sex, size, and color. When children read to peers, one child read to the other

for 15 minutes, and then they would switch. Children read to peers for a total of 30 minutes per week. This was done in a classroom under the supervision of a teacher.

All of the dogs used in the study were certified therapy dog teams registered with Therapy Dogs United, Inc. (TDU) and had passed both the standard American Kennel Club (AKC) Canine Good Citizenship Test, and a separate Therapy Dog Evaluation. All dogs were also independently certified by TDU after a review of their certificates, documents, and veterinary records. TDU certifies dogs and their volunteer handlers as a "team," and TDU volunteer handlers complete at least one New Volunteer Orientation and eight hours of continuing education in the field of early education/literacy, geriatric care/hospice, autism/special needs, physical/emotional/cognitive therapy, or social work. Prior to the initiation of the study, all volunteer handlers who participated in the study attended an orientation session during which they were briefed on procedures they were to follow during the times that children read to them and their registered therapy dogs.

Results and Discussion

Data Analysis

We analyzed differences between groups (i.e., different children) and within groups (i.e., same children) for the first five weeks and the second five weeks. We chose to analyze the data in two different, but related ways. First, we did an analysis of the pattern of the effect sizes between Groups (Dog vs. Peer) for Pre, Mid, and Post scores at each Grade Level (2, 3, 4, and 5). Effect Size (Cohen's *d*, 1988) was used to help describe and interpret Pre to Mid and Mid to Post changes in Words per Minute and ERAS scores. Cohen's *d* is conceptually more appropriate and easier to understand when interpreting our data than Eta-squared because it represents a standardized change in means from the beginning of a particular treatment (Dog or Peer) to the end of that one treatment. Eta-squared is the percentage of variance accounted for in the outcome variable by the grouping variable (Dog vs. Child) in a 1-way Analysis of Variance; percentage of variance accounted for is not as directly relevant or easy to conceptualize for the interpretation of our data.

Cohen's (1988) criteria for the classification of Effect Size is .20 = Small, .50 = Medium, and .80 = Large. To classify our effect sizes, we used the following criteria: Small = .00 to .34, Medium = .35 to .64, and Large = .65 and larger. We expected that the dogs would have an effect on reading achievement and

reading attitude, and we expected to see a pattern from Pre to Mid (first five weeks) in which the Dog-First group would demonstrate a larger effect size than the Peer-First group. Conversely, we expected to see a pattern from Mid to Post (second five weeks) in which the Peer-First group (which read to dogs during the second five weeks) would demonstrate a larger effect size than the Dog-First group (which read to peers during the second five weeks).

Second, we did a standard statistical significance analysis with $\alpha = .05$ which included Analysis of Variance with Repeated Measures and the Friedman test (similar to an Analysis of Variance with Repeated Measures using ranks) for each Grade to examine Dog vs. Peer differences and gains (Pre to Mid and from Mid to Post scores). We used Independent Samples *t*-tests and Mann-Whitney *U* tests (similar to the Independent Sample *t*-test using ranks) with adjusted $\alpha = .015$ ($.05/3$) to examine Dog vs. Peer differences (Pre, Mid, and Post scores). Dependent Samples *t*-tests and Wilcoxon signed-rank tests (similar to the Dependent Sample *t*-test using ranks) with adjusted $\alpha = .025$ ($.05/2$) for each Grade were used to examine separately Dog and Peer gains (Pre to Mid and Mid to Post). All appropriate statistical assumptions were checked. SPSS 19.0 (George & Mallory, 2011) was used for all statistical analyses. However, we did not necessarily expect to observe statistically significant differences between groups within grades because of the small sample sizes.

No statistically significant results or consistent pattern of findings/effect sizes that would suggest any kind of an effect of reading to dogs on reading attitude were identified. However, results did suggest an effect of reading to dogs on reading achievement (oral reading fluency), and these findings were outlined.

Within-Group Differences

Oral reading fluency gains: Pre to Mid (first five weeks). All Pre to Mid Effect Sizes were .30 or greater (See Table 1). One was classified as small, four were classified as medium, and three were classified as large. In Grades 2, 4, and 5 the effect size for children who read to dogs was greater than the effect size for children who read to peers, as would be expected if reading to dogs had a greater effect than reading to peers. In Grade 3 the opposite was true. The largest Effect Size difference between the two groups was for Grade 2. Pre to Mid average increases were statistically significant using Dependent Samples *t*-tests for all groups except for children in grades 2 and 4 who read to peers.

Oral reading fluency gains: Mid to Post (second five weeks). The Mid to Post Effect Sizes ranged from .08 to .62. Five were small and three were medium. In Grades 3 and 4 the effect size for children who read to peers was greater than

TABLE 1 Oral reading fluency (words per minute) gains by grade and group

Grade	Group	n	Pre		Mid		Post		Pre-Mid		Mid-Post		Effect Size	
			M(SD)	M(SD)	M(SD)	M(SD)	t	df	p	t	df	p	Pre-Mid	Mid-Post
2	Dog	6	62.0(37.6)	90.0(40.4)	102.8(46.4)	3.87	5	.012*	3.50	5	.017*	.82 ^L	.31 ^S	
	Peer	5	74.6(33.5)	91.0(29.2)	110.6(37.5)	2.38	4	.520	3.93	4	.017*	.48 ^M	.62 ^M	
3	Dog	6	89.5(11.1)	116.7(14.9)	126.5(26.7)	13.43	5	<.001*	1.34	5	.239	1.16 ^L	.48 ^M	
	Peer	7	95.4(31.6)	129.0(48.1)	137.4(42.7)	3.36	6	.015*	0.37	6	.721	1.43 ^L	.19 ^S	
4	Dog	5	126.2(48.1)	153.8(43.2)	158.8(51.5)	10.17	4	.001	0.83	4	.451	.50 ^M	.11 ^S	
	Peer	5	130.0(67.2)	146.4(67.7)	151.2(57.5)	1.88	4	.134	0.65	4	.550	.30 ^S	.08 ^S	
5	Dog	5	137.8(50.8)	163.8(48.3)	181.2(59.7)	3.28	4	.030	2.65	4	.121	.63 ^M	.34 ^S	
	Peer	6	94.2(36.9)	116.0(36.0)	133.5(45.8)	2.65	5	.046	1.72	5	.146	.53 ^M	.45 ^M	

Based on Cohen's criteria (Large Effect Size = .80, Medium Effect Size = .50, and Small Effect Size = .20), we used L—Large Effect Size .65 or larger, M—Medium Effect Size .35 to .64, and S—Small Effect Size .00 to .34.

*Alpha = .025 (Pre-Mid and Mid-Post t-tests were done using the same group)

Note. "Dog" represents the group that read to dogs during the first five weeks (Pre to Mid), and "Peer" represents the group that read to peers during the first five weeks (Pre to Mid). The groups switch during the second five weeks (Mid to Post).

the effect size for children who read to dogs. However, in Grades 2 and 5 the opposite was true, as would be expected if reading to dogs had a greater effect than reading to peers. The largest Effect Size difference between the Dog-First Group and the Peer-First Group was for Grade 2. All groups (Dog-First and Peer-First) individually showed increased Word per Minute averages for Pre to Mid and Mid to Post at all Grade Levels (See Table 1) though not all were statistically significant. Mid to Post increases were statistically significant only for both groups in Grade 2.

Between-Group Differences

Dog-first vs. peer-first differences. Examination of Pre-Mid Effect Sizes for the two groups within each Grade (2, 3, 4, and 5) showed that in three of the four grades (grades 2, 4, 5) the effect size for children who read to dogs was greater than the effect size for children who read to peers, as would be expected if reading to dogs had a greater effect than reading to peers. In Grade 3 the reverse was true. The Mid-Post Effect Sizes showed that the effect size for children who read to peers was greater than the effect size for children who read to dogs for Grades 3 and 4. However, it was smaller for Grades 2 and 5, as would be expected if reading to dogs had a greater effect than reading to peers. There were no statistically significant differences between Groups (Dog-First vs. Peer-First) for Pre, Mid, or Post scores at any Grade Level (2, 3, 4, and 5).

An analysis of the oral reading fluency percentage gains by group provides further evidence that reading to handler/dog teams had a greater effect on reading achievement than reading to peers. During the first five weeks, second-graders who read to dogs increased their oral reading fluency by 45 percent; second-graders who read to peers during the first five weeks increased their oral reading fluency by only 21 percent. During the first five weeks, fourth-graders who read to dogs increased their oral reading fluency by 22 percent; fourth-graders who read to peers during the first five weeks increased their oral reading fluency by only 12 percent.

During the second five weeks, second-graders who read to handlers/dogs increased their oral reading fluency by 22 percent; second-graders who read to peers during the second five weeks increased their oral reading fluency by only 14 percent. During the second five weeks, fifth-graders who read to dogs increased their oral reading fluency by 15 percent; fifth-graders who read to peers during the second five weeks increased their oral reading fluency by only 10 percent.

Discussion and Conclusions

Although some of our results did not reach the level of statistical significance (most likely due to the small samples sizes used in the study), we found a pattern that would suggest a “dog effect” when studying reading achievement, operationally defined for this study as oral reading fluency scores. Both the within- and between-group comparisons suggested a dog effect. Hence, the overall pattern that emerged suggested that reading with a handler/dog team was more beneficial to children than reading to peers. However, this effect seemed more prominent during the first five weeks than the second five weeks, which may indicate that the novelty of reading to dogs might have played a role.

Additionally, the dog effect seemed to be more prominent and consistent at grade 2 than at other grades, suggesting that such programs may be more effective in the early elementary grades (i.e., kindergarten, 1st, 2nd) rather than later grades (i.e., 3rd, 4th, 5th, 6th). There is growing evidence to suggest that the kindergarten and primary grades are an irreplaceable opportunity to develop reading skills (National Reading Panel, 2000). When low performance in reading occurs during the early grades, it tends to persist or even worsen over the remainder of the child’s formal education (Hernandez, 2012). Programs that use therapy dogs to increase reading skills should recognize that effects may be greater earlier in the program than later in the program and with children in earlier grades; therefore, further study of the effects of the duration of the program and age/grade of students on results is warranted. This was a short-term intervention and it remains to be seen whether positive effects on children’s oral reading proficiencies may have a ceiling or the situational interest created by the presence of the dogs wanes over time.

Although our study is one of a few to use a true experimental design to assess the effect of reading to therapy dogs on reading achievement and reading attitude, it has significant limitations; therefore, results should be interpreted with caution. The small, provincial sample limits generalizability beyond the participants and setting of the study. Many statistical comparisons were not statistically significant, possibly due to small sample sizes. Conversely, effect sizes and patterns were meaningful and suggestive of a dog effect, and these results clearly warrant additional research. Ideally, the comparison would have been made between children reading with an adult literacy tutor/dog team and an adult literacy tutor only; however, practical considerations in recruiting additional volunteers made this unfeasible. Nevertheless, it could be argued that the reading to a peer only was more typical of what happens in a classroom

in the absence of volunteers. In addition, this was a short-term intervention. Longitudinal research on such programs would be an important next step in the research.

We were somewhat surprised that there were no significant effects on children's attitudes toward reading, given that anecdotal reports and qualitative studies of reading assistance dog programs frequently report this outcome. This finding may be attributable to limitations of the ERAS as a psychometric tool or that the duration of the program was insufficient to change general attitudes toward reading. In particular, the ERAS—while in wide use—has been found to lack stability over time (Kazelskis et al., 2004), and this might have obscured any changes in attitude that might have occurred. Measuring young children's attitudes in general and toward reading specifically is particularly problematic because attitudes have not stabilized and are still being formed and changed. We used the ERAS to measure reading attitudes because it is one of a few published, standardized, norm-referenced instruments available to do so and some research has supported its validity. Future research should attempt to use different and varying measures of reading attitudes to better understand the nature of the relationship between reading to dogs and attitudes toward oral reading in particular or more general attitudes toward reading.

Our findings are consistent with trends in the research on effective reading interventions that rely on the services of volunteer tutors. The program that was implemented adhered to the basic principles of motivation to learn as well as the characteristics that make reading tutoring programs successful, namely (1) tutors were trained, enthusiastic, and supportive of children's efforts; (2) the dogs were used to build situational interest; (3) reading materials were matched to the children's skill levels through collaboration with teachers and administrators; (4) each child's choices, interests, and self-concept were carefully considered; and (5) every child participant had time to read with guided support. Although the program provided just 150 minutes of adult-supervised oral reading by elementary students, this still represents a large increase in the time allocated to this activity in the classroom. If the findings of other research are accurate and a typical child gets, at most, a few moments of individual, adult supervised oral reading and only about 12 minutes per day of "eyes on text" or Opportunity to Read (OtR) during school hours (Hiebert & Reutzel, 2010), then the children who participated in this study easily doubled that amount, regardless of whether they worked with a peer or with the handler/dog team.

Other strengths of the initiative are that it garnered nearly 100 percent of families' consent for their children to participate and that the program was

implemented, free of charge, to the school. Contemporary schools are faced with public outcry for higher scores on reading achievement tests, large numbers of children who struggle with reading, and severe budgetary constraints.

A new book on tutoring notes that, given the repeated failure and frustration experienced by children who struggle with reading, they frequently are unengaged or unmotivated to perform various literacy tasks (Fisher, Bates, & Gurvitz, 2014). Yet student engagement—defined as interest, concentration, and enjoyment—is the cornerstone of learning (Shernoff, 2013). Read/dog programs hold promise as a means of addressing this persistent problem and certainly warrant additional research.

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