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Valerie Daifotis

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DOGGONE SMART:
A CANINE-ASSISTED READING PROGRAM AND THE EFFECT ON SELF-EFFICACY AND STANDARDIZED TEST SCORES

by

VALERIE DAIFOTIS

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PROFESSOR ABDULLATIF
PROFESSOR CATALINO

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Abstract

The use of dogs in a reading program is not a new concept. However, this study addresses the gap in the literature by exploring the connection between reading to dogs, reading self-efficacy, and reading standardized test scores. Using an experimental control-group design, this study will look at below-average readers in the fifth grade with half randomly assigned to read once a week to a certified therapy dog and volunteer and the other half randomly assigned to read to just an adult volunteer with no dog. This study will use a reading self-efficacy questionnaire (Carroll & Fox, 2017) and the existing reading standardized test used in the school district. The study should find that reading to dogs has a significant effect on reading self-efficacy and reading standardized test scores. Self-efficacy should mediate the effect of the presence of dogs in the reading group on test scores. This study will contribute to the existing literature on canine-assisted reading programs as well as academic self-efficacy. Though the results are based on local fifth grade students, the study can be replicated in other grades and school districts.

Introduction

Literacy is a powerful form of currency in American society. Without it, or with limited competency, quality of life is much lower due to poverty, fewer employment opportunities, lower wages, and overall less involvement in society (US Department of Education, 2002). In 2015, over thirty percent of fourth graders were reading at a below basic level, which means they were not "able to locate relevant information, make simple inferences, and use their understanding of the text to identify details that support a given interpretation or conclusion" (National Center for Education Statistics, 2015). With that being said, there is a similarly powerful behavioral concept that can mitigate this issue—academic self-efficacy, or one's own belief that they can succeed academically. The study of academic self-efficacy as a whole is valuable to society at large and to teachers within the classroom directly educating children. Self-efficacy is a good predictor of students' academic motivation, achievement, and future academic choices (Pajares, 2003); and, the resulting benefit of academic achievement is a good indicator of future success in one's career (Kell, Lubinski, & Benbow, 2013). Therefore, self-efficacy, specifically reading self-efficacy, can have a direct impact on the nearly one-third of elementary school students who are below basic reading level. By incorporating both Bandura's (1977) concept of self-efficacy as it applies to elementary readers and the more recent interest of having struggling students read to dogs, this study will propose a reading intervention program that can be executed in a public elementary school setting.

The positive effects of dogs on people (that are not afraid of or allergic to them) is nearly indisputable in popular culture. To support this claim there is a vast amount of research on the effect dogs have on children. Dogs have been shown to positively impact

children academically (Jalongo, Astorino, & Bomboy, 2004; Sorin, Brooks, & Lloyd, 2015; Fujisawa, Kumasaka, Masu, & Kataoka, 2016), physically (Wohlfarth, Mutschler, Beetz, Kreuser, & Korsten-Reck, 2013), socially and behaviorally (Hergovich, Monshi, Semmler, & Zieglmayer, 2002; Kotrschal & Ortbauer, 2003), and emotionally (Prothmann, Bienert, & Ettrich, 2006; Kertes, Liu, Hall, Hadad, Wynne, & Bhatt, 2017).

Self-Efficacy

Self-efficacy, "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 2), affects one's thoughts, feelings, and actions. Extensive research has been conducted on its application to children and the academic domain since Bandura (1977) first proposed this construct. Self-efficacy in the academic domain is important because children's beliefs about their mastery of academic subjects affects both their level of motivation and academic achievement (Pastorelli, Caprara, Barbaranelli, Rola, Rozsa, & Bandura, 2001). And, in a self-fulfilling-prophetic manner, children that have higher academic achievement tend to have higher levels of academic self-efficacy, such that students who are successful academically will have higher self-efficacy and students that have higher self-efficacy are more likely to be successful academically. This is a result of the most influential source of self-efficacy, "the interpreted result of one's performance, or mastery experience," (Pajares, 2003, p. 140). Similarly, low self-efficacy hinders academic achievement, which again creates a self-fulfilling prophecy of failure and learned helplessness (the students' beliefs that there is no relationship between their behavior and an outcome), such that no matter how hard they try, they cannot learn (Margolis & McCabe, 2006 and Linnenbrink & Pintrich, 2003).

Bandura (1994) provides four main sources of influence that affect people's beliefs about their efficacy—success in a task (mastery experiences), social models, social

persuasion, and emotional state. Mastery experience is the interpreted result of one's performance as either success or failure, with successes building one's self-efficacy, and failures diminishing it, "especially if failures occur before a sense of efficacy is firmly established," (Bandura, 1994) as in elementary-school-aged children. Next, the concept of social models provides students with the vicarious experience of seeing another person succeed by putting sustained effort into a task, and thus believing that they can also master similar tasks. However, the influence of the social model on one's self-efficacy increases as the perceived similarity between the student and the model increases (Bandura, 1994). And, social models not only give students a standard by which to judge themselves, but also transmit their own knowledge and essentially teach the observer (Bandura, 1994 and Margolis & McCabe, 2006). A third source of influence on one's self-efficacy is verbal and social persuasion, which comes in the form of positive messages from others. However, it is difficult to use verbal and social persuasion alone to increase someone's belief in their ability, as unrealistic verbal boosts coupled with disappointing results in a task undermine the attempt to increase self-efficacy. Thus, verbal and social persuasions are best coupled with placement in situations where one is likely to succeed (Bandura, 1994). Somatic and emotional states before, during, or after engaging in a task provide individuals with insight into their efficacy. A positive mood can increase perceived self-efficacy, while a negative mood or somatic stress-related symptoms can decrease self-efficacy. For example, a student that feels relaxed and happy while reading aloud will have higher self-efficacy than a student who is queasy or anxious while reading aloud.

Because self-efficacy is critical to students' academic success, it is important to consider how educators can increase it, especially during elementary school where the foundation is laid for future academic and life skills. In particular, self-efficacy about reading

is the focus within this study. The U.S. Department of Education (2003) claimed that "reading opens the door to learning about math, history, science, literature, geography and much more. Thus, young capable readers can succeed in these subjects, take advantage of other opportunities, and develop confidence in their own abilities." This directly applies to reading self-efficacy, such that the higher the sense of self-efficacy, the greater the effort, persistence, and resilience of the student (Pajares, 1996). Self-efficacy beliefs also mediate the effect of skills or other self-beliefs on future tasks by affecting effort, persistence, and perseverance (Pajares, 1996). Essentially, literacy is the foundation for all future learning and self-efficacy is the means by which students can achieve it. And, unless students believe they can do something (such as reading successfully), they will have little incentive to actually try, which sets them up for a downward academic spiral (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996).

Chances for increasing self-efficacy come from providing students with the opportunity to have mastery experiences, facilitating social models, utilizing verbal persuasion, and by ensuring a positive mood before, during, and after attempted tasks. When it comes to reading self-efficacy, having mastery experiences does not mean reading overly simplified texts that are well below the ability level of the student. Researchers have found that struggling through a challenging text that is slightly above their current reading level successfully is more beneficial to increasing self-efficacy than reading a text that is too easy (Linenbrink & Pintrich, 2003 and Pressley, Dolezal, Raphael, Mohan, Roehrig, & Bogner, 2003). This is closely related to Vygotsky's (1978) Zone of Proximal Development, in which the learning of a task above one's individual skill level is done through collaboration (in this case, reading with someone) (Shabani, Khatib, & Ebadi, 2010). Similarly, the concept of social models aligns with Vygotsky's (1978) Zone of Proximal Development. However, in

this case, instead of utilizing a social model simply for learning a task above one's skill level, the model also serves as a vicarious experience, in which one's own self-efficacy can increase by watching the success of a similarly-leveled individual. When a student sees a peer who is at a similar reading level to their own struggling through a difficult text successfully, their own reading self-efficacy will increase. Next, verbal and social persuasion in the context of reading self-efficacy comes in the form of supportive feedback while reading (Unrau, Rueda, Son, Polanin, Lundeen, & Muraszewski, 2018). In order to capitalize on this method, assurances of success need to be met by actual successes in the task, or else the credibility of the message decreases as well as the credibility of whoever is giving it (e.g. the teacher) (Margolis & McCabe, 2006 and Unrau, Rueda, Son, Polanin, Lundeen, & Muraszewski, 2018). Finally, physiological and somatic experiences in the context of increasing reading self-efficacy include ensuring the student is relaxed, unintimidated, and in an overall positive mood before they are asked to read. A student that is nervous, queasy, upset, or feels they are in a competition will have negative associations with reading, which will reduce their reading self-efficacy (Bandura, 1994; Pressley, Dolezal, Raphael, Mohan, Roehrig, & Bogner, 2003; Margolis & McCabe, 2006). Therefore, in order to increase reading self-efficacy, teachers should seek to reduce the stressors and the stress reactions associated with reading in school and help cultivate a positive mood, which enhances self-efficacy (Bandura, 1994). Focusing on three of these four sources of self-efficacy—the opportunity to have mastery experiences, utilizing verbal persuasion, and ensuring a positive mood before, during, and after attempted task will help guide the proposed study.

Canine-Assisted Reading Programs

Canine-assisted reading programs have become increasingly popular in the last decade, but the first well-known program involving reading to dogs was started back in 1999

by Intermountain Therapy Animals, who established Reading Education Assistance Dogs (READ) (Hall, Gee, & Mills, 2016). Since then, the mainstream popularity of reading to dogs has skyrocketed causing other programs to develop all over the world (Hall et al., 2016). Hall et al. (2016) conducted a systematic review of the literature surrounding canine-assisted reading programs and found the majority of the 48 studies they looked at to be a Level 5 on the hierarchy of evidence used by the Oxford Centre for Evidence Based Medicine (OCEBM), which means within the literature there were encouraging findings that supported canine-assisted reading programs, but no control measures were used. Of the remaining studies that the researchers reviewed, very few were methodologically strong. However, all of the 48 studies described positive outcomes from children reading to dogs.

Thus far, canine-assisted reading programs have been investigated with a variety of populations and with a variety of dependent variables. Bassette and Taber-Doughty (2013) conducted a study on three students with emotional and behavioral disabilities. The researchers observed the three participants reading to dogs and recorded their on-task reading behavior (eyes on the book and reading loud enough for the observer to easily hear the words). The results of the study showed moderate to significant improvements in on-task reading behavior for all three of the students. Kirnan, Siminerio, and Wong (2016) analyzed an existing school program that had integrated therapy dogs into the reading curriculum. The researchers analyzed standardized reading test scores of 169 students in kindergarten through 4th grade at a suburban New Jersey elementary school and found that only in kindergarten was there a significant difference between the year-end scores of the students in the dog reading group and the year-end scores of the control group. Kirnan, Ventresco, and Gardner (2017) conducted a follow-up study to assess the second year of the program and extended it to English language learner (ELL) students. In the follow-up study, Kirnan et al. (2017)

found that there was a significant difference in reading scores between dog and control group for kindergarten again, but also for first grade. Lenihan, McCobb, Diurba, Linder, and Freeman (2016) conducted a study on second graders during the summer and found that attitude towards reading dropped in the group not reading to dogs, while the attitude towards reading of the group reading to dogs remained the same. le Roux, Swartz, and Swart (2014) conducted their study with low SES third graders and found that the dog reading group read at a higher reading comprehension level than the other two groups (one group reading to adults and one group reading to teddy bears) at the end of the 10-week program. The effects of dog reading programs have also been looked at with private school students in grades two through five, public second grade students of average reading level, and upper middle-class German second grade students (Levinson, Vogt, Barker, Jalongo, & Van Zandt, 2017; Linder, Mueller, Gibbs, Alper, & Freeman, 2018; Wohlfarth, Mutschler, Beetz, & Schleider, 2014).

Overall, the research suggests canine-assisted reading programs are more than just a catchy gimmick. However, there is a weak spot in the literature regarding the methodology of the existing studies. Therefore, the proposed study will add to the literature and will implement a randomized control group. Additionally, the proposed study will focus on a dependent variable that has not yet been looked at within this area—reading self-efficacy.

Within this study, the use of a canine in the reading group aims to address the somatic and emotional states that affect self-efficacy. The American Veterinary Medical Association (2014) "officially recognized, in 1982, that the human animal bond was important to client and community health". Since then, dogs have been used in many programs aimed at benefiting community health and wellness. A canine-assisted reading program, as proposed in this study, falls somewhere between their definition of animal-assisted activity (AAA):

> which provide opportunities for motivation, education, or recreation to enhance quality of life. Animal assisted activities are delivered in a variety of environments by specially trained professionals, paraprofessionals, or volunteers in association with animals that meet specific criteria. (American Veterinary Medical Association, 2014)

and animal-assisted therapy (AAT), which is:

> a goal directed intervention in which an animal meeting specific criteria is an integral part of the treatment process. Animal-assisted therapy is delivered and/or directed by health or human service providers working within the scope of their profession. Animal-assisted therapy is designed to promote improvement in human physical, social, emotional, or cognitive function. Animal-assisted therapy is provided in a variety of settings, and may be group or individual in nature. The process is documented and evaluated. (American Veterinary Medical Association, 2014)

While the canine-assisted reading program is not goal-directed in nature, nor does it utilize health service providers, it aims to "promote improvement in human physical, social, emotional, or cognitive function" (American Veterinary Medical Association, 2014). Levinson (1984) proposed that animals, specifically those that are familiar and soft, can alleviate the initial shock of being in therapy as well as evoke secure and euphoric feelings. While this study is not proposing a reading therapy program, the same benefits of utilizing a dog in the reading group should be expected. Kertes et al. (2017) found that when faced with a novel stressor (in the proposed study, a new reading group may be perceived as a novel stressor), the presence of pet dog buffered the perceived stress of the situation. Therefore, the inclusion of dogs in the experimental group should have beneficial effects on the somatic and emotional states of participants—one of the four sources of self-efficacy.

The Current Study

The proposed study will utilize a convenience sample of fifth grade students from a local school district that have been identified as below-average readers based on standardized test scores and randomly assign them to either the experimental or control group. Prior to beginning the study, both the experimental and control groups will complete a reading self-efficacy questionnaire (Carroll & Fox, 2017). Participants in the experimental group will go once a week for thirty minutes to a canine-assisted reading group that includes one registered therapy dog and one handler/reading volunteer—the combination of which will target three of the four sources of influence for self-efficacy (mastery experiences, social persuasion, and emotional state). The control group will go once a week for thirty minutes to a reading group that includes one reading volunteer, but no registered therapy dog. At the end of the 10-week program, the participants will fill out the reading self-efficacy questionnaire again. Upon completion, the participants, along with a parent or guardian, will be debriefed. Based on the existing research about dogs in academic settings and the research on self-efficacy, it is hypothesized that the experimental group will have significantly higher reading self-efficacy and reading standardized test scores at the end of the 10-week program than the control group who does not have a canine in their reading group, controlling for baseline reading self-efficacy scores and reading standardized test scores. It is also hypothesized that the reading self-efficacy will mediate the effect of dogs on standardized test scores.

Method

Participants

Based on a conducted power analysis, there should be at least 128 participants, with the aim of at least 30 in each cell. The participants will be all fifth graders from a local school

district that have been identified as below-average readers based on their standardized test scores. An equal number of male and female students should participate. They will likely be 34% White, 43% Hispanic or Latino, 10% Asian, 6% two or more races, and 6% Black and Filipino (Education Data Partnership, 2017). Participant will be recruited through flyers sent home to parents or guardians who will give consent for their children to participate. An informational meeting will also be held at the school to answer any preliminary questions the parents or children may have about the study before agreeing to participate. Parents or guardians will give written consent allowing their child to participate and the participants themselves will provide written and verbal assent that they wish to participate. Participants will be compensated with a Scholastic coupon for one free book.

Materials

Reading Self-Efficacy Questionnaire. A 19-item reading self-efficacy self-report questionnaire (Carroll & Fox, 2017) will be used to assess students reading self-efficacy before and after the 10-week program. The questionnaire asks participants to rate their certainty that they can complete reading-related tasks on a scale of 1 to 7 with 1 being "very certain I cannot do" and 7 being "very certain I can do". It begins with three practice questions to check that participants understand the scale. Certain items will be reverse scored, and the overall score will be a mean rating from 1 to 7. The questionnaire has good internal reliability ($\alpha = 0.912$) and the inter-item correlation coefficients for the items are all positive (0.38 to 0.78). It was pilot tested on 30 children between 8 and 10 years old and adjusted to ensure complete understanding of the language used in each item.

Reading Skill. A district-wide reading standardized test will be used as a pre-screening measure to initially find the below-average readers who will be asked to participate

in the study. The test will also serve as a post-test to assess reading skill level at the end of the 10-week program. The test is completed on classroom iPads in less than 20 minutes and assesses state reading standards encompassed in literature, informational text, and language. It is a computer-adapted test that continually adjusts the level of question given based on whether or not the previous question was answered correctly or incorrectly. The score will be scaled based on the difficulty of the questions and number of correct answers given with the overall score being a mean rating between 0-1400.

Reading Program. The therapy dogs used in the experimental group will be from a local animal-assisted therapy organization that specializes in placing registered therapy dogs in various academic and social programs. The dogs will be accompanied by a trained volunteer handler that has worked with children before in academic settings. The same volunteer handlers will serve as the reading volunteers for the control group, but without the presence of the dogs. Volunteers will be instructed to provide positive verbal feedback to the participants in equal quantities to the experimental and control groups, which will act as the verbal social persuasion—one of the four main sources of self-efficacy (Bandura, 1994). Both the experimental and control group will read books selected by the participants based on interest but will be approved by their teachers for being appropriately challenging for each individual, which should facilitate a mastery experience (another one of the four sources of self-efficacy (Bandura, 1994)) without being too easy for the participant (Linenbrink & Pintrich, 2003; Pressley et al., 2003).

Procedure

Permission for this study will be obtained at the district, school, and classroom level. Flyers will be sent home to parents of the students identified through routine standardized

testing as being at below-average reading level and will provide the initial information on the study. An informational meeting will be held to answer any preliminary questions that students or parents may have before agreeing to participate. After receiving written consent from parents of the participants, students will give their own written and verbal assent to participate. Participants will first fill out a reading self-efficacy questionnaire (Carroll & Fox, 2017). Then, participants will be randomly assigned to either experimental or control group. Participants in the experimental group will go once a week for thirty minutes to a canine-assisted reading group that includes one registered therapy dog and one handler/reading volunteer—the combination of which will target three of the four sources of influence for self-efficacy (mastery experiences, social persuasion, and emotional state). The control group will go once a week for thirty minutes to a reading group that includes just a reading volunteer. At the end of the 10-week program, participants will again fill out the reading self-efficacy questionnaire and take the standardized reading test utilized by the school to assess reading skill level. After concluding the program, students and parents will be debriefed together and have the opportunity to ask any remaining questions about the program and study.

Ethics

The proposed study is beneficial to the participants and the knowledge base surrounding canine-assisted reading programs and reading self-efficacy. The participants of the study will benefit by attending a small reading group, either canine-assisted or not, depending on which group they are assigned to, which should help their reading skills, comprehension, and self-efficacy. This study will contribute to the knowledge of canine-assisted reading programs and reading self-efficacy by determining whether the presence of a dog in the reading group will cause a greater increase in reading self-efficacy, which should

cause an increase in reading skills (assessed based on standardized test scores). The benefits of this study greatly outweigh the risks to participate in this study because there is minimal risk to participate. Participants will be interacting with certified therapy dogs that are highly trained. There is an extremely low chance that the dogs will be violent or aggressive towards participants as they are screened for temperament and behavior in order to become certified. Therefore, no part of this study will present more risk than is found in daily life where a person may encounter their own pet or a dog walking down the street. The proposed study will also not involve any sensitive information or deception.

However, the proposed study does involve a protected population—children under the age of 18. It is necessary to use this population, as the population of interest is fifth grade students. Running the study on participants over the age of 18 will not lead to results that are generalizable to fifth graders because so much growth occurs mentally, physically, emotionally, and academically between 10- and 11-year-olds and those over 18 years of age. To protect this vulnerable population, written consent from the parent or guardian for their child to participate in the study will be received and written and verbal assent from the participants themselves will also be received. Prior to agreeing to participate, the basic purpose of the study will be provided to both the parents and children, so they know that there is the possibility that participants will be reading in close proximity to a dog. Parents will be warned not to consent if their child has any past negative experiences with dogs, known phobias towards dogs, or allergies to dogs. Resources for local counseling services will be provided in the event that the study invokes a negative reaction from a participant. Additionally, all of the information and questionnaires presented are age-appropriately worded to ensure participants understand what is being asked of them. Participation in this study is completely voluntary. Both parent or guardian and child will receive no special

treatment from the students' teachers or school for agreeing to participate and no negative consequences will result for those that decline. Additionally, it will be made clear that at any time if the parent or guardian no longer wants their child to participate, they may leave the study without any repercussions and will still receive compensation for their time. The same will hold true if the participant no longer wishes to participate. Finally, the data collected will be confidential to protect the privacy of the participants. The reason for opting to choose confidential over anonymous provides the ability to share results with participants' teachers to positively utilize the data post-experiment. To ensure complete confidentiality, participants' paper data will be stored in a locked file cabinet within a locked room and once it is converted to electronic data it will be stored on a password-protected laptop.

Predicted Results

It is hypothesized that the experimental group will have significantly higher reading self-efficacy and reading standardized test scores at the end of the 10-week program than the control group who does not have a canine in their reading group. It is also hypothesized that the reading self-efficacy will mediate the effect of canines on standardized test scores. These results are expected based on research regarding dogs in academic settings and the positive effect they have on students (Hall, Gee, & Mills, 2016). Research suggests that dogs can positively affect emotional state, which is one of the four sources of self-efficacy (Levinson, 1984; Kertes et al., 2017). Additionally, the research conducted on self-efficacy (Bandura, 1977; Bandura, 1994; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) as well as Pajares' (1996) academic domain-specific self-efficacy research suggest that greater self-efficacy leads to greater academic achievement.

First, proper outlier analyses will be done to the data. Then, to test hypothesis one, an ANCOVA will be conducted to test the relationship between dog or no dog and reading self-efficacy at time two (end of 10-week program), controlling for reading self-efficacy at time one. It is predicted that the experimental group, those who had a dog in their reading group, will have significantly higher reading self-efficacy at the end of the 10-week program, controlling for reading self-efficacy at time one. To test the second hypothesis, an ANCOVA will be conducted to test the relationship between dog or no dog and reading standardized test scores at time two (end of the 10-week program). It is predicted that the experimental group, those who had a dog in their reading group, will have significantly higher reading standardized test scores at the end of the 10-week program, controlling for test scores at time one.

Next, to prove that reading self-efficacy mediates the effect of dogs on test scores, three steps must be followed based on Baron and Kenny's (1986) procedure. First, as noted above, dogs must be shown to predict the test scores. Second, also noted above, dogs must be shown to predict reading self-efficacy. Additionally, self-efficacy must also be shown to predict test scores. To test this, a simple correlation will be run to test the relationship between reading self-efficacy and standardized test scores. It is predicted that the higher the reading self-efficacy, the higher the standardized test scores will be. This is predicted based on Bandura's research on self-efficacy (Bandura, 1977; Bandura, 1994; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) as well as Pajares' (1996) extension of the research into academic settings that suggest higher academic self-efficacy leads to higher academic achievement.

Finally, the third step in Baron and Kenny's model involves proving that test scores are predicted by the presence of dogs and reading self-efficacy. This will be shown by

conducting an ANCOVA to test the relationship between presence of dogs and reading self-efficacy on the standardized test scores. It is predicted that the presence of dogs and reading self-efficacy will have a significant effect on standardized test scores. By proving these three steps, reading self-efficacy is shown to mediate the effect of dog in reading group on standardized test scores.

Conclusion

Reading is the foundation for not only academics, but also almost everything else in our society. From reading and understanding contracts to tax forms to medical paperwork, the ability to function successfully in our society is largely dependent on one's reading ability. If a child does not have adequate reading skills and progresses through the education system without addressing the issue, they are set up for a lifetime of struggling. This study proposes a canine-assisted reading program that can help struggling readers in elementary school by utilizing dogs to increase reading self-efficacy, which should also improve individuals' reading ability as demonstrated by their reading standardized test scores. This study focuses on all of the struggling readers in fifth grade in one district in southern California. Based on existing self-efficacy research (Bandura, 1977; Bandura, 1994; Bandura et al., 1996; Pajares, 1996) and research regarding dogs in academic settings (Fujisawa et al., 2016; Jalongo et al., 2004; Sorin et al., 2015) and specifically canine-assisted reading programs (Bassette & Taber-Doughty, 2013; Kirnan et al., 2016; Kirnan et al., 2017; Lenihan et al., 2016; Levinson et al., 2017; Linder et al., 2018; Wohlfarth et al., 2014), students who were in the experimental group should have greater reading self-efficacy after the 10-week program, which should also increase their reading level (as indicated by their reading standardized test scores).

Though it builds off of existing literature and addresses various gaps in this domain, this study has its own set of limitations. The main issue involves using standardized test scores as a means of judging reading ability. This method was chosen based on the familiarity for students in the district, as the tests are given every year, multiple times a year, which should provide some sense of comfort versus introducing an entirely new measure to test the students' reading abilities. Additionally, the mere fact that it is a test is also a limitation. Despite using a test that students should be familiar with, not all students are comfortable taking tests, which could affect their results in a way that does not accurately reflect their reading ability. Another limitation of this study is in the location of the actual reading group. The struggling readers are removed from their classroom for thirty minutes per week, which may cause them to feel self-conscious that they are missing class or "targeted" for being a below-average reader.

Future directions that would expand upon the results from this study as well as address this study's limitations could involve replicating with other populations such as a different grade level or demographic. The present study utilizes participants from a suburban southern California public school district. However, it would be beneficial to repeat this study in a high-need, urban district to see if the effects would be greater. Utilizing a sample from another district could also shed light on how bilingualism, SES, and parental involvement at home affect reading self-efficacy. The study method could also be altered to accommodate the reading groups within the classroom or even for thirty minutes after school to alleviate some of the shortcomings from pulling students from their classroom during the day. Despite these limitations, this study provides beneficial findings for educators, researchers, and the general population as it has been mentioned previously that reading is a universal issue.

The results from this study can be used to guide classroom practices, future intervention programs, and professional development for teachers. Though this study is reliant on dogs as the means of increasing reading self-efficacy, it should also demonstrate the power of self-efficacy as a mediating variable on reading skill level. With that information, teachers can focus on improving reading self-efficacy in other ways, should they not have access or funds for incorporating dogs into their reading curriculum. However, the results from this study could help spread awareness about the benefits of including dogs in academic settings, as well as the specific benefits of canine-assisted reading programs.

Whether we like it or not, reading is important. Unfortunately, not all children progress through our education system at the same reading level. This study utilizes dogs—a time-tested solution (Hall et al., 2016)—to help below-average readers increase their self-efficacy and their reading ability and to guide further research in this area.

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Appendix

Reading self-efficacy questionnaire (Carroll & Fox, 2017)

Practice

Read each item and rate how certain YOU are that you can do the actions described below by circling one of the numbers below the item. High scores equal a higher certainty that you can do the action. Please wait for instructions before starting the practice items.

Lift a bag of sugar

Very certain I cannot do- 1 2 3 4 5 6 7 - Very certain I can do

Lift one of my class friends

Very certain I cannot do- 1 2 3 4 5 6 7 - Very certain I can do

Lift two of my class friends

Very certain I cannot do- 1 2 3 4 5 6 7 - Very certain I can do

Main questionnaire

Read each sentence and rate how certain **YOU** are that you can do the things described below. It is important you tell us what **YOU** think about your reading. When you think about reading, think about the any reading that you do at school and at home. These could be things you read in books, magazines, newspapers, comics, emails, text messages and the internet. To give an answer circle one of the numbers on the scale below the item.

Very certain I cannot do - 1 2 3 4 5 6 7 - Very certain I can do

1. Read out loud in front of the class
2. Continue reading even when I find it difficult
3. Work out the sounds in words I have not seen before

4. Sound out a word that I find hard to read
5. Read on my own without an adult's help
6. Read things that are harder than the book I normally read at school
7. Know what I can do to improve my reading
8. Continue reading even when I find the subject boring
9. Read out loud quickly and still get words right
10. Make out words easily when I read
11. Improve my reading if I really want to
12. Continue reading even when I do not like the subject
13. Read as well as my friends
14. Continue reading even when I get frustrated
15. Practice reading in my spare time even when I don't have to
16. Read without making lots of mistakes
17. Read difficult books
18. Read a book I have not read before
19. Work out the sounds in words I have not seen before