

TURNING THE PAGE FOR SPOT

Turning the Page for Spot: Exploring the Potential of Therapy Dogs to Support Reading  
Motivation and Positive Reading Behaviours Among Young Children

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Abstract

Animal-assisted literacy programs are growing in popularity as research continues to reveal their benefits for promoting children's reading skills and positive reading behaviours. Struggling readers may benefit the most from canine-assisted literacy programs as these programs may increase children's motivation to read, which in turn might be associated with improvements in children's reading performance. However, little is known about how the context of canine-assisted literacy programs can help increase children's motivation and persistence to read. The purpose of this proof of concept study was to assess the feasibility of engaging children with therapy dogs to help increase children's reading motivation and persistence. We collected observational and self-report data from several sources (child participants, parents and researchers). Results of multivariate repeated-measures ANOVA with two levels (i.e. two-factor repeated measures design) revealed significant differences in reading motivation and reading persistence as a function of the presence or absence of a therapy dog when children were asked to read a challenging passage. Specifically, the children reported that they were more interested in reading and felt more competent reading a challenging passage when reading in the presence (versus absence) of a therapy dog. Additionally, the children individually spent more time reading in the presence (versus absence) of the therapy dog. The findings from this research will inform the development of animal-assisted literacy programs regarding the potential of canine-assisted reading programs to support children's reading motivation and persistence.

*Keywords:* canine-assisted reading, animal-assisted activity, therapy dogs, reading motivation

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## **Introduction**

### **Animal-Assisted Interventions**

Over the past twenty years we have witnessed a rise in the number of Animal-Assisted Interventions (AAI) to promote young people's socio-emotional health and academic development (Binfet & Passmore, 2016; Friesen, 2010; O'Haire, 2010). These interventions are typically classified into two categories: Animal-Assisted Therapies (AAT) and Animal-Assisted-Activities (AAA; Kirnan, Siminerio, & Wong, 2016). The specific distinctions between AAT and AAA are often debated, but usually, AAT sessions are intensive and structured with the client being guided through the intervention by a trained professional (Kirnan et al., 2016; Kirnan, Ventresco, & Gardner, 2017). Clients are required to perform certain tasks or exercises to attain specific and individualized goals. On the other hand, the goals of AAA are typically more general and more lenient such as improving well-being and providing companionship, and the services are provided by professionals or volunteers (Kirnan et al., 2016, 2017).

### **Therapy Dogs**

Often AAT and AAA engage a diversity of animals including companion animals such as dogs, cats, and guinea pigs, and sometimes more exotic animals such as horses, birds, and dolphins. However, most often the type of animal that is engaged in these interventions is a therapy dog; in fact, this is most often the case in educational settings (Johnson, Odendaal, & Meadows, 2002; Morrison, 2007). Therapy dogs usually form a team with their owner, also referred to as the handler, and both take part in various AAI settings. It is the owner's responsibility to train his or her dog to meet the certification requirements of a therapy dog (St. John Ambulance, n.d.; Pacific Animal Therapy

Society, n.d.). Therapy dogs cannot access all public spaces in the same way that service dogs can because they are not protected by the Accessibility for Ontarians with Disabilities Act from the Statutes of Ontario (2005). While there is no legal definition of what constitutes a service dog, it is commonly understood that service dogs differ from therapy dogs precisely because they are trained to assist an individual with a disability without the recourse of a handler (e.g., guide dogs for people who are blind or with severe vision loss). On the other hand, therapy dogs can support various individuals with or without disabilities in partnership with a handler. Nonetheless, therapy dogs and their handlers must meet the specific requirements to provide services to the public. Depending on the organization with which they are involved, this can entail performing specific tasks beyond what is taught in basic obedience training and can also require dogs to have a certain temperament. For example, therapy dogs can be required to possess the following characteristics: be accepting of friendly strangers, allow themselves to be petted by strangers, react well to distractions, stay in place for extended periods of time, and walk on a loose leash through crowds (St. John Ambulance, n.d.). Temperament standards can include but are not limited to dogs being friendly, gentle and patient in all contexts in which they work (Ottawa Therapy Dogs, n.d.).

In the Niagara region, St. John Ambulance provided certification for therapy dogs and therapy dog volunteers (St. John Ambulance, n.d.). These volunteers can contribute their services in many and varied contexts, including nursing homes, hospitals and schools. Similar to the approach of many organisations across Canada, the St. John Ambulance Dog Therapy Program is organized and run by volunteers and the purpose of their interventions is more general, with the services they provide falling more closely



under the umbrella of AAA. The St. John Ambulance therapy dog program, including the one in the Niagara Region, represents a typical model of the therapy dog programs run across Canada.

### **Animal-Assisted Education (AAE)**

Recently, the American Medical Veterinary Foundation (2017) added a new type of AAI in addition to AAT and AAA: Animal-Assisted Education (AAE). These interventions are planned, structured and have academic or educational goals implemented by educational professionals or professionals of related services (e.g. educational assistants). AAE services fall somewhere between those that are provided by AAT and AAA as they share similarities with both types of interventions. As such, Kirnan et al. (2017) suggest that all AAIs should be considered as falling along a spectrum rather than falling under two mutually exclusive categories (i.e., as either AAT or AAA). Canine-assisted literacy programs mainly fall under the AAE type of AAI but they differ greatly in terms of structure, setting and purpose.

### **Animal-Assisted Literacy Programs**

There has been increased popularity in animal-assisted literacy programs in various educational settings such as classrooms, after-school programs, and libraries. The first formal program was the *Reading Education Assistance Dogs (R.E.A.D.) program* established in 1999 by *Intermountain Therapy Animals*. The goal of this program was and remains to “improve the literacy skills of children through the assistance of registered therapy teams as literacy mentors” (Intermountain Therapy Animals, n.d.). As popularity of the program increased, other programs were implemented in various contexts like schools and libraries. In Canada, there are programs across the country provided by

organisations such as Pacific Animal Therapy Society (P.A.T.S.) in Victoria B.C., Pet Therapy Society of Northern Alberta, Zoothérapie Québec, and St. John Ambulance.

In the Niagara Region specifically, St. John Ambulance's *Paws 4 Stories* Dog Therapy Program is implemented in six schools of the District School Board of Niagara (L. Thwaites, personal communication, March 8, 2017). While the program differs slightly from school to school depending on the preferences of the principal, most schools are visited once per week. Children whose parents consent to participate in the program meet and read to the therapy dogs once per week from October to the first week of December, and from January to April (L. Thwaites, personal communication, March 8, 2017). The purpose of these programs is to help children improve self-esteem and gain confidence with the goal of improving their reading skills (St. John Ambulance, n.d.). The goals of these latter programs are aligned with theories on human-animal interactions, which highlight how non-humans, specifically companion animals, can support children's socio-emotional and educational development. For example, human-animal interaction scholars theorize that the human-companion animal bond can affect individuals' perceptual, cognitive, social, and emotional development (Melson, 2003; Mueller, 2014).

## Literature Review

### Theoretical Framework

Conceptually, this proof of concept study is guided by several interrelated lines of thinking. To begin, this study is guided by the application of the relational developmental systems approach to understanding the context of human-animal interactions (HAI). The relational-developmental systems approach, put forward by Overton (2013), suggests that development arises from a complex and multidirectional network of influences that are all part of the ecological system of the individual. The bidirectional interactions between the individual and the multiple levels of his or her ecology all contribute to the context that explains one's developmental trajectory in life.

More recently, application of the relational developmental approach has been proposed by Mueller (2014) to include the context of HAI. In this case, relationships between children and the multiple levels of their ecology can impact changes in the developmental trajectory of the former. As part of children's ecology, companion animals (CAs) are often part of children's developmental context. In one survey, up to 70% of all American households with children younger than age six and 78% of all households with children older than age six included pets or CAs (Melson, 2003). As such, a human-animal dyad produces a bidirectional relationship in which there is fluidity of change and reciprocal feedback in both beings. CAs can provide children the opportunity to foster positive developmental growth through behaviour and emotional commitment to a non-judgemental companion. Therefore, by their presence and their interactions, CAs can provide children with safe opportunities that foster development, and hence influence their developmental trajectory. CAs are often overlooked as constituting an important

part of the context of educational development; however, in this study on the contribution of canines, it is therapy dogs specifically that are the center of our attention.

Second, this study is guided by Levinson's (1987) clinically-informed perspective about the beneficial impact that petting an animal can have on a child. The animal becomes an alternative focus of attention for the child, and this can create a perceived experience of acceptance and trust in the child as the animal accepts the physical contact. Levinson hypothesized that this latter perception of acceptance on the part of the child is not only encouraged by something that the animal inherently offers but can also be explained in terms of the associated novelty or change in the environment that results from the animal's presence. For example, as the ambiance changes to an environment of warmth and acceptance, the child is encouraged and presumably more inclined to take risks. In the reading context, according to Cambourne (1988) it is necessary for children to take reading risks to promote literacy learning.

While some researchers have been attentive to the benefits of physical contact with the therapy animal during a reading task (Friesen & Delisle, 2012; Levinson, 1987), few have made the distinction between the benefits of the mere presence of an animal and direct physical contact with an animal (Kirnan et al., 2016). In the reading context, it is unclear whether physical contact is required to promote reading motivation and persistence. For example, when a child is simply reading to a dog, he/she might perceive any type of external attention accorded to the dyad as actually being directed toward the animal and not at him or her. This latter context might allow the child to feel more comfortable and less self-conscious when reading in the presence of a dog, even when there is no direct physical contact. Moreover, a dog might provide a non-judgmental

environment in which the child can work through the challenges associated with reading at his or her own pace (Hall, Gee, & Mills, 2016), thus providing a positive reading experience that might serve to annul any pervious negative experiences or association with reading. Levinson's (1987) original and clinically-informed use of the term "social lubricants" to describe how dogs facilitate rapport between a therapist and a child has now been used to describe an animal's function to create a safe learning environment and to ease discomfort within a child's learning environment when reading (Clark, 2003). In this way, dogs serve as "social lubricants" in reading contexts (i.e., reading facilitators) and as such, physical contact might not be required for an animal to provide a non-judgemental space for a child and to act as a catalyst for a reading task.

Third, this study is also guided by more recent research that focuses on motivation and learning. To expand on the proposed mechanisms of AAI discussed in the literature, Wohlfarth, Mutschler, Beetz, Kreuser, and Korsten-Reck (2013) put forward a theoretical model suggesting that animals increase children's implicit motives and these motives can be detected through measurable increases in task performance. In this way, an individual's experiential system, which processes all sensory information during an experience, also processes implicit motives. Implicit motives are what McClelland and colleagues (1989) call "natural incentives", they are associations with affective, and essentially non-verbal experiences (Wohlfarth et al., 2013). They are non-conscious and respond to body language and facial-expressions, including those of animals. In fact, mammals are posited to be capable of eliciting implicit motives, as all mammals share the motivational system that animates the formation of attachments and guarantees one's safety and protection. These implicit motives can have an impact on non-declarative

measures including task performance, attention orienting, and physiological changes. Conversely, Wohlfarth et al. (2013) posit that declarative measures including an individual's choices, attitudes, and judgments would not be affected because of engaging with an animal. In sum, AAIs that engage performance and learning situations, for example reading tasks, may enhance implicit motives and intensify the congruence of implicit and explicit motives. Greater congruence between these motives is beneficial to reduce intrapersonal conflict and increase intrinsic motivation (Schultheiss & Brunstein, 2010).

Finally, this study is guided by the work of Gee, Griffin, and McCardle (2017), who recently published an overview of the research on the inclusion of animals in classrooms and presented a new theoretical model addressing how HAI activities may impact learning. In this overview, it is stressed that there is no overarching theoretical framework in the transdisciplinary field of HAI. Given the wide range of AAIs, the authors note that the theoretical frameworks and theories guiding research to date include social development, motivation and learning theory. Gee and colleagues (2017) propose a unified framework in which motivation and self-efficacy, engagement/attention and executive functions (EFs), self-regulation and stress coping, and social interactions mediate the effect of HAI activities on learning and perhaps social-emotional development. In this way, the inclusion of an animal in targeted activities has an indirect effect on learning though increasing children's motivation and self-efficacy and enhancing engagement/attention and EFs.

### **The Reading Context and Reading Motivation**

Learning to read is a challenge that all children in most countries need to face, and

indeed it is a common challenge, as it is not uncommon to see children be presented reading texts that are too difficult for them. Difficulties related to learning to read can be biological in nature such as learning disabilities, or environmental/instructional such as when there is a mismatch between the book assigned to a child by an adult and the child's reading ability (Allington, 2002; Nevills & Wolfe, 2009). The situation in which a child is faced with a reading passage that is too difficult for him or her is particularly true and problematic for children with reading disabilities, as they almost always encounter texts that are well beyond their reading ability.

There is an important distinction to be made about texts that are too challenging and texts that are moderately challenging and that provide the right amount of challenge to promote literacy learning. According to flow theory (Csikszentmihalyi, 1991) and self-determination theory (Deci & Ryan, 1985), motivation is best supported by the experience of a moderate challenge, where the task presented it just beyond a learner's skill level. If the challenge is too great, engagement and enjoyment are negatively affected and the learner might perceive him- or herself as having less control over the task, which in turn can impede feelings of success (Pintrich & Schunk, 2002). Moreover, if a reading task is too challenging it may impede children's reading motivation and persistence (Fulmer & Frijters, 2011). Because encountering challenging texts is commonplace for children, it is important to comprehend if interventions such as animal-assisted reading programs are relevant to support student's motivation and persistence when a reading challenge is present. Specifically, it is fundamental to understand how reading to a therapy dog might provide a coping resource to mitigate negative motivational outcomes associated with being presented a challenging reading passage.

Also related to reading motivation and persistence is the type of attribution associated to the challenging reading task (Fulmer & Frijters, 2011). This relates to whether an individual attributes his or her failure to internal-stable causes which is a maladaptive interpretation because failure is regarded as being unchangeable, or to internal-unstable or external causes which is a better interpretation because performance is perceived as being changeable (Grant & Dweck, 2003). In this way, types of attributions can also be conceptualized as contributing positively or negatively to reading experiences, by either increasing or decreasing motivation to continue reading.

More specifically, Taboada, Tonks, Wigfield, & Guthrie (2009) suggest that intrinsic reading motivation accounts for significant and independent variance in reading comprehension performance and growth. As animal-assisted literacy programs ultimately aim to increase reading skills, it is important to consider the incentive behind the motivation to ensure the sustainability of positive effects. In fact, intrinsic reading motivation is positively associated with greater task persistence, text comprehension and academic outcomes, while extrinsic reading motivation is negatively associated with academic outcomes (Logan, Medford, & Hughes, 2011).

In light of the research on reading motivation, experiencing a challenging reading passage is commonplace for young readers when engaged in reading tasks. As suggested by Fulmer & Frijters (2011), it is important to better understand how interventions such as animal-assisted reading programs might provide a coping resource to mitigate negative motivational outcomes and thereby help to support student's motivation for a reading task.



### **Animal-Assisted Literacy Reading Program Outcomes**

While there has been increased attention on animal-assisted reading programs in educational settings over the past twenty years, research findings are preliminary and research methodologies are often not robust (Brelsford, Meints, Gee, & Pfeffer, 2017; Hall et al., 2016). Many opinion papers have been published suggesting that there are numerous benefits to participating in animal-assisted reading programs including reduced anxiety, increased reading motivation (Francis, 2009; Jalongo; 2005; Shaw 2013) and confidence (Francis, 2009; Lane & Zavada, 2013), and improved reading abilities (Jalongo, 2005; Lane & Zavada, 2013; Pillow-Price, Yonts, & Stinson, 2014; Shaw 2013). These papers do not make reference to formal assessments, but rather outline anecdotal evidence. Standardized measures of reading motivation following participation in a canine-assisted reading program are particularly lacking. Children's reading motivation in the literature is mainly assessed through interview data (Griess, 2010; Kirnan et al., 2016; Smith, 2009) and surveys (Paradise, 2007; Shaw, 2013) conducted with teachers (Smith, 2009; Lane & Zavada, 2013; Shaw 2013) and parents (Francis, 2009; Shaw, 2013).

Dog handlers have also reported increases in children's reading motivation through interviews (Kirnan et al., 2016; Shaw 2013). For example, Shannon (2007) conducted a study to explore the benefits of engaging in canine-assisted reading programs at libraries and after-school programs in the county of Nassau in New York. A total of 51 parents participated in this study by completing a survey questionnaire. In this study, the majority of the children (56.83%) were 7 or 8 years of age and half were female (49%). Some children had participated in a canine-assisted reading program at an after-school

center (56%) but most of these (73%) read to a dog only once. Most parents reported strongly agreeing that they would allow their child to participate in a similar program again (69%), that their child would want to participate in a similar program again (69%), that their child enjoyed their experience reading to dogs (73%), and that participating in the program was beneficial for their child (53%). Most parents were unsure whether the program increased their children's time spent reading for pleasure (46%) or if the program resulted in their children displaying improved fluency when reading out loud in front of people (40%). However, the majority of parents reported that participating in the program resulted in their children being more willing to read out loud in front of other people (56%), more confident about reading (60%), and having more positive attitudes towards dogs (76%).

While this latter study highlighted the potential benefits of engaging in a canine-assisted reading program, the findings are limited to parental reports of child outcomes. There is a need to collect objective data on children's reading abilities and reading motivations. While research on reading outcomes of canine-assisted reading interventions with experimental and quasi-experimental designs using standardized measures are still proliferating, several research studies point to some positive implications of reading in the presence of a dog during a reading task and the results of these studies are discussed in the next section.

Griess (2010) conducted a study on three children with learning disabilities participating in a canine-assisted therapy reading intervention. The purpose of the study was to investigate children's perceptions of their experience engaging in the program and the implications for reading progress. The intervention followed an ABAB design.

Phases, each consisting of nine 20-minute sessions, followed the following format: baseline (A1), intervention (B1), withdrawal of intervention (A2), and reintegration of intervention (B2). Results indicated that children spent more time reading when in the presence of the therapy dog in the intervention phases. Griess (2010) suggested that the children developed an increased motivation to read which was associated with the development of a bond with the therapy dog. While this study engaged children in AAT, the evidence suggests nonetheless that participating in a canine-assisted reading intervention can increase children's reading motivation. What remains to be investigated is whether programs that are less individualized (but still organized) can equally increase children's self-reported reading motivation and the time they invest in reading during these activities/interventions.

Paradise (2007) conducted a study on the Canine Assisted Reading Education (*C.A.R.E. to Read*) program implemented in Florida schools for reluctant readers in Grade 1 through Grade 5 between February 2002 and May 2006. The sample of this study included 98 students participating in the *C. A. R. E. to Read* program, with 19 students receiving personal instruction from a teacher without a therapy dog present and with 46 students who were classified as struggling readers receiving the same instruction without a registered therap. Additionally, 33 teachers of children participating in the *C.A.R.E. to Read* program completed a survey about the program. Teachers reported increases in confidence, skill, motivation and excitement to read among the students in the intervention group (reading to a dog) versus students in the control group. A "spillover" effect was also noted among the students in the intervention group, as

teachers noticed positive outcomes including enthusiasm, work quality and confidence in school activities that were not related to reading.

Smith (2009) conducted a study on the *Sit Stay Read* program implemented in Chicago for disadvantaged students in public schools. A total of 250 students in second grade participated in the study and were assigned to either an intervention or control group. The program lasted eight-weeks and was highly structured with multiple activities. Observational and interview data with students, teachers and administration was documented to capture the program's benefits and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) measures of Oral Reading Fluency (ORF), and attendance was recorded to support qualitative findings with quantitative data. Findings from the interviews with students suggested that they experienced increased reading motivation, general behaviour and excitement because of participating in the *Sit Stay Read* program. Specifically, students participating in the intervention attributed their perception of being better readers to the program, whereas teachers noted an increase in reading motivation though observation of reading behaviours and the number of books students read. Additionally, students in the program had a significantly greater increase in oral reading fluency over the comparison group. This study found a difference of 8.1 words per minute between students participating in the canine-assisted reading program and those who did not, with the former benefiting the most from gains in ORF with an increase of 43.21 words per minute from pre- to post-intervention.

In a comprehensive report, Shriberg (2013) attempted to replicate Smith's (2009) findings and reviewed the effects of the eight-week *Sit Stay Read* program on second grade students in a Chicago school. Three classrooms received the canine-assisted

reading program (intervention group) and four classes did not (control group). A total of 185 students in second grade participated in the study. The study found mixed results. It was found that, on average, students in the intervention group scored significantly higher in ORF on the DIBELS and tended to report more positive responses regarding reading attitudes. Interview data suggests that most students thought the program was good for second grade students and reported that they would recommend participating in the canine-assisted reading program to friends. However, no significant differences were found between groups related to reading comprehension, academic motivation and academic confidence from pre- to post-test.

Shriberg (2013) also collected data from 37 third grade students, 25 of whom participated in the canine-assisted reading program as second graders and who also completed the survey to obtain follow-up findings on the sustained impact of participating in the program. It was found that students who read to a therapy dog in second grade had significantly higher ratings of academic confidence and reported more positive attitudes towards reading than their counterparts in the control group who did not participate in the program. However, there were no differences between groups in terms of academic motivation due to a ceiling effect. While this study was indicative of short-term benefits of reading to a therapy dog, it also was indicative of sustained benefits related to overall academic confidence and positive reading attitudes.

Further, LeRoux, Swartz, and Swart (2014) conducted a randomized controlled study with students who were in Grade 3 but who were also reading below grade level and participating in the Intermountain Therapy Animals *Reading Educational Assistance Dogs (R.E.A.D.)* program. A total of 102 students aged 7 to 13 years identified as poor

readers in an Afrikaans elementary school in South Africa participated in the study. Students were randomly assigned to one of four groups: a dog group, an adult group, a teddy bear group and a control group. Participants had a total of ten 20-minute weekly reading sessions. The Neale Analysis of Reading Ability (NARA; Neale, 1999) was used to collect data on reading rate, reading accuracy and reading comprehension before the start of the intervention, after the completion of the 10-week program, and then eight weeks after termination of the program. Results indicated that the students reading to a therapy dog read at a significantly higher rate than the students reading to a teddy bear, although the effect size was medium-small. Also, results for reading rate indicated that on average students read more words per minute at the end of the intervention and at the follow-up than prior to the start of the intervention. Results also indicated that reading accuracy was greater in the dog group as compared with the adult group, the teddy bear group and the control group, and effect sizes were medium to high. Reading accuracy also increased significantly over time, although effect sizes were greater between the pre- and the post-test and follow-up, as compared with the post-test and the follow-up. Furthermore, students in the dog group scored significantly higher in reading-comprehension-ages as compared with students in the adult group, the teddy bear group and the control group, thus indicating that on average students who read to therapy dogs understood what they read significantly more as compared with the students in the other groups.

Although LeRoux et al. (2014) did not comment on the group X time interaction effects for reading rate or reading accuracy, evidence suggests that there are possible sustained benefits of reading to dogs with regards to reading comprehension. In fact,

children who read to therapy dogs had a higher reading comprehension than those who did not, and the lead was retained eight weeks after termination of the program. Moving forward, it would be interesting to determine if increases in reading rate and reading accuracy throughout the study persist among participants reading to a therapy dog, and to determine the ideal length of the canine-assisted reading program for supporting such sustained effects.

Finally, in an extension of their previous study, Kirnan et al. (2017) examined longitudinally the impact of a canine-assisted reading program. The program in question involved weekly small group (4-6 children) reading sessions with a therapy dog for approximately 10-15 minutes. In this study, they compared data from a second year of the canine-assisted reading program to determine if increases in reading scores extended beyond just increases in kindergarten for the first year of the program, as suggested by Kirnan et al. (2016). In the second year, the intervention that was followed was identical to the one followed in the first year. The results suggested that for the second year of the program, there was a significant mean difference in reading scores for participants in kindergarten and in Grade 1. Although no differences were noted in higher grades (Grade 2 to Grade 4), the evidence suggested that the effect of the reading program might be delayed for children in upper levels since older children might have less opportunity for growth as opposed to early readers who are still developing attitudes towards reading (Kirnan et al., 2017).

As the purpose of canine-assisted reading interventions is to cultivate students' reading ability, studies with stronger research methodologies have focused on reading achievement. The above literature review points to positive reading outcomes related to

reading rate, reading accuracy, and reading comprehension. However, research to date has not explored if the context of reading in the presence of a therapy dog is associated with different reading outcomes for individual children. This is important in light of recent calls for more rigorous research with proper controls (Gee, Griffin, & McCardle, 2017). Moreover, little is known about how the presence of a therapy dog is associated with differences in reading motivation and persistence, as measured through standardized measures. First, there is a need to define motivational constructs explored and discussed in canine-assisted literacy research. Second, children's reading motivation in this field of research requires more empirical documentation captured through standardized measures. Also, few studies mention how the difficulty of the reading task was controlled for the study. If therapy dogs can help alleviate the struggles associated with reading, then the reading context in which the therapy dog might be necessary should at least present some form of challenge. Presenting a challenging reading context to all participants is also a way to increase control of the study. With the field of human-animal interactions, including canine assisted literacy, calling for evidence-based research with stronger methodological rigor, it follows that studies should increase the level of control and use standardized measures with experimental designs (Hall et al., 2016; Serpell, McCune, Gee, & Griffin, 2017). Accordingly, the purpose of this proof of concept study is to address some of the methodological gaps noted above.



### **The Present Study**

Although research on animal-assisted literacy interventions is still developing, there is some research that highlights positive increases in reading motivation as a result of participating in canine-assisted reading programs. Canine-assisted reading programs such as the St. John Ambulance *Paws 4 Stories* program are developed to promote positive and supportive reading experiences to enhance children's reading skills, and as such there is an assumption that the reading process can be challenging for some children. However, little is known about how the context of reading to a therapy dog is beneficial for children engaging with these therapy dogs. This proof of concept study was conducted in collaboration with the St. John Ambulance Niagara Region branch to explore the impact of the presence (as opposed to the absence) of a therapy dog on reading motivation and persistence when children are confronted with a challenging reading passage. This study was guided by the following research question: Are there differences in reading motivation and persistence for individual children as a function of the presence or absence of a therapy dog when they are reading a challenging passage? Stated another way, is the presence of a therapy dog associated with differences in reading motivation and persistence for individual children when they are reading a challenging passage?

It was hypothesized that children would persist more when reading a challenging passage and would report being more motivated when reading when in the presence of a therapy dog. On the basis of the theoretical framework informing this study, we posited that the presence of the therapy dog, through its calm and non-threatening body language, would provide a space of acceptance in which children would be more inclined to take

reading-related risks. Moreover, based on Gee and colleagues' (2017) mediation model, we also posited that the presence of the therapy dog during the reading task would impact children's reading motivation. Although no theory distinguishes which constructs of reading motivation can be impacted by the presence of a therapy dog, evidence in the canine-assisted reading literature points to positive implication for reading interest and reading confidence.

In this study reading motivation was assessed through children's self-reports of reading interest and competence. As previously outlined, there is ample anecdotal evidence attesting to the increase of confidence that observers (i.e. parents and teachers) witness in children participating in canine-assisted reading programs. Confidence refers to an individual's willingness to engage in an activity. As such, given the theoretical foundations of how AAIs work to engage children in reading, it is understandable that past research has focused on confidence. Given the non-judgemental environment and the emotional support that therapy dogs provide, increases in children's willingness to engage in a reading activity and their self-reported level of confidence related to reading tasks) are a likely outcome of sitting beside and with a "non-judgement dog" and a book. However, this research study proposes that it may be more important to explore children's self-perceived competence. Competence relates to a child's self-assessment of their general sense of ability to accomplish a task. While it is important that children be emotionally supported when engaging with text when learning to read, it is also important that children believe that they have the capacity to undertake and complete a reading activity. Increasing a child's self-perceived competence may also be important to increase their engagement in reading activities, to ensure exposure to text, and to ensure that a

child obtains the experience necessary to advance his or her literacy learning. Past research suggests that the presence of a therapy dog can increase a child's emotional willingness to engage in reading activities, perhaps a dog might also be able to impact a child's general sense of ability related to reading. In this way, the presence of a therapy dog might indirectly influence a child's actual reading competence and ability by providing a context that might potentially mitigate negative associations with reading (e.g. lack of control over the activity, judgement of peers or adults). Therefore, this study explores whether reading in the presence of a therapy dog has an impact on children's self-assessment of their ability to accomplish reading activities, thus allowing them to read more and perhaps make important literacy gains.

As such we expected that the presence of a therapy dog would have a positive impact on both of these motivation constructs. Increases in children's interest to read would complement current qualitative evidence reported by Griess (2010) and by Noble & Holt (2018) of reported increases in children's interest to read. In addition, increases in reading motivation would support anecdotal accounts about increases in reading motivation among children when reading to a dog (Francis, 2009; Jalongo, 2005; Shaw 2013). On the other hand, although children's self-perceived competence to read has not been formally examined in the animal-assisted literacy research, many studies suggest that participating in a canine-assisted reading program can increase confidence and attitudes towards reading when gathering data from parent and teacher reports (Francis, 2009; Lane & Zavada, 2013; Paradise, 2007; Shannon, 2007). Smith (2009) found that some students reported being better readers as a result of participating in a canine-assisted reading program, thus perhaps implying a perception of reading competence, as

competence is the general sense of ability to accomplish a task. Accordingly, we expected that children's sense of competence would also increase as a result of the presence of a therapy dog during the reading task. Additionally, if dogs can positively impact implicit motives and these implicit motives can be detected by non-declarative measures (Wohlfarth et al., 2013), we posited that we would detect differences in time spent reading in the dog reading context as compared to the without dog reading context. Specifically, we anticipate that children will read longer in the presence of the therapy dog.

The design of this study involved the introduction of a challenging reading passage, thereby creating an environment in which it might be more important to introduce a reading facilitator such as a therapy dog. In this study, the use of a challenging reading passage was also critical in facilitating the detection of subtle but meaningful changes in children's reading motivation and persistence.

Moreover, we are not aware of any study that has explored the importance of the presence of a dog in a reading context with a within-subjects design. As this type of intervention is usually introduced to a self-selected population that is eager to engage with therapy dogs, it is interesting to evaluate if, on an individual level, these children really benefit from a canine-assisted reading context. Additionally, as with all domains of animal-assisted intervention research, there is a need for studies with more rigorous scientific methods (Hall et al., 2016; Kirnan et al., 2017). Consistent with the goal of this proof of concept study, which was to detect subtle changes in reading motivation and persistence among individual children as a function of reading in the presence or absence of a therapy dog, this study adopted a within-subjects design. Participants served as their

own controls, thus diminishing the influence of potential confounding variables. This design was optimal as it enabled the detection of subtle individual differences in reading motivation, persistence and behaviours, while still achieving good statistical power.

## Methods

### Participants

A total of 17 children (8 girls; 9 boys) in Grade 1 to Grade 3 (aged 6-8 years) and 16 parents participated in this study. Both mothers and fathers were invited to participate in the study. While several fathers participated, the majority of participating parents were mothers. The age of participating children ranged from 72 to 106 months; there were five 6-year-olds, five 7-year-olds, and seven 8-year-olds. Inclusion criteria for participation in this study were limited to children's school grade (i.e., being enrolled in Grades 1-3) and their ability to read independently. The sample included six children in Grade 1, four children in Grade 2, and seven children in Grade 3. Approximately 29% of the parents ( $n = 5$ ) affirmed that their child struggled with reading. However, only 12% ( $n = 2$ ) of children were receiving additional support for reading. It should be noted that the pattern of results for children receiving support for reading was comparable to the pattern of results for of the children not receiving support.

Note that while we did not formally assess the family's cultural and economic backgrounds, through the informal data collection process we observed that participants appeared to come from different social and economic backgrounds. It was evident that the participants in this study did not form a homogeneous group as there was cultural diversity in our sample. However, future research would benefit from addressing the question about how social class and cultural diversity intersect with the canine-assisted reading context.

## Procedure

**Recruitment and consent.** The *Paws Reading Study* was conducted in collaboration with the Niagara Region chapter of the St. John Ambulance Dog Therapy Program. Clearance from Brock University's Research Ethics Board for this study was received on September 19<sup>th</sup>, 2017 (#17-026 TARDIF-WILLIAMS; see Appendix A). Additionally, an approval letter was also obtained from St. John Ambulance to confirm this research collaboration (see Appendix B).

Participants for this study were recruited from the St. Catharines community. First, flyers were posted in public locations including community/recreation centers, bookstores, grocery stores, coffee shops, and Christmas parades (see Appendix C). Additionally, advertisements were posted on social media pages including the St. Catharines' Dog Lovers Association, the St. Catharines Standard, and the St. Catharines Public Library. As these recruitment strategies were only moderately successful, participants were also recruited via snowball sampling as children and parents started participating in the study.

Parents were invited to contact the principal student investigator by email to express their interest in participating in the study. Upon contact with the investigator, invitation letters and consent forms were provided to parents (see Appendix D). If parents were still interested in the study, an appointment was scheduled, and parents were invited to return the signed consent forms by email or to the St. John Ambulance Office at the time of their appointment. Materials in the consent package provided information regarding the purpose and goals of the study, as well as contact information if parents had questions or concerns about the study.

Prior to the beginning of the study, children's verbal assent was also obtained (see Appendix E). A verbal assent script was read to each child, emphasizing their right to withdraw from the study at any time without penalty. Parents were also informed of their own and their children's right to withdraw at any time, without penalty.

After completing all the activities for the study, children received stickers to thank them for participating in the *Paws Reading Study*. Adult participants (i.e. parents) were also compensated, as their names were entered in a draw to win a \$25 gift card at Chapters/Indigo. Two gift-cards were drawn with the odds of winning being approximately 1 in 10.

**Pilot testing of procedures.** Prior to the start of the data collection, all measures and procedures were pilot tested to confirm feasibility of administration and effectiveness of timings. The pilot testing was conducted in the same location as the study, but with a slightly older child; she was in Grade 6. The pilot testing allowed us to revise the timing and the delivery of our procedures.

**Data collection.** The data collection for this study occurred on Wednesday and Friday evenings from October 2017 to January 2018. Participants scheduled a single one-hour appointment to participate in the study. The data was collected in private and quiet spaces at the St. John Ambulance Main Office by the principal investigator, co-investigator, and three trained research assistants (undergraduate students attending Brock University).

The first component for children participating in the study involved a short individual interview (see Appendix F) in which children were asked questions about their



reading experiences. Each interview lasted no more than five minutes and was audio recorded for later transcription and to ensure accuracy of responses.

The second component of the study involved the completion of Woodcock Johnson III Tests of Achievement to assess basic reading skills. Children completed two subtests from the Woodcock Johnson III: First, Test 1 Letter-Word Identification and second, Test 13 Word Attack. Each subtest took approximately five minutes to administer, for a combined maximum of 15 minutes per child. Together, these subtests form the Basic Reading cluster, and this cluster was used to obtain each child's Lexile Reader measure. Specifically, after administration of both tests, scores were manually computed and entered in Compuscore, which is software designed to calculate children's reading ability based on scores from the Woodcock Johnson III test of Achievement (as described further below). Reading reports were therefore produced with grade equivalencies for children's reading level and their reading range. Grade equivalencies for the upper score of the reading range were then converted into Lexile scores with a Lexile to grade equivalency conversion chart. Two reading passages with the same congruous Lexile score were then selected for the two reading contexts. Further details of this process are provided in the next section.

The third component of the study involved the reading tasks. Children were first randomly assigned to one of two contexts: reading without a therapy dog present, or reading in the presence of a therapy dog. These two conditions were counterbalanced to avoid an attrition effect (as children were very eager to read to the dogs first). Participants were invited to sit on a blanket on the floor with the therapy dog and were permitted to interact with the dog if they wanted to; note that, in the dog absent condition, participants

were also invited to sit on a blanket on the floor but without a therapy dog present. When children were assigned to the reading context in which the therapy dog was present, they were invited to read in the presence of an observer (i.e. research assistant), a dog handler and a therapy dog. Similarly, in the without dog context, they were invited to read a passage in the presence of the observer and a dog handler. The instructions given and the procedures followed for dog context were identical as in the reading context without the dog. Similar to the procedure used by Fulmer and Frijters (2011) children were given the first part of a reading passage and instructed to read the story out loud as best they could. As the child read, the observer quietly took notes and timed the reading session. When the child was finished reading, he or she was asked if they would like to continue reading the story. If the child said yes, the observer gave the second part of the story to the child, instructed the child to continue reading out loud and to stop whenever he or she wanted to stop, and timed the activity. If the child no longer wished to continue reading then the observer moved forward with the next component of the study. Reading tasks took up to 12 minutes per context for a maximum of 24 minutes.

The fourth component of this study involved completion of the IMI-R (as described in further detail in the next section), which children completed after each of the separate reading contexts. As such, children adhered to the following procedure: reading task Context A, IMI-R for Context A, reading task Context B, IMI-R for Context B. It should be noted that between the administration of the IMI-R for context A and the reading task for context B, children were given a short break of approximately five minutes to have a snack and/or do some colouring. Before administering items from the IMI-R, three calibration items were administered to ensure that children understood the

task and that the scale was appropriate. Then, if children had just previously read without the therapy dog, participants were asked to respond to items on the IMI-R while thinking about that context. Conversely, children who had just previously read in the presence of the therapy dog completed items on the IMI-R thinking about that context. Scenarios were contextualized so that children could be reminded of the context in which they had just read. Completing the IMI-R took less than five minutes to administer, for a combined maximum of 10 minutes per child.

The final component of this study involved a post-test interview with the children responding to questions about their reading experiences both with and without the therapy dog. This component took a maximum of five minutes to administer and complete. Once children completed the interview, they were thanked for their participation, given stickers, and reunited with their guardian. Overall, participation in this study took approximately 45 minutes to one hour.

Additionally, parents were invited to complete a brief questionnaire about their child's general reading behaviours (see Appendix F). On average, this questionnaire took 15 minutes to complete. The questionnaires were distributed to parents upon arrival for their appointment or via email. Parents filled out the survey while waiting for their child to complete the study.

### **Reading Measures**

**Individual interviews with children.** Child participants took part in a brief interview at the beginning and at the end of the study to assess their preferred reading contexts (see appendix F). The pre-test interview included nine questions and the post-test interview included 10 questions. Interviews were semi-structured and included open-

ended questions such as “Do you like to read (and why or why not)?” and “Do you prefer to read alone or with someone?” Additional questions were asked upon completion of the study to elucidate children’s enjoyment of the reading contexts of the study – reading with and without a therapy dog. Additional questions for the post-test included “What was the best part about reading to [name of one of the therapy dogs]?” and “Did you prefer reading with the therapy dog or without the dog? Can you tell me why?” Note that several of these interview questions were not analysed as they were used to build rapport with the child participants. From the pre-test questions, we analysed the following dimensions: interest, preference, enjoyment. It was ascertained from the pre-test interviews that 15 participants enjoyed reading. Most of the children (73.3%, n = 11) preferred to read with a parent and very few (17.6%, n = 3) children reported that they had read to a dog in the past.

**Woodcock Johnson III Test of Achievement (WJIII; Woodcock, McGrew, & Mather, 2011).** To determine what level of passage difficulty to assign to each child, the Basic Reading skills cluster of the WJIII was administered, which included both Letter-Word Identification (test 1) and Word Attack (test 13). These batteries have been validated for individuals aged 2 to 90+ years. For the purposes of this study, the Letter-Word Identification subtest was administered first, which required children to identify letters and words of increasing difficulty. A research assistant recorded children’s pronunciation of words. Participants were then administered the Word Attack subtest, which assessed children’s ability to decode unfamiliar words. Children relied on phonetic skills to read letters and nonsense words of increasing difficulty. Together these tests allowed us to determine each participant’s individual reading range, which in turn

allowed us to assign developmentally appropriate reading passages to each child. Raw scores were entered into the Compuscore software and profiles for each child were produced, with a developmental reading grade level as well as a reading range in grade equivalencies. Scores for the Woodcock-Johnson III subtests ranged from 9 to 65 for the Test 1 Letter Word Identification, and from 3 to 30 for the Test 13 Word Attack. Children obtained grade equivalencies of K.5 to 7.1. We assigned reading passages ranging from 40 to 830 Lexile. Nine children were assigned to the alone context first, and the remaining eight children were assigned to the read in the therapy dog context first.

**Intrinsic Motivation Inventory – Reading (IMI-R; Frijters 2004).** The IMI-R is an adapted version of Ryan and colleagues' Intrinsic Motivation Inventory (Ryan 2002; Ryan Connell & Plant, 1990). Items are clustered into three categories: Interest, Self-perceived competence, and Effort. To assess children's reading motivation in each reading context, we administered items pertaining to interest and self-perceived competence. For ease and suitability of administration, items related to children's self-perceived effort were not administered because children in the sample were considered too young to adequately assess their effort in a reading task (Frijters, personal communication, April 11, 2017). Each category consists of eight items verbally presented to the children and are rated on a 4-point Likert scale ranging from "not true at all" to "very true". The scale was adapted for children, as they responded by indicating one of four circle sizes (increasing in size) that best represented the magnitude with which they agreed with the statement. For example, statements of interest included: Story reading is fun to do, I like reading stories, and If I could choose what to do right now, I would read a story. It should be noted that, before introducing the test to each child, the research

assistant first presented three calibration items (positive, negative and neutral) unrelated to the topic of reading to ensure that the child correctly understood the procedure to be followed. As the sample size of this study was small, it was not possible to standardize this measure. Nonetheless, this measure is reliable and validated, as confirmed by Fulmer and Frijters (2011) where internal consistency reliability was high for each of the subscales (interest subscale = .87; self-perceived competence subscale = .87).

**Observer checklists of reading behaviours.** For each participating child, a research assistant gathered basic qualitative data through non-intrusive observations in both reading contexts, namely in the presence and absence of a therapy dog (see Appendix F). Observers noted children's desire to read, their overall reading enjoyment, confidence, engagement, their overall reading time, their approach and emotional stance about reading in the given context (e.g. Did they seem excited or apprehensive about reading to the therapy dog?), and their desire to persist in the reading task (as reading tasks were designed as a timed activity that children could choose to continue or discontinue). The observer checklists respectively included 13 and 17 simple items for the two reading contexts (with and without a therapy dog present).

**Parent observations of child reading behaviours.** Parents participating in the study completed a short survey on their child's typical reading context at home. The 10-item questionnaire inquired whether the participating child reads alone or with someone, how often they read, if they read spontaneously, and if they read silently or out loud. Additionally, parents were asked if their child struggled with reading, and if so, with regards to what aspect of reading, and they were asked to provide details about if the child received reading support. Responses to closed-ended questions were either

dichotomous or on a 7-point Likert scale ranging from “addressing how often children read at home. For example, when asked “How often does your child read at home?” parents were instructed to circle one of the following answers: never, 1/week, 2/week, 3/week, 4/week, 5/week, or more than 5/week.

### **Selection of Reading Passages**

Drawing on the research by Fulmer and Frijters (2011), the selection of reading passages was done using the Lexlie Framework for Reading. This analytic tool allowed us to first match each participant to appropriate reading passages for their developmental age and subsequently assess reading persistence with greater accuracy.

First, we anticipated Lexile measures and grade level reading equivalencies for children in Grade 1 to Grade 3. Specifically, we anticipated that participant reader measures would range approximately from <1 to 4.5 in grade equivalencies, which is equivalent to Lexile scores of BR120L to 760L. This estimate is based on the Lexile to grade correspondence table for Typical Reader Measures by grade (MetaMetrics, 2017).

Second, appropriate stories for expected Lexile scores were identified. The list of reading passages prepared, and examples of reading passages can be found in the appendices (see Appendix G and Appendix H). For the purpose of this study, children were assigned reading passages that were slightly beyond their reading ability. Specifically, a decision was made to use the top of children’s developmental reading range to challenge children without inducing distress. In a couple of cases the child participants were not being challenged enough with the upper range of the Lexile reading range, as a ceiling effect was starting to be noticed. Therefore, a decision was made to challenge participants a little more by using the upper score of the reading range provided

by the Compuscore software. To determine children's developmental reading range (i.e. Lexile range), raw scores from the Woodcock-Johnson III subtests and demographic data were then inputted into the Compuscore software (i.e., the WJIII software) and both a reading level and a reading range in grade equivalencies were produced. In choosing the grade equivalency for upper scores of the reading range, as calculated by Compuscore, it was possible to ensure that each individual child would be appropriately challenged during the reading task; in this way, each child's reading ability was not mismatched with the difficulty of the selected passage. Grade equivalencies were then converted into Lexile scores, as each reading passage was selected through its Lexile reader measure. Appropriate stories for each Lexile value ranged up to 810L.

Third, two passages for each level were selected. For the purposes of this study, a decision was made to standardize the format of all the reading passages. Standardizing all reading passages allowed us to minimize any possible influence that the format of the books might have on children's reading experience. As such, participants were not differently impacted by amount of words on each page or the font of the writing, nor were they distracted by any pictures. All excerpts of the stories were typed on a Microsoft Word processor. The font was standardized to Times New Roman style with a font size of 16 points, and original pictures and colours were omitted. Passages were split in two parts and printed on separate sheets of paper. Stories were then inserted into plastic sheet protectors to avoid damaging, as passages were reused for participants when appropriate (i.e., when children were assigned the same story). As the children were paired to a passage that was intended to be challenging for them it was unnecessary to provide



lengthy passages. The following reading passage is an excerpt of a story with a Lexile Measure of 500L:

### **Berenstain Bears Around the World (500L) Part A**

The Bear family is visiting the Great Bear Museum. Doctor Bear shows them the globe of the earth. “We live right here,” he says.

“It would be fun to travel all around the world,” says Sister.

“I agree,” says Doctor Bear. “Just follow me.”

“Just step inside my Anywhere-Anyplace Machine,” says Doctor Bear.

He pushes a button.

Everything starts to spin!

When things stop spinning...

*They are in another country!*

Fourth, the grade-level accuracy of selected passages was confirmed by using the Lexile Analyzer provided on The Lexile Framework for Reading website. This analyser is an online resource to verify the Lexile text measure of the passage inserted into the system.

#### **Data Analysis**

Statistical analyses for this study were performed with IBM SPSS 23. Variables were coded and entered in the statistical software. Quantitative data was collected through assessments of each participating child on the following reading areas in both

contexts: reading interest for task, self-perceived reading competence for task, and reading persistence for task.

**Defining reading interest for task.** While reading interest is defined in various ways in the literature, the present study relies on Conradi, Jang, and McKenna's (2014) definition of interest. Authors define interest as "a positive orientation toward reading about a particular topic" and make the distinction between individual interest and situational interest. Individual interest is fairly secure and durable, while situational interest is context-specific and provisional. As measuring individual interest was beyond the scope of this paper, the current study explores children's situational interest for the canine-assisted reading context with a therapy dog. Reading interest was assessed quantitatively with the IMI-R. Specifically, scores of the eight items in the interest component of the IMI-R were tallied for participants in each reading context. As such, two quantitative reading interest variables were computed: reading interest in the dog context and reading interest in the no dog context. Additionally, reading interest was assessed qualitatively with the observer checklist of reading behaviours. Scores on interest in the reading task ranged from 8 to 32 without the presence of a dog, and from 15 to 32 in the presence of a therapy dog.

**Defining self-perceived reading competence for task.** Within the literature, perceived competence refers to an individual's, in this case a child's, self-assessment of their general sense of ability to accomplish a task. In regards to reading, perceived competence is in fact a subcomponent of the construct of self-concept, one's general self-perception as a reader (Conradi, et al., 2014). As self-perceived reading competence for task was assessed quantitatively with the IMI-R, the scores of eight items in the self-

perceived competence component of the IMI-R were tallied for participant in each reading context. Subsequently, two quantitative reading interest variables were computed: self-perceived reading competence in the presence of a therapy dog and self-perceived reading competence without the presence of a therapy dog. Children's self-perceived competence scores ranged from 8 to 31 without the presence of a dog, and from 11 to 32 in the presence of a therapy dog.

**Defining reading persistence for task.** Reading persistence is not defined as a motivation construct within the reading motivation literature. This may be because it is a performance outcome of reading motivation rather than what scholars refer to as a genuine motivational construct, such as reading attitudes and dimensions of reading motivation, or a factor affecting reading motivation, including antecedents or predispositions of reading motivation (Conradi et al., 2014; Schiefele, et al. 2012). In this study, reading persistence was assessed by behavioural measures of both decisions of task continuation and of time spent reading. Participant's decision to continue or discontinue the reading task was recorded when giving them the option after completing the first page of a story. A similar procedure was used by Fulmer and Frijters (2011) to assess reading persistence for children in middle school. This method was deemed applicable for the present study, to match children to reading passages with the appropriate reading difficulty and length. This variable was computed as a categorical response for both contexts. Additionally, children were timed in seconds for their time spent reading each part of the story in both contexts. The time spent reading each part of the story within the same context was recorded and added to produce a total time spent reading for each child in each context. This variable was then used to compare average

times spent reading for both contexts. The time participants spent reading ranged from 85 seconds to 767 seconds without a therapy dog present, and the time they spent reading in the presence of a therapy dog ranged from 178 seconds to 1072 seconds. Because this variable was log transformed, it should be noted that the log of the time participants read ranged from 1.93 to 2.88 without the presence of a dog, and from 2.25 to 3.00 in the presence of a therapy dog.

## Results

### Preliminary Analyses

To begin, all variables were inspected on SPSS for accuracy of data entry, missing values, as well as assumptions of both univariate and multivariate analysis.

### Univariate Assumptions

First, univariate assumptions of normality were verified including missing, values, skewness, kurtosis, and outliers. Missing values were verified with the “frequencies” function in SPSS. Analyses revealed sporadic cases of missing values across multiple variables in the Observation Checklist of Child Reading Behaviours and the Parent Observations of Child Reading Behaviours. Missing values were coded as missing which was assigned a “999” code. As cases were not missing across multiple data points and the missing values were not in outcome variables, they were not removed.

Outcomes variables were then verified for skewness and kurtosis both through the descriptives function on SPSS and probability – probability (P-P) plots for each variable. Skewness and kurtosis values are provided in Table 1. Analysis of the descriptive statistics and P-P plots suggests that the distribution of scores across all three outcome variables (i.e. interest, self-perceived competence and time spent reading) in both conditions (i.e. with and without a therapy dog) were positively skewed. Additionally, analysis of the descriptive statistics and P-P plots suggests that the distribution of scores for interest in the without dog condition and for time spent reading in both conditions are platykurtic. Conversely, the distribution of scores for interest in the with dog condition and for self-perceived competence in both conditions are leptokurtic.

Next, outliers were identified with the explore function on SPSS. The scores for

one participant were identified as including outliers for the interest and self-perceived competence scores in both conditions. Additionally, the scores for two other participants were identified as outliers: one for a participant's interest score when reading to the therapy dog, and the other for a participant's score on time spent reading without the therapy dog.

Taken together, a decision was made to do a log transformation of the time spent reading variable. This correction addressed some issues with the distribution of scores for that outcome. As such, moving forward, the log of the time spent reading to the therapy dog was the outcome variable used to measure participants' reading persistence for all analyses.

Table 1

*Mean Scores, Skewness, and Kurtosis on Self-Perceived Interest, Self-Perceived Competence, and Log Of Time Spent Reading in Both the With and the Without Dog Reading Conditions*

Outcomes (N= 17)	Mean		Skewness		Kurtosis	
	<u>Without</u> <u>Dog</u>	<u>With</u> <u>Dog</u>	<u>Without</u> <u>Dog</u>	<u>With</u> <u>Dog</u>	<u>Without</u> <u>Dog</u>	<u>With</u> <u>Dog</u>
Self-Perceived Interest	25.53 (7.23)	28.71 (4.38)	-1.42 (.55)	-2.01 (.55)	1.38 (1.06)	4.78 (1.06)
Self-Perceived Competence	26.82 (6.27)	28.59 (5.41)	-2.02 (.55)	- 2.44(.55)	4.27 (1.06)	6.79 (1.06)
Log of Time Spent	2.49 (.27)	2.65	-.88 (.55)	-.11 (.55)	.31 (1.06)	-.49

Reading	(.21)	(1.06)
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### **Descriptive Statistics**

To a certain extent, the child participants in our sample had different home reading experiences. According to parent reports on the parent observations of child reading behaviours survey, 82.4% of the children ( $n = 14$ ) participating in our study read regularly at home. Of these 14 children, nine (64.3%) read at least five times per week. Parents also confirmed that 14 children in our sample read spontaneously at home, but only five children of the entire sample read alone silently at least five times per week. Additionally, it should be noted that 13 children (76.5%) of the children had family pets, but only three (23.1%) of these children were reported to read to the family pet. Therefore, it can be concluded that for most of the children in this study reading to a dog, and specifically a therapy dog, was a new experience.

### **Motivation Measures**

A multivariate repeated-measures ANOVA with two levels (i.e. two-factor repeated measures design), was conducted to assess the differences in reading motivation and reading persistence as a function of the presence or absence of a therapy dog when children read a challenging passage. In this model, there were three continuous dependent variables (i.e. self-perceived interest, self-perceived competence in reading, and persistence expressed in seconds spent reading) and one categorical independent variable with two levels (i.e. condition with or without the therapy dog).

As Wilk's Lambda was significant, and analyses were pursued to apply the multivariate repeated measures ANOVA for each dependent variable. The following SPSS outputs were generated: Malauchy's test of sphericity, the F table for the multivariate repeated measures ANOVA, and pair-wise comparisons of means for each dependent variable.

First, it important to note that according to the SPSS output Malauchy's test of sphericity failed,  $X^2(0) = 0, p = \text{ERROR}$ . However, sphericity is always met with two time points. Moreover, with small sample sizes, large violations of the test can be non-significant. Because we have two time points and a sample size of 17 participants, it is possible to continue and proceed with the test while assuming that nothing was known about sphericity. When nothing is known about sphericity it is recommended to proceed with the Greenhouse-Geisser estimates of sphericity ( $\epsilon = 1.0$ ), which is a more conservative correction (Field, 2012). However, it should be noted that for sphericity assumed and for all three corrections output results are identical.

Means and standard deviations for interest and persistence are presented in Table 1. Results show that there was a significant effect of reading condition on all three dependent variables  $F(3, 14) = 3.89, p = .033$ , partial  $\eta^2 = .454$ , and the size of the effect was strong. Further, univariate tests reveal that as a group, participants scored higher in the reading with a dog condition as compared to the context without the dog on self-perceived interest,  $F(1, 16) = 5.15, p = .037$ , partial  $\eta^2 = .244$ , self-perceived competence,  $F(1, 16) = 5.13, p = .038$ , partial  $\eta^2 = .243$ , and reading persistence,  $F(1, 16) = 10.88, p = .005$ , partial  $\eta^2 = .405$ . It should be noted that the sizes of these effects are moderate to strong, with the stronger effect related to time spent reading.



Due to our sample size, these significant findings were examined further using non-parametric testing. A Wilcoxon signed-rank test showed that the presence of a therapy dog during a challenging reading task elicited statistically significant changes in self-reported reading interest,  $Z = -2.24$ ,  $p = .025$ ,  $r = 0.4$ , self-perceived confidence,  $Z = -2.12$ ,  $p = .034$ ,  $r = .51$  and time spent reading,  $Z = -3.01$ ,  $p = .003$ ,  $r = .63$ . Across all dependent variables, scores in the dog context were greater than scores in the no dog context. These findings corroborated the results of the MANOVA, and across all dependent variables the participants scored higher when reading with a therapy dog when compared to reading without the therapy dog.

### **Colinearity**

Results suggested that the self-perceived competence and interest scores were strongly correlated ( $r = .82$ ,  $p < .001$ ), and the interest and the log of time scores were moderately correlated ( $r = .36$ ,  $p = .15$ ); the interest and log of time were not significantly correlated ( $r = .23$ ,  $p = .37$ ). Because the interest and self-perceived competence scores were found to covary significantly (both are self-report measures) it might be prudent to consider collapsing them in a future study, as they might not significantly contribute unique variance in the model.

### **Task Continuation**

Analysis of the Observer Checklist of Child Reading Behaviours suggests that 41.2% ( $n = 7$ ) of participants chose to read the second part of the story when in the without dog context as compared to 70.6% ( $n = 12$ ) in the dog reading context. All children who chose to continue reading without the presence of the therapy dog also continued reading when the therapy dog was present. It should be noted that children who

chose to continue reading when the therapy dog was not present were more likely to be the stronger readers in our sample, as assessed through their Lexile scores. Conversely, the range of reading abilities was greater for children choosing to continue reading in the presence of the therapy dog.

Further analysis of the OCCRB revealed that in the without dog context, most children were either somewhat engaged in the reading task (29.4%), neutral (29.4%), or very engaged (11.8%), while a couple of children were not very engaged (10.8%) and one child was not at all engaged in the reading task (5.9%). In the presence of the therapy dog, many children (41.2%) were very engaged with the reading task, while others were neutral (23.5%) or somewhat engaged with the reading task (17.5%). Very few participants were not at all engaged with the reading task (11.8%) or not very engaged with the reading task (5.9%). Moreover, 29.4 % of children seemed distracted when reading in the dog condition as compared to 17.6% in the without dog context. With regards to the engagement with the therapy dog in the with dog condition, results indicate that many children were somewhat engaged with the therapy dog (47.1%) or not very engaged with the dog (35.3%). Very few children were not at all engaged with the therapy dog (11.8%) or neutral (5.9%). When children engaged with the therapy dog, most children would pet the therapy dog (29.4%) and/or glance at the therapy dog while reading (29.4%). Very few (11.8%) engaged with the therapy dog by talking to it.

### Discussion

The research question leading this proof of concept study aimed to explore if the context of reading to a therapy dog might impact children's reading motivation and persistence. To explore this question, attention should be drawn to the organisation of the reading task. First it was important to control for the difficulty of the reading task by assessing children's reading ability and providing reading passages that offer the same level of challenge to all participants.

Overall, this study's results suggest that the presence of a therapy dog may have positive implications on children's self-perceived reading motivation and their reading persistence. These results are consistent with the results of previous research demonstrating increased reading motivation and reading engagement among children as a result of participating in canine-assisted reading interventions (Hall et al., 2016). Moreover, this study's results may help contextualise the process by which children are more likely to read if they are in a canine-assisted reading context as they learn to read. In fact, if children are more motivated to read and persist longer when reading to a therapy dog, then there is more opportunity for literacy growth, which may explain the positive benefits of reading to a therapy dog on children's reading achievement scores. As such, findings may help support the hypothesis put forward by Hall et al. (2016) suggesting that increasing children's reading motivation may be the process by which therapy dogs help to increase reading achievement scores. Further research should explore how the presence of a therapy dog may moderate the relationship between reading motivation and reading achievement.

Independently, an effect of the reading condition (i.e. with or without a therapy

dog present) was also found for each outcome variable. First, analysis of the univariate tests of the multivariate repeated-measures ANOVA with two levels (i.e. two-factor repeated measures design) suggests that children reported being more interested in the challenging reading task when a therapy dog was present. These findings corroborate qualitative evidence reported by Griess (2010) and by Noble & Holt (2018) of children's increased interest to read in the presence of a therapy dog. Additionally, our findings are consistent with the abundance of anecdotal evidence reporting increases in reading motivation (Francis, 2009; Jalongo, 2005; Shaw 2013). Although therapy dogs may not have a direct impact on the qualities of the book itself, it may have an impact on children's self-perceived experience of the reading task and perceptions of the book's interest level. In this way, the therapy dog may create an environment in which the child experiences more positive feelings in relation to the situation despite the challenges presented. Future research should explore whether positive feelings about the reading experience in the presence of a therapy dog are associated with reading interest.

Children also reported being more competent when reading a challenging reading passage in the presence of a therapy dog. To our knowledge this is the first study exploring children's self-perceived competence in reading. Nonetheless, our findings substantiate parent and teacher reports of increased confidence and positive attitudes towards reading when in the presence of a therapy dog (Francis, 2009; Lane & Zavada, 2013; Paradise, 2007; Shannon, 2007). Moreover, our findings also complement those of a study by Smith (2009), which reports a positive outcome on self-perceived reading ability resulting from participation in a canine-assisted reading program. At the end of the program, students reported being better readers which may be associated with a

developed sense of reading competence. Results of the present study suggest that although participating in a canine-assisted reading program increases self-perceived reading competence, the context itself also increases self-perceived competence. Even after a single reading session, the children in this study reported being more competent to engage with a challenging reading passage in the presence of a dog as compared to the same reading context without a dog. Evidently the presence of the therapy dog does not directly impact children's reading competence. However, therapy dogs may provide a safe space in which children more positively assess that they have the proper abilities to accomplish the challenging reading task. In this way the presence of the dog might mitigate negative associations to reading that might previously have existed in the typical reading context which does not involve a therapy dog and which might be associated with diminished sense of reading competence among children. As children grapple with the reading task, this increased persistence may be related to increases in their perceived self-competence. Further research should explore whether children's time spent struggling with a challenging reading is associated with their self-perceived reading competence when in the presence of a therapy dog.

Finally, univariate analyses also indicated that children spent more time reading in the presence of the therapy dog. This effect was expected as these interventions assume that the presence of therapy dogs during reading tasks will help increase children's reading enjoyment. This finding supports Wohlfarth and colleagues' theory (2013) on how dogs can impact children's implicit motives, as time spent reading is a non-declarative measure that increases when children read in the presence of a therapy dog.

Our findings support the theory of motivation and learning by Wohlfarth and

colleagues (2013) in the context of AAIs. As the dog provides an affective and non-verbal presence, children are non-consciously affected by the dog's body language and facial expressions. Exploration of the dog's body language and behavioural indicators of the child's acknowledgement of such subtle cues were beyond the scope of this study. However, we observed an increase in time spent reading in the presence of a dog. This non-declarative measure of task performance points to an increase in children's implicit motives when reading a challenging passage in the presence of a dog. This evidence speaks the possibility of children making more positive associations when reading in the presence of a dog.

Moreover, our findings also support Gee and colleagues' (2017) proposal of a unified framework. Recall that this framework explains how the inclusion of an animal in targeted activities may have an indirect effect on socio-emotional development and learning through the four following mediators: 1) motivation and self-efficacy (hot EFs), 2) engagement and attention (cold EFs), 3) self-regulation and stress coping, and 4) social interactions. On the basis of our findings, our study supports the notion that the presence of a therapy dog might have been associated with increases in EFs when children were faced with a challenging reading task. Specifically, increasing children's motivation is a mechanism through which the presence of a therapy dog may impact children's literacy learning when the reading task is challenging. Further research is needed to explore if 1) engagement and/or attention (cold EFs), 2) self-regulation and stress coping, or 3) social interactions are all mechanisms through which the canine-assisted reading context affects children's literacy learning. Additionally, if one follows this model, increasing reading motivation may be a pathway through which canine-assisted reading may impact

children's socio-emotional development. While the exploration of this relationship is beyond the scope of this research, future studies may wish to explore this relationship and its association with literacy learning.

Recall that in their theoretical model of motivation and learning, Wohlfarth et al. (2013) posit that the mechanism related to positive AAIs is related to how animals increase children's implicit motives and these motives can be detected through non-declarative measurable increases in task performance. The findings of this study support this hypothesis, as the non-declarative measures related to children's persistence with the reading task produced more positive outcomes in the presence of a therapy dog than without the presence of the therapy dog. Specifically, more children accepted to read a second part of the story when in the presence of a therapy dog, and on average the children spent more time reading, in the presence of a therapy dog. As such, our data suggests that the child participants' implicit motives were positively impacted by the presence of the dog, as measured through our non-declarative measures of task continuation and time spent reading.

Surprisingly, our findings extend the theory of motivation and learning by Wohlfarth and colleagues (2013), as declarative measures of participant's self-perceived interest and competence related to the reading task were greater in the dog context. If one follows this theory, animals, including dogs, can increase children's implicit motives and this can be indirectly measured through the non-declarative measure of performance. Conversely, explicit motives could be measured through self-report measures such as choices, attitudes, and judgments (Wohlfarth et al., 2013). However, this theory of motivation and learning does not suggest whether animals might elicit explicit motives.

As such, it would not be expected that the presence of a dog during a reading task would have an impact on participants' self-reports of reading motivation, specifically their reading interest and reading competence. Nonetheless, our findings support the abundance of anecdotal evidence and the results of previous research on increases in children's reading motivation when engaging in canine-assisted reading activities.

Our findings suggest that when we apply the theory of motivation and learning by Wohlfarth et al. (2013) to the canine-assisted reading context, the positive impact of the presence of a therapy dog extends beyond increases in implicit motives by also eliciting explicit motives. If the canine-assisted reading context can indeed have a positive impact on both children's implicit and explicit motives, then congruence of implicit and explicit motives may be associated with high intrinsic motivation and successful performance. This would support the research suggesting that the canine-assisted reading programs can help increase children's reading skills such as reading accuracy (LeRoux et al., 2014; Treat, 2013), reading fluency (Smith, 200; Smith & Meehan, 2010; Treat 2013), and reading comprehension (LeRoux et al, 2014; Treat, 2013; Wohlfarth et al., 2014). Additionally, congruence between the two forms of motivation is associated with benefits related to well-being and health (Schultheiss & Brunstein, 2010). Therefore, benefits of reading in the presence of a therapy dog may extend to children's health and well-being. As such, following this theoretical framework, future research should investigate if there is indeed congruence between these two forms of motivation in the canine-assisted reading context, whether it may be indicative of high intrinsic motivation for reading and whether it may be associated with benefits related to well-being and health.

It is noteworthy that despite this study's small sample size our results are also



supported by non-parametric tests. A Wilcoxon signed-rank test was conducted and findings suggest that reading to a therapy dog in the context of a challenging reading passage may improve self-perceived reading interest, self-perceived competence and time spent reading in a statistically significant way. These results corroborate our parametric findings and give more weight to this proof of concept. Our results strongly suggest that the presence of a therapy dog has an impact on children's reading motivation and reading persistence, as confirmed through the use of reliable and validated motivation measures.

Moreover, the non-judgemental space the therapy dog provides may increase a child's sense of competence when faced with a challenging reading task. According to Cambourne (1988), it is necessary for children to take reading risks to promote literacy learning. If children feel more interested and more competent, they are presumably more inclined to take risks and persist longer when reading even if the reading passage is challenging. In fact, our results suggest that in the presence of a dog, children spent more time engaging with a challenging reading passage. This finding may be especially meaningful to help develop interventions for struggling readers. The presence of a therapy dog may indeed provide a positive reading context conducive to working through the challenges associated with reading for struggling readers by increasing children's self-perceived reading interest, their self-perceived competence, and the time spent reading. In sum, our study suggests that the presence of a canine reading buddy may increase reading motivation and reading persistence when the reading task is challenging, which in turn may subsequently facilitate literacy learning.

### **Implications of the study**

This study suggests that dogs can indeed play an important role in supporting

young children's incentive and diligence to engage in reading tasks, specifically and perhaps more importantly when the task presents a moderate challenge. Our results suggest that a focus on increasing student's reading motivation might be relevant to designing canine-assisted reading programs. Our results showed that young children are more interested in reading tasks and persist longer in the presence of a therapy dog when the reading task is challenging. Regarding practical implications, this study's results support the need for canine-assisted reading programs for young children to promote literacy learning; to some extent, this type of program might be more relevant among young readers because they often have to engage with challenging reading tasks in schools and at home to learn to read. This study's findings hold promise for educators and parents striving to find novel ways to engage their children with stories. In fact, we suggest that more attention should be drawn to the canine-assisted reading context. It is apparent that more educational resources should be put into the development of canine-assisted reading programs available to children across Ontario and Canada.

Moreover, this study holds important theoretical implications. Consistent with Mueller's (2014) application of Overton's (2013) relational-developmental systems approach to the context of human-animal interactions, our study suggests that dogs are an important part of children's ecology, as they play an important role in children's education and developmental growth, notably during canine-assisted reading activities. This developmental growth was not directly observed in our study, however individual children's perceptions of the reading task (i.e. self-perceived interest and competence) and their persistence were measured and compared in both contexts. The positive effects of the presence of a therapy dog were observed across all measures, which suggest that

increasing children's motivation and persistence may be an underlying mechanism by which the presence of a dog can positively impact literacy learning and development. Moreover, this is consistent with the theory of motivation and learning as a mechanism of AAI put forward by Wohlfarth et al. (2013).

Our findings also suggest that children's implicit motives, as measured through non-declarative measure of persistence to engage with the reading task, are elicited when reading in the presence of a therapy dog. More importantly, our study is unique in that it extends the theory of motivation and learning, as we propose that within the canine-assisted reading context, therapy dogs might elicit both implicit and explicit motives. In this research study, young participants' implicit and explicit motives were elicited, as measured through both non-declarative measures of reading persistence (i.e. time spent reading and task continuation) and declarative measures of reading motivation (i.e. self-perceive reading motivation and persistence). Moving forward it may be relevant to use a more unified framework, such as Gee and colleagues' (2017) unified framework, when exploring the canine-assisted reading context. Our study supports the use of such a framework, as our findings support the application of the premise that increasing motivation is a potential pathway that AAIs impact learning to the context of canine-assisted reading.

### **Study Limitations and Future Research Directions**

The current study explored the potential of therapy dogs as motivational reading buddies for young readers in the context of a challenging reading task. This research presents unique findings and should be considered as a proof of concept to be deliberated by for future research. However, the limitations of the present study should be reviewed.

These limitations are discussed in the following section.

**Location.** Unlike most canine-assisted literacy studies, this research was not conducted in a school or a library environment. Rather, the children in this study read to the therapy dogs in a controlled private space with fewer distractions that might arise than in a public space. Still, it is assumed that findings from this research are relevant to these different canine-assisted reading contexts. Results that accrue to this specific context may also be generalizable to the various complex ecologies children are exposed to in animal-assisted reading programs in schools and libraries. The private space allowed us to control for various external factors, but we assume that the findings would be similar in a different reading environment. Children's self-perceived competence, self-perceived interest in the reading task and the time spent reading to the therapy dog would be greater in the presence of a therapy dog regardless of the location in which the child was reading. One reason for this is that children were still placed in a challenging context in which it would be beneficial, if not necessary, to have a therapy dog present.

**Type of dog.** While dogs are an important part of children's ecology and our study results suggest that they may help young readers, an important distinction should be made between certain types of dogs. Indeed, it should be noted that our study exclusively included trained therapy dogs. These results may not be generalizable to canine-assisted reading interventions that do not use therapy dogs. As such, this research does not suggest that reading to your family pet or any other canine companion animal will induce similar outcomes on reading motivation and persistence. Further research needs to be conducted to elucidate the effects of different types of dogs on reading outcomes. This question is closely related to the behavioural interactions between the child and the dog.

When reading with companion animals, it is possible that children may be easily distracted from the reading task if they are familiar with the animal. Moreover, if the child is familiar with the dog in question or with the type of dog more generally, he or she is likelier to interact with it. The question becomes whether increased interactions with the dog are beneficial for literacy growth during canine-assisted reading interventions. Arguably, the answer to this question would be no if the dog in question is not suited to provide the calm, welcoming environment that therapy dogs provide.

**Book topics.** One of the limitations of this research is the lack of control for the topic of books children were assigned. Although procedures were carefully planned and followed to select developmentally appropriate reading passages for each reading level, no measures were taken to choose books of the same reading topic. The reading topic is a factor that can influence children's reading motivation during a challenging reading task (Fulmer and Frijters, 2011). Consequently, our results may be influenced by the choice of reading passages for children. This would have been particularly problematic if we were analyzing children's reading motivation with a between-subjects design, as not all participants were assigned a reading passage of the same difficulty. However, given that we used a within subjects design the topic of the book was less relevant to our study. To a certain extent, the topic of the stories assigned to each child was controlled for, as participants read the same story or similarly themed stories in both reading contexts (i.e. with or without a therapy dog present). However, future research should consider controlling for the theme of the books chosen. Specifically, it may be relevant to provide children with a choice of topic for the reading task. As interest in the topic of a story has been demonstrated to be related to motivation and persistence during a challenging

reading task (Fulmer & Frijters, 2011), controlling for the book topic, or participants' level of interest in the book topic, might be essential to accurately assess the impact of the presence of a dog in canine-assisted reading activities. If participants are equally interested in the reading task than individual differences in self-perceived enjoyment of the reading experience with or without the presence of a dog may more accurately reflect motivational components related to the canine-assisted reading context. Therefore, future studies should consider providing children with a choice of book topics to parse the impact of children's interest in the reading task due to the book topic and interest in the reading task due to the presence of a dog.

**Reading audience.** Another important element to consider is the environment in which the child is reading. On the basis of Levison's theory (1987), the accepting environment that the dog provides is fundamental to children's inclination to take risks. In this study, children always read in the presence of two humans: the therapy dog handler and an observing research assistant. It should be noted that because each participant read in the presence of these same two individuals in both contexts, their presence should not have affected the results of our study. However, this context may have been daunting, and more stressful for children than they had anticipated. In fact, one child reported that she did not anticipate having to read to so many people and that reading in front of other people made her want to perform better. The presence of two individuals might be considered added stressors for the child, potentially generating increased perceptions of judgment for the child. However, despite the increased stress of reading in the presence of two adults, the presence of the therapy dog might have created a micro non-judgemental environment within a more complex system/setting to which

participants were exposed. Because children were reading in the presence of two individuals, the reading context was not completely non-judgmental when the child was reading in the presence of the therapy dog. This is interesting because not only does it imply that therapy dogs create a micro-environment of acceptance for the struggling children, but also that the presence of a therapy dog might help to mitigate any perceived challenges associated with this unique situation; in this way, the children still reported being more interested in the reading task, feeling more competent when reading, and they also tended to persist longer in this reading context. In this way, it could be argued that the impact of the therapy dog goes beyond just providing a sense of overall acceptance, and that it creates a reading context that supports positive reading motivation and persistence. Evidently our context is unique to this study and it does not represent the reality of what happens in all canine-assisted reading programs. However, it is still comparable to reading contexts of typical canine-assisted reading interventions. Our study recreated a challenging reading context in which it may be necessary to provide a canine reading buddy. As this type of intervention assumes that reading is a challenging context, it is important to assess the impact of a therapy dog on children's reading behaviours when faced with a reading challenge.

**Sample size.** Although the target number of 20 participants was not attained, we nevertheless collected data from a sample of 17 children. This sample size was sufficient for a proof of concept study with a repeated-measures design. Moving forward it would be important to increase the sample size if one were to replicate this study on a larger scale to assess and compare results of specific populations such as struggling readers, reluctant readers, or young people with learning disabilities.

**Persistence effect.** We did not track how long children stopped reading during sessions. However, most children were noted to be highly focused on the reading task, as presented in the results, and did not pause while reading. If children stopped reading the research assistant would stop the timer and ask the child if he or she was done with that reading passage. If the child said no, the research assistant was instructed to restart the timer and allow the child to continue reading. If the child said yes, the research assistant would take away the reading passage, but would still provide the child with the opportunity to read the second part of the story. In our study, most children kept reading and the persistence measure involved a measure of continuous reading time. Future research might consider video recording the reading sessions to revise accuracy of timing. On a related note, while the majority of the data for this research was collected by the primary investigator, some data was collected by research assistants. However, all research assistants were trained by the primary investigator

**Unrealistic sense of competence.** Note that it was beyond the scope of this proof of concept study to measure actual growth of reading skills among the children. However, the findings from this study suggest that reading in the presence of a therapy dog increases children's perceived reading competence, and if this were to be the case in the absence of actual gains in reading competence this might induce an unrealistic sense of competence. Individuals that misjudge their abilities may repeatedly put themselves at high risk to engage in activities that may produce detrimental consequences if the performance is lacking (Bandura, 1997, p.163). While this may seem dangerous, in the reading context there is evidence suggesting that a slightly unrealistic sense of competence is protective of reading engagement (Bandura, 1997). Indeed, if children



have strong beliefs in their abilities they are more likely to approach a difficult task as a challenge to be mastered. They are more likely to have a positive orientation towards the activity, as aversive elements are considered a price to pay to attain mastery. These resilient children engage stronger levels of effort and commitment to the task, even in the face of failure or struggle. They quickly regain positive perceptions of their abilities after failure, as the latter is more likely to be attributed to a lack of effort (p.39). Also, when academic abilities are controlled for, one's perceived ability to accomplish a task is predictive of persistence and success (p.239). In this way, even if beliefs may be unrealistic, inducing positive self-concept is beneficial for children's literacy learning as it creates resiliency to the obstacle and promotes engagement to overcome the challenge associated with the task (p.37).

**Physical contact.** This study did not control for the physical interactions between the child and the therapy dog. On the basis of findings by Levinson (1987), petting an animal can have a beneficial impact on a child's sense of being accepted and his or her inclination to take risks. However, our research suggests that the physical contact was not essential to induce positive benefits. In fact, although some children in our study occasionally glanced at the therapy dog during the reading task, very few physically engaged with the therapy dog by petting it. Given that this study only entailed one reading session with a therapy dog, perhaps children were not as comfortable physically engaging with a dog that they had just met. Alternatively, observer reports suggest that children were very much engaged with the challenging reading task, which might explain why children's focus was turned away from the therapy dog. Interestingly, the therapy dog did not provide an alternative focus of attention for the child, as theorized by

Levinson (1987). As children struggled to perform well when asked to read out loud in front of the dog handler and an observer, their focus was not on the therapy dog but rather on the story. These findings suggest that perhaps the mere presence of the therapy dog was enough to increase children's reading motivation and their reading persistence. As opposed to canine-assisted therapy interventions in psychological and medical situations, physical contact with the animal may not be elemental to produce positive reading outcomes for children in a canine-assisted reading intervention.

**Measuring child-animal attachment.** One element that this study failed to draw more attention to is the child-animal bond and how attachment to the dog might impact the canine-assisted reading context. Given that learning is enhanced when it occurs in meaningful relationships (Purewal et al., 2017), and dogs can act as reading facilitators in the canine-assisted reading context (Clark, 2003), it would be relevant to explore the socio-emotional implications of the child-animal bond in the canine-assisted reading context. Specifically, future research should measure child-animal attachment to better understand how children's emotional attachments to their canine reading facilitators might impact their reading experience and their reading outcomes.

Measuring child attachment was beyond the scope of this research, however the observers in this study noted how the children interacted with the therapy dogs upon their introduction. While many of the children were excited to meet the therapy dog, a select few kept a safe and respectful distance upon introduction. One participant in our study was also disappointed about which therapy dog was present in the dog reading context, preferring to read to a larger dog. This preference was not further explored as it was beyond the scope of our research. However, future research should explore how different

dogs used in canine-assisted reading activities might increase children's interest and motivation to read through the emotional attachments that are formed between the child and the dog. Such a line of inquiry would be particularly fruitful because research has suggested that emotional attachments with animals might be associated with increases in children's implicit motives to read (Wohlfarth et al., 2013) and this may extend to read in the presence of a dog.

**Colinearity of outcomes.** We tested the colinearity of our three outcome variables to see if each one was uniquely contributing to the model. Results indicated that self-perceived competence and self-perceived interest scores were strongly correlated. As such, these two outcomes do not uniquely contribute to the model. This finding is unfortunate but not completely surprising. Although these two constructs are conceptually unique, they may develop in a similar way as children are learning to read. As such, while they are different, it may not be relevant or necessary to explore both constructs. An argument could have been made to either combine the two motivational outcomes or to choose only one construct to test the model. Additionally, self-perceived interest and the log of time scores were moderately correlated. This is not completely surprising either as it seems reasonable that if children are interested in a reading task, regardless of the difficulty, then they will persist longer. On the other hand, self-perceived competence and log of time spent reading were not significantly correlated. This may suggest that self-perceived interest in the reading task may be more indicative of reading persistence than self-perceived competence. Although a child may not feel competent when reading a struggling reading task in the presence of a therapy dog, he or she may be interested in the story, and the latter is more likely to be related to an increase

in the time spent reading. Taken together, future research should consider only including self-perceived competence and the log of time spent reading for a similar study.

Alternatively, it may be interesting to explore other motivational constructs such as beliefs about reading, attitudes towards reading, or performance goals, depending on the developmental age of participants.

**Considering longitudinal implications.** An avenue that should be explored in future research is the longitudinal effect of the presence of a therapy dog on children's reading motivation and persistence. Our study did not explore the impact of the presence of a therapy dog throughout the duration of a program. Given that many canine-assisted reading interventions are organized as programs, it would be beneficial to explore the long-term implications on children's reading motivation to determine if positive differences in reading motivation can be sustained. Presumably, there may be a novelty effect on reading motivation when children start reading to dogs. There is a need for greater insight into the development of reading outcomes, particularly motivation constructs, over time. Also, such research may help corroborate findings by Kirnan and colleagues (2017) on the long-term implications of engaging in canine-assisted reading interventions on reading achievement scores. Moreover, mapping children's motivational trajectory may help to uncover the process by which canine-assisted programs help support children through the process of learning how to read. In turn, this research could inform organisations that have canine-assisted reading programs on how to develop gold-standard interventions and provide services for a unique clientele of young readers. Potentially, future research could target struggling readers, reluctant readers, or readers with a learning disability.

**Exploring specific motivation constructs.** A particular strength of this proof of concept study is the defining of motivation constructs. With confusion between motivation constructs within the reading motivation literature in general, there is a call for researchers to define the motivation constructs that they are using in their research (Conradi, Jang & McKenna, 2014). The field of canine-assisted literacy is not exempted from this confusion. Indeed, research to date simply uses reading motivation as an umbrella term to explore various, unique motivation constructs. As such, this study both corroborates anecdotal findings on increased reading motivation and contributes unique and novel details about some of the motivation constructs that are impacted by the canine-assisted reading context. Future canine-assisted reading research on reading motivation should be informed about which constructs are most relevant to the sample being tested and should use standardized measures to further corroborate parent and teacher reports of increased reading motivation in students.

**Considering the home reading environment.** There is a solid base of evidence attesting to the positive impact of dogs on reading outcomes in school-based or educational contexts. However, as outlined by Purewal and colleagues (2017), pet ownership has not been investigated as a factor that may possibly be affecting academic outcomes. However, given that learning occurring in meaningful relationships is optimal and pet ownership often involves important relationships between the companion animal and the individual, it would be valuable for future research to explore how children's attachment to their dog reading buddy might affect the canine-assisted reading context. Moreover, based on the theory of motivation and learning by Wohlfarth and colleagues (2013), dogs in the canine-assisted reading context would provide children the

opportunity to form an attachment to their canine reading buddy, by emanating a sense of protection and safety. Such attachment and sense of protection and safety may already be inherent in the presence of a child's own companion animal. As such benefits might accrue more specifically to children who read to their pets at home. If development occurs most efficiently within meaningful relationships, reading to the family dog might be more beneficial than reading to a therapy dog in a school or in a library environment if the child shares an attachment to their own dog. Future research should investigate the implications of a canine-assisted reading context in a home environment and elucidate the implications on children's reading outcomes. While companion animals may not all have similar temperaments to trained therapy dogs, they might still contribute something important to children's reading experience and this context and the microenvironment created is worthy of further investigation.

### Conclusion

This proof of concept study contributes to the burgeoning research on canine-assisted reading by addressing several gaps in the literature. First, to the best of our knowledge this study is the first to use a within-subjects design to explore children's reading motivation and reading persistence during a canine-assisted reading task. Second, this study is unique in that children were assigned developmentally appropriate stories but the passages were carefully selected to be challenging. The challenge presented by the reading task was greater than a typical, pleasurable reading activity. The decision to present a difficult reading context helped to detect smaller differences between the two reading conditions. Moreover, presenting the children with a reading challenge allowed us to explore the impact of the presence of a therapy dog in a context that is most relevant to the need of having a therapy dog present. Canine-assisted reading interventions assume that children will benefit from an animal companion to help improve their reading skills. That being said, the reading context is one that presents challenge to the child. This "naturally challenging reading context" was carefully recreated in this study to determine if the presence of a therapy dog would have a positive impact on children's reading motivation and persistence.

Drawing on research on canine-assisted reading interventions, the purpose of this proof of concept study was to determine if therapy dogs might facilitate a context conducive to reading for children when they are faced with a challenging reading passage. Toward this objective, this study used a within-subjects design and assessed children's motivation to read in both a reading context with a therapy dog and without a therapy dog. Reading motivation was determined through two unique motivational

constructs, self-perceived reading interest and self-perceived reading competence.

Reading persistence was determined through task continuation and time spent reading.

Our study results showed that the presence of a therapy dog had a positive impact on children's reading motivation and persistence when faced with a challenging passage. Specifically, the children in this study confirmed feeling more interested and more competent when reading in the presence of a therapy dog, and these results were statistically significant. Additionally, the children spent more time reading in the presence of the therapy dog. This proof of concept demonstrates the particularities of the canine-assisted reading context and its implications for young readers are worth exploring on a larger scale. It can henceforth be used as a point of comparison for future studies.



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## Appendices

### Appendix A: Certificate of Ethics Clearance



Brock University  
 Research Ethics Office  
 Tel: 905-688-5550 ext. 3035  
 Email: reb@brocku.ca

Social Science Research Ethics Board

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#### Certificate of Ethics Clearance for Human Participant Research

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DATE: 9/19/2017  
 PRINCIPAL INVESTIGATOR: TARDIF-WILLIAMS, Christine - Child and Youth Studies  
 FILE: 17-026 - TARDIF-WILLIAMS  
 TYPE: Masters Thesis/Project STUDENT: Camille Xinmei Rousseau  
 SUPERVISOR: Christine Tardif-Williams  
 TITLE: Participating in a Canine-assisted Reading Program: Implications for Children's Reading Motivation and Persistence

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#### ETHICS CLEARANCE GRANTED

Type of Clearance: NEW

Expiry Date: 9/1/2018

The Brock University Social Science Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from 9/19/2017 to 9/1/2018.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 9/1/2018. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at <http://www.brocku.ca/research/policies-and-forms/research-forms>.

In addition, throughout your research, you must report promptly to the REB:

- a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
- c) New information that may adversely affect the safety of the participants or the conduct of the study;
- d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved:

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Ann-Marie DiBiase, Chair  
 Social Science Research Ethics Board

**Note:** Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

## Appendix B: St. John Ambulance Approval Letter

Ladies and Gentlemen,

My name is Suzi Peters and I am the Coordinator of the St. John Ambulance's Therapy Dog Program at the Niagara Region, and Lori Thwaites is the Coordinator of 'Paws Reading Club' Dog Therapy Program for our area.

St. John Ambulance is a non-profit organisation whose teams of handlers and dog volunteers work with the vulnerable sector throughout Ontario. We maintain a positive, professional and necessary footprint.

SJA was founded to improve the lives of physically, cognitively, emotionally, and socially disadvantaged individuals through our 'Paws Reading Club' Dog Therapy Program reading program, and with regular visitations and therapeutic relief programs. Working closely with caseworkers, coordinators, teachers, caregivers, and parents our teams integrate themselves into programs to enhance what is already being implemented in similar organisations.

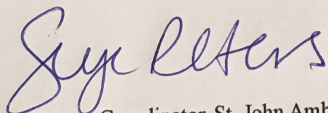
'Paws Reading Club' Dog Therapy Program reading program is an after school program that will be running on Friday evenings in October and November at the St. John Ambulance.

We are very pleased to be partnering with Brock University for this prospective upcoming research study and are anxious to work in tandem with Christine Tardif-Williams PhD, Associate Professor in the Department of Child and Youth Studies.

We know that our work with Christine and her colleague, Camille Xinmei Rousseau (research assistant), will be beneficial to both parties. The results of this research will be invaluable for St. John Ambulance, and will allow us to continue gaining momentum and enhancing our programs in a positive and meaningful direction.

Should you need to contact me for any reason, please do not hesitate. I can be reached at any of the contact information above.

We, at St. John Ambulance, look forward to working with you and continuing this partnership in any way that is suitable beyond the scope of this particular endeavour.



Suzi Peters, Coordinator St. John Ambulance Therapy Dogs, Niagara Region

[drsuzi@sympatico.ca](mailto:drsuzi@sympatico.ca)

Lori Thwaites, Assistant Coordinator St. John Ambulance 'Paws Reading Club', Niagara Region

Appendix C: Recruitment Flyers



# Paws Reading Study



A Brock University and St. John Ambulance Research Initiative

Research Ethics Board File #17-026 -TARDIF-WILLIAMS

## WHO?

Children in grades 1 to 3

## WHEN?

One hour on a Friday  
or a Wednesday evening  
Between 4:30 and 7:00 pm  
October – December, 2017  
You pick your time slot!

## WHERE?

St. John Ambulance  
219 Church St  
St. Catharines, ON L2R 3E8

## INVALUABLE OPPORTUNITY!

Join this exclusive opportunity and read to the St. John Ambulance Therapy dogs! Your participation in this study will help us better understand the impact of canine-assisted literacy activities. Takes no more than one hour!

## WANT TO KNOW MORE?

Contact us!

Camille Xinmei Rousseau  
cr16uc@brocku.ca

Dr. Christine Tardif-Williams  
ctardifwilliams@brocku.ca

**1 in 10 chance of winning \$25 if you participate!**

## Appendix D: Invitation Letter and Consent Form

**Invitation and Consent Form for Parents**

Date: December 11, 2017

Study Title: Participating in a Canine-Assisted Reading Study: Implications for Children's Reading Motivation and Persistence.

Principal Investigators: Dr. Christine Tardif-Williams, Associate Professor, Department of Child & Youth Studies, Brock University, Ontario, (905) 688-5550 x4557 [ctardifwilliams@brocku.ca](mailto:ctardifwilliams@brocku.ca) and Camille Xinmei Rousseau, Master's student, Department of Child and Youth Studies, Brock University, Ontario (613)-866-6715 [cr16uc@brocku.ca](mailto:cr16uc@brocku.ca)

*INVITATION*

You and your child are invited to participate in a study that involves research. The purpose of the study is to examine the connection between engaging in animal-assisted literacy and the influence that it may have on a child's reading motivation and reading persistence. Research shows that animal-assisted literacy programs help increase academic achievement and reading skills by increasing reading motivation (Hall, Gee, & Mills, 2016). By providing a non-judgmental environment and positive reading experiences, these programs are said to help children overcome the struggles associated with reading, to increase children's reading motivation, and to help improve children's reading abilities (Hall, Gee, & Mills, 2016). However, little is known about how the context of canine-assisted literacy can help increase children's motivation to read when they are confronted with a challenging reading passage. This study's results will potentially inform animal-assisted literacy programs on the benefits of engaging with challenging passages through canine-assisted reading on children's reading motivation and reading persistence.

*WHAT'S INVOLVED*

You are invited to come to the St. John Ambulance (219 Church St, St. Catharines, ON L2R 3E8) with your child to participate in research study on animal-assisted literacy. On this day we ask you to sign the consent form if they have not been completed. We will be happy to address any remaining questions or concerns about the study. Upon your consent and your child's assent we will invite your child to complete a couple brief and non-invasive reading assessments. For one of the assessments, we will observe your child as he or she reads and we will silently take notes. The total time anticipated to complete the assessments is maximum one hour. We will offer your child the option of providing verbal responses to the questionnaires. Note that all verbal responses will be individually audio recorded in a quiet and separate space within the school; this will facilitate the process of accurately recording children's responses to the questions.

Data collection will be held by appointment on January 3<sup>rd</sup> and 5<sup>th</sup> from 4:30 pm until 6:30 pm. You will be invited to choose a time slot for your child's reading session. You will be asked to complete a short and non-invasive questionnaire. The total time anticipated for the set of questionnaires is approximately 20 minutes at each time period and these can be completed while you are waiting for your child.

*POTENTIAL BENEFITS AND RISKS*

Participation in this study will help to clarify the important contribution that *St. John Ambulance*, and similar programs, can offer to the educational community. Results from this study will allow us to take a step forward in contextualizing the instances in which young children's reading motivation increases, and the implications of such increases on children's reading persistence. Specifically, the study will inform us on benefits of engaging in canine-assisted reading programs on children's reading motivation and achievement. Additionally this research will potentially contribute to a better understanding of how to develop educational resources that draw on relationships with companion animals to increase children's reading motivation and persistence. The results might also help to guide and support psycho-educational programs that engage animals.

There is a very small risk that your child might experience some emotional distress when reading to the animal for the first time. However, we do not anticipate this distress to be any greater than what your child might encounter in the context of their family and peer-based reading experiences. Just prior to beginning this study, your child will be verbally reminded that his/her participation in this study is completely voluntary, that he/she does not have to answer any questions that he/she feels uncomfortable about and that he/she is free to withdraw from the study at any time, without any penalty.

We do not anticipate that you will experience any potential risks from participating in this study that add to (over and above) those that you would experience as a result of any greater than what your child might encounter in the context of their, school-, family-, and peer-based reading experiences.

*CONFIDENTIALITY*

All questionnaire and interview responses (both written and audio recorded) provided by you and your child will be kept strictly confidential. Access to this data will be restricted to the principal investigator (Dr. Christine Tardif-Williams), the principal student investigator (Camille Xinmei Rousseau), and the research assistants under Dr. Christine Tardif-Williams' supervision. Data collected during this study will be stored in a secure and locked filing cabinet in Dr. Christine Tardif-Williams' office at Brock University. Names will not appear in any written report or oral presentation resulting from this research study; only group results will be reported in all oral and written presentations or publications of this research. All data including audio files and questionnaire data will be kept for one year for analysis and publication of the data, and then confidentially destroyed and/or shredded following the completion of this research study (estimated date: December, 2019).

*VOLUNTARY PARTICIPATION*

Participation in this study is voluntary. Both you and your child may decline to participate in any component of this research study at any time. Your decision to not participate, or to withdraw, will not impact your child's participation in study. You may withdraw your consent up until the time when the data is published or until the master list of identifiers is destroyed. All data will be immediately destroyed if you decide to withdraw your child's consent, or if your child decides to withdraw his/her participation in this study at any time. Neither you nor your child will experience any penalty from withdrawing his/her participation in this study.

*INCENTIVE*

Your child will receive stickers after completing the study. Your participation will give you the opportunity to enter a draw. You are under no obligation to enter the draw. You may opt-out of the draw should you decide to do so at any time. The prize of the draw will be a \$50 gift card at Chapters/Indigo. There will be one gift-card drawn with odd of winning being approximately 1 in 25. The gift-card will be drawn at then end of the study (December). We will contact you by email about the results of the draw. Please note that if you choose to withdraw from the study you will still be given the option of having your name entered into the draw.

*PUBLICATION OF RESULTS*

The results of this study will be published in the form of oral presentations at both academic and community and school-based conferences and as written manuscripts in peer-reviewed journals and within appropriate school newsletters/websites. If you like to receive a copy of this study's results, please provide your email address and a feedback letter outlining this study's results will be emailed to you upon completion of this research study (estimated date: August, 2018).

*CONTACT INFORMATION AND ETHICS CLEARANCE*

If you have any questions about this research study or require further information, please contact the principal investigator Dr. Christine Tardif-Williams using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file #17-026 -TARDIF-WILLIAMS). If you have any comments or concerns about your child's rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

*CONSENT FORM*

I agree to participate in the research study described above. I agree to allow my child's participation in the research study described above. I have made this decision based on the information I have read in the Invitation Letter and this Consent Form. I have had the opportunity to receive any additional details wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time. I am also aware of the researcher's legal and ethical responsibility to report any suspected child abuse/neglect to the appropriate authorities.

I agree to participate in this study.

YES NO

I give permission for my child to participate in this study.

YES NO

I give permission for you to audio record my child's verbal responses.

YES NO

I would like to receive a feedback letter outlining this study's results, via mailing address or e-mail.

YES Mailing address or E-mail Address:

---

I give permission for you to contact me in the future to inform me about opportunities to take part in a follow-up or related research study.

YES NO

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Thank you for your assistance in this research study. Please keep a copy of this form for your records.

Christine Tardif-Williams, Associate Professor, Department of Child & Youth Studies, Brock University, 905-688-5550 ext. 4557; [ctardifwilliams@brocku.ca](mailto:ctardifwilliams@brocku.ca)

## Appendix E: Verbal Script and Assent form for Minors

Child's Research Identification Number \_\_\_\_\_

**Verbal Script and Assent Form for Minors***The following script is to be read to the child participant prior to the beginning of the study.*

Hello, my name is Camille. I am doing a project for my school, Brock University. My project is on reading activities. I would like your help with some questions and activities. Would you like to help me with the activities?

If you say yes, it will take no more than one hour do to all the activities. I will ask you a few questions. I will record your answers to make sure I don't miss anything important. There are also a couple stories I think you will find interesting. You will even be able to read one of the stories to a dog. While you read or my assistant will be near you quietly listening and taking notes. You can say no at any time if you don't want to do this.

Your help with these activities will help us understand how dogs can help children read. It could also help us create more activities with dogs.

There should not be anything in this study that will make you feel bad. But if you do not want to answer a question you can always skip to the next question.

There are no right answers to any of the questions and your answers will be a secret. No one will find out your answers to questions. After this project is done all your answers will be destroyed. No one will ever see your personal answers except my supervisor, my assistant and me.

You do not have to be in this project. Your participation in this project is completely voluntary. No one will be upset with you if you choose not to be in this project and you can choose to stop being in this project at any time. You can ask me questions now, or at any time during the activities.

Would you like help me with my project?

Child's name, printed:

\_\_\_\_\_ Date: \_\_\_\_\_

Signature of the research assistant or principal investigator (or co-investigator):

\_\_\_\_\_ Date: \_\_\_\_\_



Appendix F: Measures

Pre-Test Individual Interview with Children  
Post-Test Individual Interview with Children  
Intrinsic Motivation Inventory - Reading  
Observer Checklist of Child Reading Behaviours  
Woodcock Johnson III Test of Achievement (WJIII)  
Parent Observations of Child Reading Behaviours

## Pre-Test Individual Interview with Children

## Beginning of the Study

Say: Hello, my name is \_\_\_\_\_. What is your name? Hello \_\_ (Name of child)\_\_. I have some questions about Mecho and her friends. I think you would be great at answering them. There is no wrong answer and you can say no if you don't want to help me. Do you mind helping me answer my questions? Is it ok if I audio-record what we talk about?

1. How old are you, \_\_\_name of child\_\_\_?
2. When is your birthday?
3. What grade are you in?
4. Do you like to read? Can you tell me why you like or do not like to read?
5. Do you like to read new books or old books?
6. Do you like reading out loud?
7. Do you prefer to read alone or with someone? (If someone, who do you like to read with?)
8. Do you read at home with your parents? (If yes: do you enjoy reading with your parents? How often do you read to your parents?)
9. Are you excited about reading to the dogs today? Have you read to dogs before (where, when)?

Stop recording.

Thank you for answering all my questions, \_\_\_(name of child)\_\_\_! You did a great job!  
Let's go back and see your friends!

## Post-Test Individual Interview with Children

## Beginning of the Study

Say: Hello, my name is \_\_\_\_\_. What is your name? Hello \_\_ (Name of child)\_\_. I have some questions about the Mecho and her friends. I think you would be great at answering them. There is no wrong answer and you can say no if you don't want to help me. Do you mind helping me answer my questions? Is it ok if I tape-record what we talk about?

1. What did you think about \_\_\_\_ (name of dog)\_\_\_\_?
2. Did you like reading to \_\_\_\_ (name of dog)\_\_\_\_?
3. What was the best part about reading to \_\_\_\_ (name of dog)\_\_\_\_?
4. Is there anything that you don't like about reading to \_\_\_\_ (name of dog)\_\_\_\_?
5. Would you like to read to \_\_ (name of dogs)\_\_\_\_ and her friends next year if you had the chance?
6. Now think of when you were reading the story on your own, without the dog. Did you like reading on your own?
7. What was the best part of reading on your own?
8. Is there anything you didn't like about reading on your own?
9. Did you prefer reading with the dogs or without the dogs? Can you tell me why?
10. What did you think of the stories you read today? (Prompt if necessary: Did you like them? Where they easy or hard?)

Stop recording.

Thank you for answering all my questions, \_\_\_\_ (name of child)\_\_\_\_! You did a great job!  
Let's go back and see your friends!

## Intrinsic Motivation Inventory – Reading

## Interest

Overall, I enjoy reading stories.

Story reading is fun to do.

I would describe story reading as interesting.

I think story reading is enjoyable.

When I read stories, I think about how much I enjoy it.

I like reading stories.

I read stories for fun.

If I could choose what to do right now, I would read a story.

## Competence

I think I am good at reading stories.

I think I read stories well.

After working on a story for a while, I feel skilled.

I feel good about how well I can read stories.

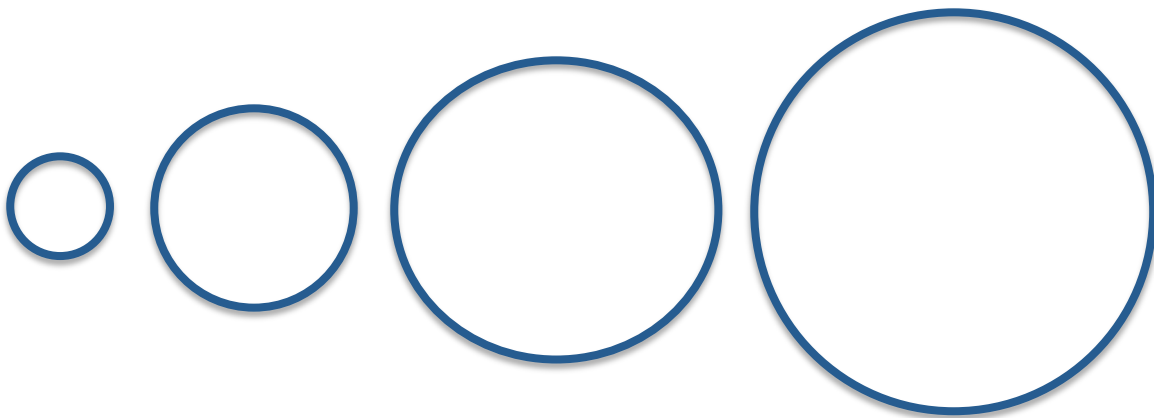
I am skilled at reading stories.

Reading stories is an activity that I can do well.

When I choose a story to read, I can read it easily.

I am a good story reader.

\* Note: The statements listed above will be verbally presented to the children participating in the study. Participants will be invited to respond by indicating a size of circle (one of four) that best represents the magnitude with which they agree with the statement.



## Observer Checklist or Child Reading Behaviours

Child's Research Identification Number \_\_\_\_\_

**Observer Checklist of Child Reading Behaviours (ALONE)**

1. Does the child want to read today?    YES    NO
  
2. How would you describe the child's reading engagement with the story?  

Very Engaged	Somewhat Engaged	Neutral	Not Very Engaged	Not At All Engaged
5	4	3	2	1

 Did he/she seem distracted? YES    or    NO if so, by what? \_\_\_\_\_  
 \_\_\_\_\_
  
3. Does the child appear to enjoy reading alone?  
 YES    or    NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
  
4. Does the child appear confident reading alone?  
 YES    or    NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
  
5. Is the child struggling with the reading passage?  
 YES    or    NO  
 If so, How do the address the struggle? \_\_\_\_\_  
 \_\_\_\_\_
  
6. Does the child appear motivated when reading alone?  
 YES    or    NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
  
7. Did the child's reading improve noticeably over the period of this reading session?  
 YES    NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
  
8. Did the child wish to continue reading to the dog when given the opportunity?  
 YES    or    NO
  
9. Where did they stop reading? \_\_\_\_\_
10. Why they stopped reading? \_\_\_\_\_
11. Time read to the dog: Part 1: \_\_\_\_\_ minutes                      Part 2: \_\_\_\_\_ minutes

Child's Research Identification Number \_\_\_\_\_

**Observer Checklist of Child Reading Behaviours (WITH DOG)**

12. Does the child want to read to the dog? YES NO
13. Did the child engage with the dog when introduced? YES NO
14. How did the child react to the dog when introduced at this session?  
 FEARFUL ANXIOUS DISINTERESTED EXCITED
15. Reading engagement with the dog at this session:  
 Very Engaged Somewhat Engaged Neutral Not Very Engaged Not At All Engaged  
 5 4 3 2 1  
 How did the child engage with the dog (e.g. petting, looking, talking, etc.)? \_\_\_\_\_
16. Reading engagement with the story:  
 Very Engaged Somewhat Engaged Neutral Not Very Engaged Not At All Engaged  
 5 4 3 2 1  
 Did he/she seem distracted from the reading task? YES or NO  
 If so, by what? \_\_\_\_\_
17. Does the child appear to enjoy reading to the dog at this session?  
 YES or NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
18. Does the child appear confident reading to the dog?  
 YES or NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
19. Is the child struggling?  
 YES or NO  
 If so, How do the address the struggle? \_\_\_\_\_  
 \_\_\_\_\_
20. Did the child's reading improve noticeably over the period of this reading session?  
 YES NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
21. Does the child appear motivated when reading with the therapy dog?  
 YES or NO  
 If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_
22. Did the child wish to continue reading to the dog when given the opportunity?  
 YES or NO
23. Where did they stop reading? \_\_\_\_\_
24. Why they stopped reading? \_\_\_\_\_
25. Time read to the dog: Part 1: \_\_\_\_\_ minutes Part 2: \_\_\_\_\_ minutes

Woodcock Johnson III Tests of Achievement

Although there are many subtest of the Woodcock Johnson III, we only used two of the subtests: Test 1: Letter-Word Identification and Test 13: Word Attack.

**STANDARD BATTERY**

**Test 1 Letter-Word Identification**

*Basal: 6 lowest correct*  
*Ceiling: 6 highest incorrect*

Score 1, 0

1	___ L	57	___ acrylic
2	___ A	58	___ chromosome
3	___ W	59	___ apostrophe
4	___ S	60	___ precipitate
5	___ I	61	___ apparatus
6	___ Y	62	___ reminiscent
7	___ R	63	___ italicized
8	___ N	64	___ psychosis
9	___ K	65	___ debris
10	___ red	66	___ paraphernalia
11	___ P	67	___ municipality
12	___ Q	68	___ melodious
13	___ t b	69	___ subsidiary
14	___ U	70	___ euphemism
15	___ see	71	___ trichinosis
16	___ the	72	___ facetious
17	___ is	73	___ phonemic
18	___ and	74	___ ignominious
19	___ go	75	___ tricot
20	___ will	76	___ gouache
21	___ not		
22	___ but		
23	___ from		
24	___ had		
25	___ keep		
26	___ said		
27	___ with		
28	___ light		
29	___ their		
30	___ which		
31	___ would		
32	___ use		
33	___ together		
34	___ young		
35	___ point		
36	___ piece		
37	___ built		
38	___ however		
39	___ enough		
40	___ practice		
41	___ bought		
42	___ interested		
43	___ knowledge		
44	___ diagram		
45	___ investigate		
46	___ process		
47	___ thermostat		
48	___ authority		
49	___ audience		
50	___ impatient		
51	___ fiercely		
52	___ courageous		
53	___ astronomer		
54	___ leagues		
55	___ deliberately		
56	___ essential		

Number Correct (0-76)

Number Correct	AE (Est)*	GE (Est)*
0	<-2.0	<-K.0
1	2-0	<-K.0
2	3-0	<-K.0
3	3-8	<-K.0
4	4-2	<-K.0
5	4-5	<-K.0
6	4-8	<-K.0
7	4-11	<-K.0
8	5-1	K.1
9	5-3	K.2
10	5-4	K.2
11	5-8	K.3
12	5-8	K.4
13	5-9	K.5
14	5-11	K.6
15	6-0	K.7
16	6-2	K.8
17	6-3	K.9
18	6-4	1.0
19	6-5	1.1
20	6-6	1.2
21	6-7	1.2
22	6-8	1.3
23	6-9	1.4
24	6-10	1.5
25	6-11	1.5
26	7-0	1.6
27	7-0	1.7
28	7-1	1.8
29	7-2	1.8
30	7-3	1.9
31	7-4	2.0
32	7-5	2.1
33	7-6	2.2
34	7-7	2.2
35	7-8	2.3
36	7-9	2.4
37	7-10	2.5
38	7-11	2.6
39	8-0	2.7
40	8-1	2.8
41	8-2	2.9
42	8-4	3.0
43	8-5	3.1
44	8-6	3.3
45	8-8	3.4
46	8-10	3.5
47	9-0	3.7
48	9-2	3.8
49	9-4	4.0
50	9-7	4.2
51	9-10	4.4
52	10-1	4.6
53	10-4	4.8
54	10-8	5.1
55	11-0	5.3
56	11-4	5.6
57	11-8	5.9
58	12-0	6.3
59	12-4	6.7
60	12-9	7.1
61	13-1	7.5
62	13-6	8.0
63	14-0	8.5
64	14-6	9.1
65	15-1	9.8
66	15-9	10.6
67	16-6	11.6
68	17-5	12.7
69	18-4	14.1
70	19	15.4
71	20	17.3
72	21	>18.0
>72	>22	>18.0

\*AE and GE are estimates of the precise values provided by the software scoring program.

Research Identification Number: \_\_\_\_\_

EXTENDED BATTERY

**Test 13 Word Attack**

Basal: 6 lowest correct  
Ceiling: 6 highest incorrect

Score 1, 0

- 1 \_\_\_\_\_ points to rabbit
- 2 \_\_\_\_\_ /s/
- 3 \_\_\_\_\_ /m/
- A \_\_\_\_\_ nat
- B \_\_\_\_\_ ib
- 4 \_\_\_\_\_ hap
- 5 \_\_\_\_\_ mell
- 6 \_\_\_\_\_ fim
- 7 \_\_\_\_\_ ven
- 8 \_\_\_\_\_ jop
- 9 \_\_\_\_\_ floxy
- 10 \_\_\_\_\_ leck
- 11 \_\_\_\_\_ pawk
- 12 \_\_\_\_\_ distrum
- 13 \_\_\_\_\_ chur
- 14 \_\_\_\_\_ vorse
- 15 \_\_\_\_\_ gradly
- 16 \_\_\_\_\_ loast
- 17 \_\_\_\_\_ bighten
- 18 \_\_\_\_\_ wreet
- 19 \_\_\_\_\_ yerdle
- 20 \_\_\_\_\_ koodoo
- 21 \_\_\_\_\_ baunted
- 22 \_\_\_\_\_ splaunch
- 23 \_\_\_\_\_ gnobe
- 24 \_\_\_\_\_ centizen
- 25 \_\_\_\_\_ quog
- 26 \_\_\_\_\_ wrouch
- 27 \_\_\_\_\_ phintober
- 28 \_\_\_\_\_ hudned
- 29 \_\_\_\_\_ cythe
- 30 \_\_\_\_\_ cimp
- 31 \_\_\_\_\_ deptonlel
- 32 \_\_\_\_\_ querpostonious

Number Correct (0-32)

**Test 13 Word Attack Scoring Table**  
Encircle row for the Number Correct.

Number Correct	AE (Est)*	GE (Est)*
0	<3-8	<K.0
1	5-1	<K.0
2	5-9	K.3
3	6-3	1.0
4	6-9	1.4
5	7-0	1.6
6	7-2	1.7
7	7-4	1.8
8	7-5	1.9
9	7-7	2.1
10	7-8	2.2
11	7-10	2.3
12	7-11	2.4
13	8-1	2.5
14	8-3	2.7
15	8-4	2.9
16	8-6	3.1
17	8-8	3.3
18	8-11	3.6
19	9-2	3.9
20	9-6	4.3
21	9-11	4.7
22	10-4	5.1
23	11-0	5.5
24	11-8	6.1
25	12-6	6.7
26	13-5	7.5
27	14-4	8.6
28	15-5	10.2
29	16-11	12.9
30	>21	15.4
>30	>21	>18.0

\*AE and GE are estimates of the precise values provided by the software scoring program.



Parent Observations of Child Reading Behaviours

Child's Research Identification Number \_\_\_\_\_

Parent Observations of Child Reading Behaviours

Child's Research Identification Number \_\_\_\_\_ Gender: M F

Date of birth \_\_\_\_\_ Grade: 1 2 3

1. Does your child struggle with reading (fluency, rate, comprehension)? YES NO

If so, please explain \_\_\_\_\_

2. Do they get additional support to learn to read from a tutor or any other type of intervention? YES NO

If so, please explain \_\_\_\_\_

3. Do you read with your child regularly at home? YES NO

If so, how many times a week do you read with your child?

1x/week 2x/week 3x/week 4x/week 5x/week more than 5x/week

4. Is your child reading out loud in your reading sessions together? YES NO

5. How often does your child read alone silently at home?

Never 1x/week 2x/week 3x/week 4x/week 5x/week more than 5x/week

6. Does your child read spontaneously at home? YES NO

7. a) Does your family have a pet? YES NO

b) If so, does your child read with or to his or her own pet at home? YES NO

8. Do you have any other comments that you would like to share about your child's reading experience?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Thank you for participating!

## Appendix G: Reading Passages for Children

Grade	Lexile	Used	Book
<K		10	I like Fish/ Smick
K	25	40	Money and Me/ Tae Kwon Do!
1.1	50	50	The Blue Brook / Troy Waits for a Train
1.2	75	90	Dog's new Coat/ Fire! Fire! Said Mrs. McGuire/Pie for Chuck/ Oh, Cats! Teach us Amelia Bedelia
1.2	100	110	Biscuit / A new friend
1.3	125	130	Froggy and Fly: Six Slurpy stories
1.3	150	160	Biscuit goes to school/ Biscuit's new trick
1.4	175	180	Little Lizzard's big Party/ Can I play too? Tiny goes to the library / The Good Dinosaur: CRASH, BOOM, ROAR!
1.5	200	200	BOOM, ROAR!
1.6	225	240	Are you my mother?
1.6	250	260	Biscuit's day at the farm / Kit & Kat
1.7	275	290	Class Pet from the black lagoon/ Pete's big Lunch
1.8	300	300	The bike lesson
1.9	325	330	Franklin stays up / Cork & Fuz: Best friends
2	350	350	Sunset of the sabertooth
2.1	375	380	The hidden stairs and the magic carpet
2.1	400	400	Locked in the Library
2.2	415	420	Joe and Sparky Superstar!
2.3	425	430	Ant and Honey Bee
2.4	440	440	Fox on the Job
2.5	450	450	Amelia Bedelia
2.6	475	480	A birthday for Frances
2.7	500	500	Around the world / Poppleton in the spring
2.8	515	520	It's about Time Max
2.9	525	530	Zelda, Ivy and the boy next door
3	550	550	Summer of the sea serpent
3.1	565	570	Grin and bear it
3.2	575	590	The Great Kapok Tree/ Arthur turns green
3.3	600	600	The mitten / Marley Steals the Show
3.4	615	620	The year of Billy Miller
3.5	625	630	Falcon Quinn and the black mirror
3.6	640	640	Gauge
3.7	650	650	The Ironwood tree
3.8	665	670	Clementine, Friend of the week
3.9	675	680	The dragon in the sock drawer
4.0	690	690	Bless this Mouse
4.1	700	700	Where the red fern grows

4.2	715	720	The BFG
4.3	725	730	The book Thief
4.4	740	740	A Wrinkle in time
4.5	750	750	The Outsiders
4.6	760	760	The Giver
4.7	775	780	Nancy drew hidden staircase
4.8	785	790	To kill a mocking bird
4.9	795	800	Redwall
5	800	810	Where the Mountain Meets the Moon
5.1	815	820	The Dragon Prince
5.2	825	830	Frindle
5.3	835	840	Mathilda

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## Appendix H: Example of Reading Passage

**Cork and Fuzz: Best Friends (Lexile 330L) Part B**

“We could play catch-the-pinecone,” Cork said.

He picked up a stick.

He swung it at a pine tree branch.

A pinecone fell.

It landed on Fuzz’s head. *Thunk!*

Fuzz gasped.

Then he fell to the ground.

He did not move.

He did not move at all.

Fuzz lay very still on the ground.

Cork bent over and wiggled Fuzz’s tail.

Fuzz did not move.

Cork wiggled Fuzz’s nose.

He wiggled Fuzz’s foot.

Fuzz did not move.

Cork sat on the ground next to Fuzz.

Cork sniffled.

“I will stay here with you,” Cork said.

A butterfly landed on Fuzz’s ear.

“Shoo!” Cork said.

A grasshopper landed on Fuzz’s paw.

“Shoo!” Cork said.

A caterpillar crawled up on Fuzz’s belly.

“Shoo!” Cork said.

“Please do not be fainted much longer,”

Cork said.

Fuzz’s eyes popped open.

“I am not fainted,” Fuzz said.

“I was playing possum.”

**Cork and Fuzz: Best Friends (Lexile 330L) B (part 2)**

“Possum is not a fun game to play,”

Cork said.

“It is not a game,” Fuzz said.

“It is what possums do when they are afraid.

Something hit me on the head.

I was afraid.”

“It was a pinecone,” Cork said.

“A pinecone?” Fuzz said.

“I thought it was a giant buzzard bee.”

Fuzz pushed the pinecone with his toe,

Then he picked something up off the ground.

He put it under the pointed leaf.

“What was that?” Cork asked.

“Just a little nothing,” Fuzz answered.

“I can teach you to play pin-the-tail-on-the-turtle,” Cork said.

Cork found a long leaf.

He stuck a thorn in the end of the leaf.

“This is the turtle’s tail,” Cork told Fuzz.

“This is not a fun game for the turtle,”

Fuzz said.

“He has got a thorn in his tail!”

“No, no, no!” Cork said.

“This is a pretend tail!”

Cork gave the leaf to Fuzz.

“That stump is a pretend turtle.”

“Close your eyes.

Now stick the tail on the turtle.

I will find a leaf for me.”

Cork bent over to pick up a leaf.

“*Ee-yow!*” he yelled.

“Uh-oh,” said Fuzz.

“I am not a turtle!” Cork said.

“Do not stick the tail on me!”

“I am sorry,” Fuzz said.

He hung his head.

Then he picked something up off the ground.

He put it under the pointed leaf.

Cork stuck his nose against Fuzz’s nose.

“What are you hiding under that pointed leaf?” Cork said.

“Okay, I will show you,” Fuzz said.

“But you will think it is silly.”

Fuzz picked up the pointed leaf.

Under the leaf were three stones: a red stone, a white stone, and a shiny, black stone.

“I collect interesting stones,” Fuzz said.

At first Cork looked surprised.

The he laughed.

“I knew you would laugh,” Fuzz said.

“I will go home now.”

“No, no, no!” Cork said.

“I am laughing because I collect stones too!

Come to my pond!

I will show you my stones.”

“You live in a pond?” Fuzz asked.

“Yes,” said Cork.

“Like a duck!” Fuzz said.

“Ducks live in ponds.”

Cork picked up Fuzz’s stones.

“Come on,” said Cork, “and I will explain again about muskrats and ducks.”

“*Cork, cork,*” quacked Fuzz.