2014

Vocabulary and Reading Comprehension Intervention: A Focus on Students in the Late Elementary Grades

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VOCABULARY AND READING COMPREHENSION INTERVENTION: A FOCUS ON STUDENTS IN THE LATE ELEMENTARY GRADES

By

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THESIS

Submitted to the Department of Psychology

in partial fulfillment of the requirements for the

Master of Arts in Psychology

Wilfrid Laurier University

July, 2014

Abstract

Literacy skills are key to success in school, career, and everyday life. Despite school curricula being strongly focused on literacy development (Ministry of Education, 2006), many children continue to fall behind the expected literacy skill levels for their grade (Education Quality and Accountability Office, 2012a, 2012b; National Center for Education Statistics, 2011). The present study evaluated a literacy intervention, Better Reading for School Success (BRSS), accompanied by a parent/guardian literacy workshop and weekly tips regarding how parents and/or guardians can promote literacy skill development at home. The BRSS was also evaluated as a subsection of family literacy afterschool programs, 'Get Set Learn Afterschool' (GSLA; Kelland & Wasielewski, 2011) or 'Get Set Learn- Together with Grandparents' (Hewitt & Davis, in press), which both were run by Project READ Literacy Network Waterloo-Wellington (Project READ). The BRSS was designed for students in Grades 3 to 6 who were "at-risk" of school failure due to low socioeconomic status (SES), or due to having parents and/or guardians who had low literacy levels (Moore, Vandivere, & Redd, 2006) or who did not learn English as a first language (Rush & Vitale, 1994). The principals and/or teachers also helped to identify which students were having difficulties meeting the expectations for their grade level. The final samples included 11 participants whose families took part in both the 20-hour Project READ programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and the 10-hour BRSS component, 13 participants whose families took part in only the BRSS program along with the workshop and weekly literacy tips, and 20 participants who took part in the no- exposure control group. The intervention groups and the control group completed standardized measures of literacy

skills and a self-efficacy questionnaire at pretest and posttest and parents and/or guardians completed questionnaires. The control group was not asked to take part in any additional programs, but their families were offered a workshop after the posttesting was complete on ways to promote literacy skills at home. It was hypothesized that the intervention groups would have significantly greater increases in their scores than the no-exposure control group on all measures. When the intervention groups were treated as one overall group and compared to the control group, the intervention group had significantly greater improvements on reading comprehension skills than the control group. When the Project READ and BRSS program (PR/BRSS program), the BRSS program, and the control groups were compared as separate groups, the BRSS intervention group had significantly greater improvements in decoding skills than the PR/BRSS program group and the control group. Including SES as a covariate did not significantly change the results, but literacy measure scores were typically related to one another as expected. There were no significant changes in children's levels of self-efficacy from pretest to posttest, but results suggest that parents and/or guardians may have gained confidence in supporting their children's literacy skill development and communicating with their children's schools. Results are explained in terms of the BRSS group starting off with lower levels of decoding skills, and the importance of decoding skills as a prerequisite for strong reading comprehension skills (Gough & Tunmer, 1986; Hoover & Gough, 1990). Suggestions for future family-focused literacy interventions are provided.

Keywords: At-risk students, literacy, intervention, reading, comprehension, vocabulary, low SES, family literacy, self-efficacy, elementary grades

Acknowledgements

I am grateful to many people who played important roles in the process of completing this thesis. First of all, I would like to thank my advisor, Dr. Alexandra Gottardo, for her support and for sharing her knowledge and love of literacy research with me. This thesis also benefited greatly from the helpful feedback and encouragement from my two committee members, Dr. Eileen Wood and Dr. Dawn Buzza.

A special thank you goes to staff at Project READ Literacy Network –Waterloo Wellington for their involvement in this project. I am also thankful to Cambridge Self Help Food Bank for welcoming our team into their organization, and to all businesses and organizations who provided food donations. Funding for this project was provided by the Social Sciences and Humanities Research Council (SSHRC), Ontario Graduate Scholarship (OGS) and the J. P. Bickell Foundation. I would like to thank all of my program and testing volunteers from Wilfrid Laurier University who brought so much enthusiasm to the project. I would especially like to thank Amna Mirza and Phil Cave for their encouragement and assistance, and Dr. Tim Murphy of Brock University for the insightful discussions.

I would also like to thank the staff at the schools in the Waterloo Region who allowed us into their communities, including staff at Alpine Public School, Cedarbrae Public School, Winston Churchill Public School, and King Edward Public School.

Finally, I cannot express how thankful I am for the love and encouragement from my parents, Paul and Hilda Dol, and from my sister, brother-in-law and friends, who were always there to listen and to provide great perspective and support.

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The development of literacy skills is crucial for students' success in school. Beyond the school context, strong literacy skills help individuals function well in everyday life because these skills are important for gaining employment, taking part in life-long learning, understanding stories in the media, and knowing how to properly take medications (Kutner, Greenberg, Jin, Paulsen, & White, 2006). Furthermore, literacy levels of individuals within a country can affect the well-being of those individuals and the economic strength of a country as a whole (Canadian Council on Learning, 2010).

Despite the importance of literacy skills, it is clear that many individuals in North America have not developed strong reading and writing abilities (Canadian Council on Learning, 2010; Education Quality and Accountability Office, 2012a, 2012b; National Center for Education Statistics, 2011). Even among Canadian adults, almost 50% of these individuals do not have literacy skills that are developed enough "to cope in a modern society" (Canadian Council on Learning, 2010, para. 1). Given the proportion of adults with low literacy levels recorded in 2001, the Canadian Council on Learning (2008) claimed that by 2031, the number of adults with low literacy levels would be greater than 15 million.

Because of the necessity to have literacy skills to succeed in many facets of life, the Ontario Curriculum (Ministry of Education, 2006) has a major focus on various aspects of literacy development. Similarly, large-scale interventions such as Head Start in the U.S.A. offer programs for entire families who are of low socioeconomic status (SES) to provide them with a holistic approach to improving their well-being, including

support for helping children develop cognitive and literacy skills early in life (Office of Head Start, 2013). Despite these approaches to helping children develop stronger literacy skills, there is still a fairly high proportion of elementary children who are falling below the expected standards (Education Quality and Accountability Office (EQAO), 2012a, 2012b). Based on the EQAO (2012a) evaluations in the 2011 to 2012 school year for Ontario English-speaking schools, 34% of Grade 3 students are still falling below Ontario standards for reading, and 24% of Grade 3 students are falling below the Ontario standards for writing. Similar trends are seen in Ontario's EQAO (2012a) evaluations for Grade 6 students, with 25% and 26% of Grade 6 students failing to meet Ontario standards for reading and writing, respectively. Given these fairly high percentages of elementary children who are falling below provincial standards (Education Quality and Accountability Office, 2012a), and the number of adults who continue to struggle with literacy skills (Canadian Council for Learning, 2008, 2010), there is an obvious need for further investigation of literacy interventions that work with the entire family to help promote the development of literacy skills. The importance of the family and home environment for literacy skill development has already been widely recognized (Chall, 1983, 1996; Hart & Risley, 1995; Kelland & Wasielewski, 2011; Wasik, 2004).

Children and their families from low SES areas, however, are at particular risk of falling behind in their development of literacy skills (Chall, 1983, 1996; Hart & Risley, 1995; Kutner et al., 2006). Families of low SES tend to have fewer resources for practicing reading, such as books, than families of higher SES (Kutner et al., 2006) and they tend to provide less positive encouragement to their children than parents and/or guardians in higher income families (Hart & Risley, 1995). Therefore, children from

lower SES families may have less confidence as beginner readers (Hart & Risley, 1995). This is an important issue because self-efficacy, which is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391), is a key factor that allows the learning of new skills (Bandura & Locke, 2003; Dearing, McCartney, Weiss, Kreider, & Simpkins, 2004). Self-efficacy levels are predictive of how well children perform on academic-related tasks, and this should be a factor that is taken into account when implementing and evaluating interventions designed to help children overcome literacy struggles (Dearing et al., 2004).

Current Study

The main purpose of the current study was to design, implement, and evaluate an after-school literacy intervention program, called Better Reading for School Success (BRSS). The BRSS was implemented and evaluated in two instantiations 1) when it was offered along with a family literacy workshop and weekly literacy development tips that were provided to parents and/or guardians, and 2) when it was implemented and evaluated as one component of two similar programs, which were called 'Get Set Learn Afterschool' (Kelland & Wasielewski, 2011) and 'Get Set Learn-Together with Grandparents' (Hewitt & Davis, in press). These programs were offered by Project READ Literacy Network Waterloo-Wellington (Project READ). However, due to low participant numbers within the programs by Project READ, the BRSS was also offered on its own along with a parent/guardian workshop and weekly tips regarding how to promote literacy development at home. Both of these intervention groups were compared to a control group as one overall intervention group and they were also compared as two

separate intervention groups to the control group. The BRSS was designed for students in Grades 3 to 6 who were "at-risk" of school failure. These students were considered at-risk because they were from schools in areas of low socioeconomic status (SES) where many parents and/or guardians had low literacy levels (Moore et al., 2006), or the dominant language used in the home was not English (Rush & Vitale, 1994). The programs offered by Project READ were based on program manuals that were property of Project READ. These programs were designed for families and they were carried out for 10 weeks, once per week for 2 hours (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). The BRSS program was offered to children in Grades 3 to 6 for one hour of each Project READ session, or it was offered for one hour and five minutes when run on its own. The collaboration occurred in the Waterloo Region, where Project READ has experience offering family literacy programs to families in low-income areas. While the Project READ programs involved math as well as reading and writing literacy skills (Hewitt & Davis, in press; Kelland & Wasielewski, 2011), the BRSS program targeted reading and writing literacy skills with a particular focus on reading comprehension and vocabulary. The BRSS program was designed to include hands-on, enrichment- type activities and ongoing positive encouragement for the participants. The enrichment activities were typically science-based. For example, during one session, the facilitators explained how to find the main idea of a piece of writing and the children practiced finding the main idea in paragraphs about Benjamin Franklin and his discovery of electricity, which was done as a group. Next, the children practiced doing this on their own with a passage about Venus Flytraps. The hands-on science-based activities included feeding bugs to a Venus Flytrap and observing how the bugs were captured, and

building a circuit out of a battery, two wires, tape, and a light bulb, in order to make the light bulb light up. Facilitators and the children discussed how the circuit worked. When the BRSS program was offered without Project READ programs, the families were also provided with weekly tips and a workshop regarding how to promote literacy development at home. The study involved a pretest-posttest, no-exposure control group design. The no-exposure control group did not attend any of the interventions and only completed the pretesting and posttesting. The control group children and their families were invited to a workshop after the intervention and posttesting regarding ways that they can promote literacy skill development at home. There were therefore three conditions in the study: 1) the BRSS offered to children in Grades 3 to 6 along with a family literacy workshop near the beginning of the program and weekly literacy tips for parents and/or guardians (BRSS), 2) the BRSS offered to children in Grades 3 to 6 as a component of a larger family literacy program offered by Project READ (PR/BRSS), and 3) a no-exposure control group which involved only a family literacy workshop after the end of the intervention period. For some analyses, the BRSS group was combined with the PR/BRSS group as an overall intervention group. These conditions are summarized in **Figure 1**. The main purposes of the study were to evaluate:

a-i) how well children in Grades 3 to 6 whose families took part in the interventions improved on various literacy skills, including reading comprehension, vocabulary, reading fluency, reading accuracy, phonological processing, and verbal fluency, compared to the control group;

a-ii) whether controlling for SES led to different results when changes in scores on

literacy skill measures were compared across groups;

a-iii) the types of relationships among the various literacy skill measures;

b) whether children in Grades 3 to 6 whose families took part in the interventions had greater increases in reading and writing self-efficacy, and attitudes or motivation toward reading after the intervention than the control group; and

c) whether involvement in the interventions may have increased the levels of family involvement in the children's reading and homework efforts, and the levels of comfort in interacting with the children's schools.

Literature Review on Literacy

The next section of this introduction provides a discussion of the existing literature related to the influence of family and SES in literacy development, and the importance of self-efficacy and motivation in literacy development. Next, an explanation of how children transition through stages of literacy skill development will be provided, followed by a discussion of a key model of reading development, and of various important literacy skills. Finally, findings from previous literacy intervention studies regarding outcomes on measures of literacy skills and of self-efficacy and motivation for reading will be discussed.

Family Literacy

The importance of literacy development within the home has been widely discussed (Chall, 1983, 1996; Hart & Risley, 1995; Kelland & Wasielewski, 2011; Wasik, 2004). Project READ (n.d.) states that "'family literacy' [is]: Parents actively helping themselves and their children to become lifelong learners through a wide variety of daily activities" (para. 2). This idea of family literacy suggests that literacy lessons

within the school system must be supplemented by ongoing support for literacy development in homes. However, Albert Bandura (1997) argued that, particularly in low SES areas, there is often a lack of sense of community and that families do not necessarily interact with other families who attend the same schools, or with the staff at the school itself. Therefore, Bandura (1997) called for "rebuilding connectedness among school, home, and community" (p. 252) to improve the academic achievement and well-being of the children and youth living in these communities.

Family-Focused Literacy Interventions

Research on the impact of family involvement in children's literacy skill development has supported parent or guardian involvement as an important factor that influences how well children learn these skills (Chall, Jacobs, & Baldwin, 1990; Lee & Croninger, 1994; Leslie & Allen, 1999; Lonigan & Whitehurst, 1998; Saint-Laurent & Giasson, 2005). As will be seen in the following sections of this literature review, most of the literacy intervention evaluations that have been published in peer-reviewed journals have been focused mainly on interventions being offered to the children, but a few researchers have focused on family-based interventions (Chall et al., 1990; Leslie & Allen, 1999; Lonigan & Whitehurst, 1998; Saint-Laurent & Giasson, 2005).

One study that has focused on entire families involved 30 families of low SES who had children in Grades 2, 4, or 6 at the beginning of the study, and the children were followed into the third, fifth, and seventh grades, respectively (Chall et al., 1990). Records were kept regarding the extent to which the families of these children were involved in the school environment and helped with the children's homework. These factors were positively related to the extent to which the children's literacy skills had

developed and to the strength of their language skills as well (Chall et al., 1990). Other research has demonstrated that the frequency with which parents or guardians read with children at home is a major factor that is related to the development of children's own reading abilities (Leslie & Allen, 1999).

The importance of family literacy was also demonstrated by Lonigan and Whitehurst (1998) in a study involving children who were preschool-aged (three and four years old) and were from families of low SES. The children's oral language skills were below the expected standards at the beginning of the study. The purpose of the study was to evaluate the effectiveness of shared-reading as a method to help young children develop language skills (Lonigan & Whitehurst, 1998). The characteristics of the shared-reading program included an adult discussing a story as it was being read with a child and the adult being responsible for asking open-ended questions, extending on the child's responses, and asking "who, what, and when questions" (Lonigan & Whitehurst, 1998, p. 271). The shared-reading program also involved encouraging the child, repeating the child's responses back to them, and gearing discussions toward ideas that interested the child (Lonigan & Whitehurst, 1998).

Lonigan and Whitehurst (1998) assigned each child to one of four treatment groups which included: a) one control group that received no specific intervention but continued to attend their child care facility, b) one intervention group that involved child care facility teachers carrying out shared-reading with small groups of children, c) one intervention group in which parents were trained to do shared-reading with their children at home, and d) one intervention group in which children experienced shared-reading in small groups with their child care facility teachers and also at home with their parents.

The intervention period lasted six weeks (Lonigan & Whitehurst, 1998). Children completed standardized measures of oral language at pretest and posttest which revealed that "both child care teachers and parents can produce significant positive changes in the development of oral language of low-income children" (Lonigan & Whitehurst, 1998, p. 279). Overall, the largest effects for improvements in scores on the oral language measures occurred for the group that involved only the parents doing shared-reading at home and for the group that involved the combination of shared-reading with parents at home and with teachers at the child care facility. Anecdotal evidence also led Lonigan and Whitehurst (1998) to state that the intervention may have influenced how the parents read with their children even after the intervention period because "several parents reported that because of the study they discovered that both they and their children enjoyed shared-reading and many asked where they could obtain more books" (p. 284).

Saint-Laurent and Giasson (2005) described an intervention that involved evaluating students in Grade 1 and offering their parents nine workshops that lasted approximately one and a half hours each time. These families were from low- to mid-SES areas. Workshops were run by teachers and researchers, and focused on helping parents to promote literacy skill development with their children. Parents were told about how reading with their child(ren) could be effective, and how they could help their child improve their writing abilities, as well as how the parents and children could work on literacy skill development in interesting ways at home. The control group took part in the regular Grade 1 classroom, and pretests and posttests were completed to evaluate children's reading and writing abilities and related skills. In an Analysis of Covariance (ANCOVA) test, which involved children's overall pretest score based on tests of

"phonological awareness, concepts about print, and invented spelling" as the covariate (Saint-Laurent & Giasson, 2005, p. 264), results indicated that the children in the intervention had significantly higher vocabulary scores than the control group at posttest. Vocabulary scores were determined as ratings of vocabulary levels in stories written by the children. The children whose parents took part in the workshops also improved significantly on literacy skills such as their ability to spell, and how well they could write sentences. Finally, 82.2% of the parents in the workshops claimed that taking part in the workshops had produced major changes in how they approached helping their children with literacy skill development (Saint-Laurent & Giasson, 2005).

Socioeconomic Status (SES) and Literacy

Socioeconomic status (SES) has frequently been identified as a predictor of academic success (Caldas & Bankston, 1997; Magnuson, 2007; Malecki & Demaray, 2006; Sirin, 2005), and reading success in particular (Bowey, 1995; Warren-Leubecker & Carter, 1988). Although results in the literature tend to confirm the importance of SES, SES as a construct varies across studies. SES typically refers to income; however, maternal education (Caldas & Bankston, 1997; Magnuson, 2007) and occupation (Caldas & Bankston, 1997), paternal education (Caldas & Bankston 1997) and occupation (Bowey, 1995; Caldas & Bankston, 1997), and the use of subsidized lunch programs (Caldas & Bankston, 1997; Malecki & Demaray, 2006; Warren-Leubecker & Carter, 1988) have all served as proxies or indicators of SES for individuals and families. It has been widely agreed that literacy development opportunities can be vastly different within homes of low income earners versus homes of higher income earners (Chall, 1983, 1996; Hart & Risley, 1995). In Hart and Risley's (1995) longitudinal study regarding how

families of various SES levels interacted with their children in ways that may provide opportunities for language development, the authors noted that for children three years of age and under, there was a positive relationship between SES and the number of words parents said to their children. Therefore, children in lower SES families were spoken to less often than those in higher SES families, which consequently provided fewer opportunities for the children in lower SES families to develop their vocabulary (Hart & Risley, 1995). However, Hart and Risley (1995) noted that all parents provided care, interaction, and affection to their children. Despite this good care, "[s]imply in words heard, the average welfare child was having half as much experience per hour (616 words per hour) as the average working-class child (1, 251 words per hour), and less than one third that of the average child in a professional family (2, 153 words per hour)" (Hart & Risley, 1995, p. 197).

Clearly this difference in the number of vocabulary words heard at home is related to differences in children's literacy and language development at an early age (Hart & Risley, 1995). Hart and Risley (1995) reported that even at age three, SES was correlated positively with vocabulary development. In particular, in Hart and Risley's (1995) study, the improvements in the children's vocabulary over time had a correlation of .65 with family SES, and the number of vocabulary words used by the children had a correlation of .63 with the families' SES. In addition, Hart and Risley (1995) noted that the SES of a child's family in America was found to influence 30% of the variability in scores on the Peabody Picture Vocabulary Test-Revised.

The parents and guardians of lower SES also tended to have lower literacy levels themselves, making it more difficult for them to help their children develop strong

literacy skills (Kutner et al., 2006). Kutner et al. (2006) reported that in lower SES families (measured with such indicators as education level and whether the family was above or below poverty level), adults tended to have lower abilities to read for everyday tasks that may have had an impact on their well-being. Examples of these tasks included reading information about health risks of medications and reading about how to obtain health insurance (Kutner et al., 2006). In lower SES families, parents and/or guardians may have difficulty in helping their children with homework and reading (Kutner et al., 2006). In a recent report, 25% of parents and/or guardians with below basic literacy levels stated that they never helped their children with homework, whereas only 8% of parents and/or guardians with a proficient literacy level stated that they never provided help to their children on their homework (Kutner et al., 2006). Even resources within the home for developing literacy skills, such as books or magazines, may be less available for children in families with lower incomes (Kutner et al., 2006). For instance, Kutner et al. (2006) stated that in self-reports by adults with children who were younger than 18 years old, 54% of the adults whose literacy skills were below the basic level stated that they had many items to read in the home. In contrast, 96% of adults with proficient literacy levels stated that they had many resources (Kutner et al., 2006). Another issue that may differ across families of various levels of SES is how much reading self-efficacy the children have (Hart & Risley, 1995).

Despite these difficulties, there is evidence that literacy interventions may be able to help improve the reading skills of children in low SES families who are struggling with reading (Biggart, Kerr, O'Hare, and Connolly, 2013). For example, Biggart et al. (2013) evaluated a literacy intervention that was offered in the after-school hours to five-

and six-year-old children in a low SES area of Ireland. In this study, 464 children who were randomly assigned to either the intervention group or the control group completed pretest and posttest measures. The intervention being evaluated was called "*Doodle Den*" (O'Rourke, Kennedy, & Axford, 2008, as cited in Biggart et al., 2013, p. 131). Children attended the 36-week intervention three times a week for an hour and a half each time. The daily programs followed a similar schedule as the BRSS programs evaluated in the current study, which included attendance-taking and providing food to the attendees, literacy lessons and work, and a recreational activity that involved physical activity, acting or singing, or creative arts (Biggart et al., 2013), although the intervention by Biggart et al. (2013) was much more long-term. In contrast, the BRSS intervention included a fun science-based activity at the end and involved fewer intervention days. Biggart et al. (2013) explained that their intervention focused on "writing, text comprehension, phonics, sight vocabulary, independent reading and fluency" (p. 131). Teachers were also asked to rate the participants' levels of literacy. Following the intervention period, the intervention group scored significantly higher on a reading test, which included measures of "word recognition (15 items); picture recognition (5 items); sentence structure (5 items) and word choice (5 items)" (Biggart et al., 2013, p. 134), and there was a small effect (d = .17; Cohen, 1988). Teacher ratings of the participants' literacy levels were also significantly higher for children in the intervention than in the control group, and there was a small effect (d = .28; Cohen, 1988).

Self-Efficacy

In regards to self-efficacy, Bandura (1997) argued that "perceived self-efficacy is concerned not with the number of skills you have, but with what you believe you can do

with what you have under a variety of circumstances" (p. 37). The levels of self-efficacy that children have in relation to reading and writing are clearly important in their development of reading skills as Bandura and Locke (2003) stated that "a resilient sense of efficacy provides the necessary staying power in the arduous pursuit of innovation and excellence. During difficult endeavors, people have to … be willing to take risks under uncertainty" (p. 97). Higher self-efficacy has been demonstrated to be positively related to better performance on literacy tasks (Dearing et al., 2004).

Self-efficacy may be lower in children from families of low SES than in those from families of higher SES due to differences in parenting approaches (Hart & Risley, 1995). For example, Hart and Risley (1995) reported results from their longitudinal study involving infants who were observed within their families until they were approximately 3 years old. Hart and Risley (1995) reported, "professional parents gave their children affirmative feedback every other minute, more than 30 times per hour, twice as often as the working-class parents gave their children affirmative feedback" (p. 126). Hart and Risley (1995) also observed that "[t]he children in welfare families heard a prohibition twice as often as they heard affirmative feedback" (p. 126), which could have an impact on the children's self-efficacy for various tasks. Based on a study with an older sample of children in Kindergarten to Grade 5, Dearing et al. (2004) reported that once a child's confidence level was included in predicting their performance on literacy skill measures, the effect of how often their family helped them with their schooling was no longer significant. Therefore, Dearing et al., (2004) demonstrated how crucial self-efficacy is for children to be able to develop strong literacy skills over time.

Attitudes Toward Reading/ Motivation for Reading

The importance of attitudes toward reading, or motivation for reading, has been recognized by various authors (Guthrie, Hoa, Wigfield, Tonks, Humenick, & Littles, 2007; Wigfield & Guthrie, 1997). For example, parents in Wigfield and Guthrie's (1997) study, which included 59 students in Grade 4 and 46 students in Grade 5, were asked to log the amount of time their child spent reading for pleasure in the home. Children were recognized at the school on a wall showing students who had read from 30 to 100 hours outside of school, and children were given prizes at assemblies. Records of how often students read outside of the school and how many different books students read outside of the school during the school year were also collected from a staff member. In addition, the children filled out questionnaires as self-reports of their motivations for reading in the Fall and again in the Spring. Wigfield and Guthrie (1997) grouped the students by their level of intrinsic motivation, which indicated how likely they were to read for enjoyment, and by their level of extrinsic motivation, which indicated how likely they were to read for grades, prizes, or other external motivational factors. Wigfield and Guthrie (1997) reported that the students with the highest intrinsic motivation levels logged more time reading and more variety in their reading than those who had the lowest levels of intrinsic motivation. In contrast, Wigfield and Guthrie (1997) reported that the levels of extrinsic motivation were less strongly related to how much time the students spent reading outside of school and how many different books the students read.

In their study on motivation and reading comprehension development, Guthrie et al. (2007) reported that many indicators of attitudes toward reading or motivation for reading were related to improvements in reading comprehension over time. In Guthrie et al.'s (2007) study, 31 Grade 4 students took part in questionnaires, interviews, and

measures of reading comprehension including the Gates-MacGinitie Reading Comprehension Test. Guthrie et al. (2007) used regression analyses to determine which motivational factors would significantly predict the increase in scores on the reading comprehension measures from September to December, and they controlled for the scores in September in order to consider the increase in scores over time. When these analyses were carried out, Guthrie et al. (2007) reported that how interested the children were in reading, or how positively they felt about reading and reading material, accounted for 12% of the variability in the increases in the reading comprehension scores. In addition, Guthrie et al. (2007) reported that in regards to accounting for variability in increases in reading comprehension scores, the level to which the children believed that they should get to choose what they read (rather than having to read assigned material or having someone else select books for them) accounted for 22% of the variability, whereas the children's level of involvement in reading, or the level to which they could be described as "being absorbed in reading" (p. 296) explained 12% of the variability. Clearly children's attitudes toward reading or motivation for reading can play a part in their reading skill development (Guthrie et al., 2007; Wigfield & Guthrie, 1997).

Stages of Literacy Skill Development in the Elementary Grades

The development of the ability to read can be viewed as occurring in successive, although somewhat overlapping stages (Chall, 1983; 1996). Chall (1983, 1996) has outlined useful stages of literacy skill development, and of particular importance to the proposed study is Chall's (1983, 1996) discussion regarding an important transition from the early elementary grades to the later elementary grades in terms of literacy skill development. Chall (1983, 1996) noted that "in the primary grades, children learn to

read; in the higher grades, they read to learn" (p. 20). In Chall's (1983, 1996) first stage of literacy development, children are developing decoding skills (Chall, 1983, 1996). However, Chall's (1983, 1996) second stage of literacy development explains that in approximately Grades 2 and 3, children are mostly focused on reviewing what they have already learned and practicing their reading skills, rather than reading to learn about new topics. In this second stage, children are practicing decoding words, which can be supported by allowing children to access books they have already heard or read because the topic will already be known to them. Prior to Grade 4, children are not as focused on learning new things from reading, but rather on building the necessary literacy skills to learn how to read in general (Chall, 1983, 1996).

The important transition occurs between this second stage, and Chall's (1983, 1996) third stage of literacy development, which involves children in approximately Grades 3 and 4. In this third stage, children are expected to be able to read basic material independently and they begin to take classes on specific subjects such as Science or Math, in which they must use their literacy skills to learn. Therefore, within this third stage, children must be able to read in order to comprehend lessons about new topics, rather than spending time focusing on developing specific literacy skills. In particular, they require "sufficient knowledge of the meanings of more academic and abstract words, sufficient reasoning ability to understand the more difficult texts, and facility with reading skills- word recognition and decoding, and fluency" (Chall, 1996, Introduction-xii).

Furthermore, Chall (1983, 1996) argued that from the very beginning of literacy acquisition at the pre-reading stage, there may be a gap in literacy skills between children

from families of different SES, with the children in families of lower SES falling behind in these skills early on. In addition, Chall (1983, 1996) stated that this difficulty experienced by children in families of lower SES becomes even more profound compared to children from higher SES families by Grades 2 to 3, and without intervention, by Grade 4, the gap can be even wider. This drop in literacy development by Grade 4 tends to occur with many children across different levels of SES, in what Chall (1983, 1996) referred to as "The 4th Grade 'Slump'" (p. 67). However, Chall (1983, 1996) pointed out that these important literacy skills may not be as developed in children from lower SES families because for lower SES families there may be fewer funds to purchase reading materials and the parents and/or guardians may not be likely to focus on literacy activities in the home. Chall (1983, 1996) therefore argued that children of low SES tend to have fewer experiences and opportunities to reach the first stages of learning how to read and that "the child loses out on the emotionally confirming responses that books and reading matter bring" (p. 20). Therefore, the transition to each stage of literacy skill development may be delayed for children from families of lower SES (Chall, 1983, 1996). The participants of the proposed study will be children in Grades 3 to 6 who are from low income areas, so they are at risk of being behind in basic literacy skills (Chall, 1983, 1996). At this crucial transition point between the lower and upper elementary grades, the development of reading comprehension skills is particularly important (Chall, 1983, 1996).

Simple View of Reading

A popular model of reading comprehension has been called the 'Simple View of Reading' (Gough & Tunmer, 1986; Hoover & Gough, 1990). In particular, the Simple

View of Reading argues that there are two skills required for reading comprehension (R) in a specified language: decoding skills (D) and linguistic comprehension (L) skills (Gough & Tunmer, 1986; Hoover & Gough, 1990). Hoover and Gough (1990) defined linguistic comprehension as "the ability to take lexical information (i.e. semantic information at the word level) and derive sentence and discourse interpretations" (p. 131). In addition, Hoover and Gough (1990) defined "skilled decoding [as] simple efficient word recognition: the ability to rapidly derive a representation from printed input that allows access to the appropriate entry in the mental lexicon, and thus, the retrieval of semantic information at the word level" (p. 130). In this model, whether someone can comprehend text in a certain language can be thought of as a range of abilities on each of those three concepts which would be a score of zero if they had no ability and a score of 1 if they had perfected that skill (Gough & Tunmer, 1986; Hoover & Gough, 1990). Thus, Hoover and Gough (1990) argued that using this conceptualization, reading comprehension is a product of both decoding skills and linguistic comprehension: "R = D x L" (Hoover & Gough, 1990, p. 132). Thus, the Simple View of Reading as discussed by Gough and Tunmer (1986) and Hoover and Gough (1990) has been useful in explaining variance in reading abilities.

Skills Required for Reading

In this section, important components of literacy development will be discussed. This section will include a discussion of the literature regarding reading comprehension, vocabulary, reading fluency, reading accuracy, phonological processing and awareness, and verbal fluency.

Reading comprehension and vocabulary. Having a highly developed

vocabulary is important for being able to understand what is being read, and there is a clear relationship between reading comprehension and the vocabulary level of a developing reader (Mezynski, 1983; Qian, 2002). This relationship between reading comprehension and vocabulary has been demonstrated by Qian (2002) who carried out a study involving 217 students who were learning English as a second language in Toronto. How well the students performed on a test of their academic reading was predicted about equally well by both how deeply the children understood each of the vocabulary words they were tested on, as well as the number of different words they knew (Qian, 2002). When considered on their own, each portion of the testing that focused on vocabulary accounted for between 54 and 59% of the variability in the reading comprehension scores. One of these vocabulary measures tested how deeply the students understood each vocabulary word and how many words they knew, and the other measures tested how well the students understood synonyms (Qian, 2002). Similar results regarding the relationship between vocabulary scores and reading comprehension scores have been reported in a study involving children that had English as their first language as well (Ouellette, 2006). The literacy intervention designed for the proposed study will focus mainly on teaching the participants strategies that can be used to improve their reading comprehension and vocabulary knowledge.

Reading fluency. Reading fluency is also an important skill that is required in order to be a strong reader (Tilstra, McMaster, Van den Broek, Kendeou, & Rapp, 2009). In a study involving students in Grades 4, 7, and 9, Tilstra et al. (2009) noted that although the 'Simple View of Reading' (Gough & Tunmer, 1986; Hoover & Gough, 1990) was able to account for much of the variability in the students' reading

comprehension skills, the students' reading fluency also accounted for additional variability in their reading comprehension abilities (Tilstra et al., 2009). Reading fluency can be described as "the ability to group words into meaningful grammatical units and to read quickly, effortlessly, and with expression (LaBerge & Samuels, 1974; National Reading panel [NPR], 2000, as cited in Tilstra et al., 2009, p. 385). In addition, "reading fluency [is] commonly measured as the number of words read correctly in 1 minute" (Riedel, 2007, as cited in Tilstra et al., 2009, p. 385). Reading fluency accounted for 8% of the variability in how well the students in Grade 4 comprehended what they read after already taking into account variance explained by the decoding and linguistic comprehension abilities (Tilstra et al., 2009) of the 'Simple View of Reading.' Furthermore, research has indicated that an individual's reading fluency skills influence their reading comprehension, but there is also evidence that reading comprehension may influence reading fluency, in that both skills influence the development of one another (Klauda & Guthrie, 2008). In addition, prior knowledge of the topic a child is reading about is an important factor that can affect both their reading comprehension (Compton, Miller, Elleman, & Steacy, 2014; Torgesen & Hudson, 2006) and their reading fluency (Torgesen & Hudson, 2006).

Reading accuracy. Reading accuracy is another important component of literacy skill development (Cain, Oakhill, & Bryant, 2004). Cain et al. (2004) began a longitudinal study with 102 children who were seven or eight years of age in order to understand children's reading comprehension and the related skills that are necessary. These children were tested at approximately eight, nine, and eleven years of age. All tasks were completed by 100 children at the first stage, 92 at the second stage, and 80

children at the third stage. Each time, the children's reading accuracy scores were at or above where they should have been, whereas comprehension skills began at an appropriate level for their age, but then dropped below the expected level over time. Cain et al. (2004) pointed out that although "word reading ability is a significant determinant of reading comprehension" (p. 37), it is not sufficient to lead to an increase in comprehension scores.

Phonological processing and phonological awareness. Phonological processing is another major component of literacy skills, and has been defined as "the use of phonological information (i.e., the sounds of one's language) in processing written and oral language" (Wagner & Torgesen, 1987, p. 192). One important sub-skill of phonological processing is phonological awareness, which has been defined as "awareness of the sound structure of language" (Wagner & Torgesen, 1987, p. 192). The two other aspects of phonological processing include "*phonological recoding in lexical access*, that is, getting from a written word to its lexical referent by recoding the written symbols into a sound-based representational system" (Baron & Strawson, 1976, Coltheart, Davelaar, Jonasson, & Besner, 1977, Crowder, 1982, Kleiman, 1975, Liberman & Mann, 1981, Martin, 1978, Meyer, Schvaneveldt, & Ruddy, 1974, as cited in Wagner & Torgesen, 1987, p. 192), and "*phonetic recoding to maintain information in working memory*, that is, recoding written symbols into a sound-based representational system that enables them to be maintained efficiently in working memory during ongoing processing" (Baddeley, 1982; Conrad, 1964; Mattingly, 1980, as cited in Wagner & Torgesen, 1987, pp. 192-193). Rosner and Simon (1971) have demonstrated the relationship between phonological awareness and reading ability. In their study, the

correlations between a test of phonological awareness and the language subtest of the Stanford Achievement Test for children in Grades 2, 3, 4, and 5 were all at least .5 and were all significant, after the children's IQs were partialed out (Rosner & Simon, 1971).

Verbal fluency. Another factor in reading ability is verbal fluency (Cohen, Morgan, Vaughn, Riccio, & Hall, 1999). Cohen et al. (1999) measured verbal fluency by asking the participants of their study to name as many items as they could that began with specified letters in half a minute. Cohen et al. (1999) reported that children from age six to twelve did significantly better with increases in age, with children who were six years old naming approximately 15.53 words, and children who were twelve years old naming approximately 30.42 words (Cohen et al., 1999). Verbal fluency is also related to working memory in that "individuals who have a greater capacity to coordinate the processing and temporary storage requirements of speaking are more verbally fluent and less prone to making articulatory errors while speaking or reading aloud" (Daneman, 1991, p. 461).

Literacy Interventions

Given that there are so many components of reading ability, it is important to consider how literacy interventions may affect each of these components. The following section discusses literature regarding literacy interventions and the effects, or lack thereof, on various literacy skills that will be evaluated at pretest and posttest for the proposed literacy intervention project. These skills include reading comprehension, vocabulary, reading fluency, reading accuracy, phonological processing, and verbal fluency. In addition, a section regarding literacy interventions and their effects on self-efficacy and attitudes toward reading is included.

Reading comprehension. According to Moskal and Keneman (2011), reading comprehension is just one variable that should be evaluated at pretest and posttest time periods in order to evaluate the effectiveness of literacy interventions. Kim, Samson, Fitzgerald, and Hartry (2010) found the intervention they evaluated with children in the late elementary grades, READ 180®, did not help to improve the participants' comprehension scores more than children who attended a typical after-school program that was offered by the school district. However, literacy interventions have generally been found to be promising in terms of improving reading comprehension skills in young children and youth (Edmonds, Vaughn, Wexler, Reutebuch, Cable, Tackett & Schnakenberg, 2009; Kim, Capotosto, Hartry, & Fitzgerald, 2011; Schacter, 2003; Schacter & Jo, 2005; Luftig, 2003; Vaughn, Klingner, Swanson, Boardman, Roberts, Mohammed, and Stillman-Spisak, 2011; Van Andel, 2011). For example, Edmonds et al. (2009) synthesized studies carried out with students who were performing below standards for reading abilities, including any studies carried out from 1994 to 2004 conducted with students in the sixth to twelfth grades. Within the studies included by Edmonds et al. (2009), the interventions had involved meeting with the students two to seventy times for the intervention sessions, although not all studies reported the number of times they met with the students. Thirteen intervention studies were included in a meta-analytic analysis and using weighted means, Edmonds et al. (2009) found that participants in the literacy interventions included in the analysis had significant improvements over the control groups in regards to reading comprehension, and that there was an effect size of $d = .89$, which is a large effect (Cohen, 1988).

In addition, Kim et al. (2011) evaluated the literacy intervention called READ

180® by Scholastic, Inc.™ with students in the fourth to sixth grades from low-income areas, the majority "of whom scored below proficiency on the Massachusetts Comprehensive Assessment System (MCAS) in English language arts" (Kim et al., 2011, p. 184). This study by Kim et al. (2011) was similar to the study by Kim et al. (2010) described previously. However, the study by Kim et al. (2010) included participants who had lower reading levels than those included in the study by Kim et al. (2011). In addition, Kim et al.'s (2011) study included lessons with children separated into smaller groups and also lessons as one large group whereas Kim et al.'s (2010) study included only the smaller groups suggested in the upgraded version of the intervention program. Finally, Kim et al.'s (2011) study involved the teachers following very specific lessons and activities laid out in a book compared to Kim et al.'s (2010) study which involved teachers designing their own lessons and activities to teach the concepts. The READ 180® program was evaluated by Kim et al. (2011) using measures of various literacy skills, including reading comprehension, with a control group. The program ran for eight hours per week, with time evenly distributed over four days and this continued for 23 weeks of the school year. Participants in the intervention took part in the READ 180® program whereas the control group took part in another after-school program offered by the school district. This after-school program offered by the school district involved the teachers providing lessons to subgroups of 5 or fewer students based on their reading abilities. These lessons focused on topics such as history and math, as well as lessons focused on literacy skills such as reading comprehension. There were 312 students in the study who were randomly assigned to either the READ 180® program or the other after-school program offered by the district. Kim et al. (2011) explained that within the READ

180® program, participants received a variety of supports including computer activities, reading activities led by teachers, and time for reading on their own as well as having teachers read to them to model how it can be done. Kim et al. (2011) reported that measures of "vocabulary, reading comprehension, spelling, and oral reading fluency" were completed both before and after the intervention (p. 184). Using a shortened version of the SAT 10, it was found that after the participants in the intervention had completed the READ 180® program, they performed significantly better on reading comprehension than the control group (d = .32; Kim et al., 2011) although the effect was small (Cohen, 1988).

Similar results have been found for students in middle school in the United States in regards to reading interventions and their effects on comprehension (Vaughn et al, 2011). Vaughn et al. (2011) conducted a large-scale intervention with 34 Grade 7 and 8 classes participating in an intervention, which were compared to 27 Grade 7 and 8 classes that served as controls. The intervention was taught with a focus on metacognitive skills and "collaborative strategic reading" (Vaughn et al., 2011), which involved "teach[ing] students how to monitor their comprehension and also how to use procedures for clarifying understanding when difficulties arise" (p. 940). In addition, Vaughn et al. (2011) explained that "[s]tudents also learn main idea and questioning practices that assist them in reading. Cooperative learning practices while implementing comprehension strategies in the context of reading are also a critical component of CSR" (p. 940). Based on the scores of standardized tests, Vaughn et al. (2011) reported that the intervention group performed significantly better than the control group on a test that measured their reading comprehension.

Furthermore, a recent Canadian Master's thesis involving students who were in Grade 2 to Grade 5 prior to the summer holidays evaluated a library literacy program hosted in the summer. Children who accessed the library literacy programs did not improve on any measures of literacy skills in comparison to a control group, except for one measure of reading comprehension (Van Andel, 2011). However, Van Andel (2011) noted that this difference between groups was likely caused by certain participants in the library intervention, particularly those who read the most throughout the summer, because these participants showed the greatest improvements. For this study, 16 children participated in a literacy program whereas 53 children completed testing batteries as part of the control group. Van Andel (2011) explained that there was likely a selection bias due to the fact that the children were not randomly assigned to the intervention or control group, but rather they or their families decided to sign them up for the program at the library. The program focused on encouraging children to read over the summer by keeping track of how many books they read and having the children attend the library to select prizes based on their reading completion (Van Andel, 2011).

Vocabulary. Although not all literacy interventions have been found to lead to improvements in vocabulary (Kim et al., 2010), some literacy interventions have had a positive impact on vocabulary development (Lesaux, Kieffer, Faller, & Kelley, 2010; Kim et al., 2011; Saint-Laurent & Giasson, 2005; Schacter, 2003). For example, Lesaux et al. (2010) used a quasi-experiment to evaluate a literacy intervention called "Academic Language Instruction for All Students (ALIAS)," (p. 202) which was for participants who had learned English as a second language or who were struggling with language abilities. Lesaux et al. (2010) included 13 Grade 6 classrooms in the intervention and 8 Grade 6

classrooms in a control group. This large intervention included 18 weeks of in-class instruction over 4 days each week for 45 minutes, and focused on interesting reading passages from a magazine and strategies to improve reading comprehension and vocabulary (Lesaux et al., 2010). For example, the participants were taught how to use strategies such as using surrounding text to determine what unknown words meant, and the importance of discussing answers to questions about what they have read. In total, 476 students participated with 296 who were given the intervention and 180 who were in the control group. Although the intervention and control groups demonstrated no significant differences on a *standardized* test of vocabulary skills, the intervention students performed significantly better than the control group on multiple tests of vocabulary such as tests of how well students knew what the words they learned about in the intervention meant (d = .39), and how well the students were able to read passages and understand what words meant (d = .20; Lesaux et al., 2010). These were medium and small effect sizes, respectively (Cohen, 1988). There was also a trend toward significance (p = .083, d = .15) for the intervention group doing better than the control group on a test of how deeply they understood vocabulary words, measured with a task called Target Word Association, which required them to understand how words were related (Lesaux et al., 2010). The effect size was small (Cohen, 1988). There was a trend toward significance for the intervention group having better comprehension scores than the control group as well (p = .057, d = .15; Lesaux et al., 2010), and this effect size was also small (Cohen, 1988).

Similarly, a summer reading intervention for Grade 1 students of low SES families, which involved children attending five sessions each week over an eight week

period, was reported to be successful in terms of promoting vocabulary development (Schacter, 2003). During this intervention, various recreational activities as well as two hours of literacy lessons were offered each day (Schacter, 2003). With 30 students who participated in the control group and 21 who participated in the intervention, the intervention group improved significantly more than the control group, with an effect size of $d = 1.00$ (Schacter, 2003), which was a large effect (Cohen, 1988).

Reading fluency. Some literature has indicated that it may be difficult to help children improve reading fluency through literacy interventions (Kim, 2006, Kim et al., 2011; Vaughn et al., 2011). For example, Kim (2006) evaluated a literacy intervention that was held in the summer months for students in the late elementary grades who were struggling with literacy skills, and who were from areas that had many families in poverty and racial minority students. One aspect of the program involved providing more reading materials by giving eight books at no cost to the intervention participants. Steps were taken to ensure the books were suitable for the students' reading levels. Teachers also used some time at the end of the school year to teach the children strategies on how to improve their comprehension strategies such as asking questions about what they just read or summarizing what they read before continuing. The teachers also talked to them about the importance of reading to someone else a section of what they were reading, which has been called "paired reading" (Topping, 1987, as cited in Kim, 2006, p. 343). Although both intervention and control group participants received these lessons, only intervention participants were sent books and reminders about skills to work on at home as a method of promoting home reading during the summer. With 252 students who completed the intervention and 234 who remained in the control group until the end of

the study, groups were compared, but no significant differences in reading fluency were found (Kim, 2006).

Another example of an intervention that showed no improvements in children's reading fluency was the intervention by Vaughn et al. (2011), which involved "collaborative strategic reading" and helping students in Grade 7 and 8 develop metacognitive strategies (p. 940). This study was described above in the section on literacy interventions and reading comprehension. At the end of the intervention period, Vaughn et al. (2011) reported that there were no significant differences in how well the intervention and control groups performed on a reading fluency measure, although the authors note that there were no specific lessons on how to read more quickly, but rather they were more focused on how to comprehend the text better.

Some authors have reported mixed results in terms of how a literacy intervention may influence reading fluency scores (Cave, 2012; Kim et al., 2010). For example, Kim et al. (2010) reported that in their evaluation of the READ 180® program (previously discussed under the section about literacy intervention and reading comprehension), there were mixed results based on two measures that targeted reading fluency. Kim et al. (2010) reported that there were no significant effects on scores on the TOWRE (Test of Word Reading Efficiency) compared to the control group but that intervention participants did improve significantly more than the control group on oral reading fluency as measured by DIBELS Oral Reading Fluency (DORF). However, this significant improvement was mainly caused by students in Grade 4 because only students in Grade 4 significantly improved when the grades were considered separately (Kim et al., 2010). Kim et al (2010) explain that the students in Grade 4 may have improved more than the

children who were older because "it may be more difficult to remediate the reading difficulties of older children than younger children" (p. 1127).

Further mixed results were reported regarding the effects of an after-school literacy intervention on reading fluency (Cave, 2012). Cave (2012) reported results of an after-school program that was carried out with children in Grades 3 to 6 for approximately one and a half hour sessions, once per week over six weeks. In this study, participants were from low-income areas. The participants completed standardized measures, then completed them again approximately six weeks later in order to serve as a waitlist control group, and then finally completed the same measures again after the six week intervention. The Test of Word Reading Efficiency (TOWRE) was used to measure reading fluency, and results indicated that the scores on the Phonemic Decoding subtest improved significantly following the intervention, but scores on the Sight Word Efficiency subtest did not(Cave, 2012). Therefore, although findings are mixed within the literature as a whole, there are some promising results in terms of literacy interventions and their effects on reading fluency (Cave, 2012; Kim et al., 2010).

Reading accuracy. Word reading accuracy is a key variable targeted in interventions to help young readers improve this skill (Coyne, Kame'enui, Simmons, & Harn, 2004; Schacter, 2003). For example, Coyne et al. (2004) carried out a literacy intervention program for children who were at risk of having difficulties with reading to evaluate whether an "inoculation" hypothesis or "insulin" hypothesis would better explain the results of literacy intervention effects (p. 91). Participants were selected based on their scores on "the Onset Recognition Fluency (OnRF) and the Letter Naming Fluency (LNF) subtests of the *Dynamic Indicators of Basic Early Literacy Skills*

(DIBELS; Kaminski & Good, 1996, as cited in Coyne et al, 2004, p. 94) in Kindergarten. Students were chosen to be participants if their scores were in "the lowest quartile of the children that took part in the screening" (Coyne et al., 2004, p. 94). The "inoculation" hypothesis claims that if children participate in interventions early on to overcome difficulties with phonological skills and difficulties with using the alphabet, then many children can continue developing at a typical rate following this intervention without any extra support for their literacy skills later on (Coyne et al., 2004, p. 91). In contrast, the "insulin" hypothesis states that early intervention is key, but that children in these interventions must receive ongoing intervention support in order to keep up with their peers who do not have early difficulties with literacy skills (Coyne et al., 2004, p. 91).

After 112 children from seven schools took part in Kindergarten interventions with a focus on phonological awareness and understanding of letters and sounds, those who improved the most following the interventions and were still available for participation in research then took part in the study by Coyne et al. (2004), which resulted in 59 participants by the end. In Grade 1, these students were randomly assigned to either the typical classroom instruction or an intervention involving an extra half hour of assistance for 50 days. The participants completed various measures of literacy skills, including those of reading accuracy. Coyne et al. (2004) reported that there were no significant differences on measures of reading accuracy between those students who were in the ongoing intervention in Grade 1 compared to those who had only attended the initial intervention in Kindergarten. These results supported the "inoculation" hypothesis (Coyne et al., 2004, p. 91). However, of the participants who took part in the Kindergarten intervention, 53% obtained scores higher than the seventy-fifth percentile

on the Word Identification subtest of the Woodcock Reading Mastery Test-Revised, whereas 71% of the students obtained scores higher than the seventy-fifth percentile on the Word Attack subtest at the end of the study, even after having been identified as at-risk of having difficulties with reading in Kindergarten, which indicated that the Kindergarten intervention may have had long-term effects for promoting reading accuracy (Coyne et al., 2004).

Phonological processing speed. Although few authors have measured the effects of interventions on phonological processing in young children, those who have done so have reported promising results (Nelson, Benner, & Gonzalez, 2005). Nelson et al. (2005) reported a study regarding a group of children who were showing signs of falling behind in literacy skills or having emotional disorders and who took part in a literacy intervention program. There were 18 Kindergarteners in the intervention and 18 in the control group. The children in the intervention took part in "*Stepping Stones to Literacy*" (Nelson, Cooper, & Gonzalez, 2004, as cited Nelson et al. 2005, p. 4), which involved 25 scripted lessons for children that focus on: "1. identification, manipulation, and memory of environmental sounds (parallel phonemic awareness tasks); 2. letter names; 3. sentence meanings; 4. phonological awareness; 5. phonemic awareness; and 6. Serial processing or rapid naming" (Nelson et al., 2005, p. 6). Phonological processing speed was measured with age-appropriate subtests of the Comprehensive Test of Phonological Processing, including the Rapid Color Naming and Rapid Object Naming tasks. Children in the intervention group had significantly greater improvements from pretest to posttest than the children who were in the control group, with an effect size of 1.31 (Nelson et al., 2005), which is a very large effect (Cohen, 1998).

Verbal fluency. A literature search was conducted for studies regarding literacy interventions with a focus on verbal fluency. The PsycARTICLES database was used with the search terms "'*verbal fluency*' 'OR' '*oral fluency*,' 'OR' '*naming fluency*' 'AND' '*intervention*,'" and the search was narrowed down by requesting only peer-reviewed articles and only those focused on preschool to adolescent age groups. This search yielded 77 articles, and abstracts were visually inspected. At the time of writing, none of these studies were found to be focused on literacy interventions and their effects on verbal fluency.

Self-efficacy and attitudes toward reading/motivation for reading. Very few authors have discussed the effects of literacy interventions on self-efficacy for reading (Wigfield, Guthrie, Tonks, & Perencevich, 2004), and on attitudes toward reading, or motivation to read (Kim et al., 2010; Wigfield et al., 2004). In a study by Wigfield et al. (2004), two different literacy interventions were compared in regards to their effects on Grade 3 students' reading self-efficacy and motivation. In both interventions, children were taught strategies that they could use to improve their reading. The strategies they were taught included "activating background knowledge, student questioning, searching for information, summarizing, organizing graphically, and learning story structure for literacy materials" (Wigfield et al., 2004, p. 302). First these strategies were introduced to the children one at a time and then they were used together depending on which strategy was most appropriate for the activity being done. Both interventions lasted for 12 weeks and were carried out every weekday. The first intervention "Concept-Oriented Reading Instruction," (Wigfield et al., 2004, p. 304) lasted for an hour and a half to two hours each day, and involved motivating students to read by having the children

participate in science activities related to reading passages. Children in this intervention were also encouraged to decide what they would like to learn about a topic beyond what they have learned and to read in order to learn more about it. Books were distributed that would provide children with more information about what they were interested in learning. This intervention also involved having children choose what they read about and encouraging them to share what they had learned with other students (Wigfield et al., 2004).

The second intervention that was evaluated was called "Strategy Instruction" (Wigfield et al., 2004, p. 304) and it lasted for an hour and a half each day. The main focus in this intervention was on the strategies described above, and the approach was to teach the children "the attributes of competence in performing the strategy, awareness of when and how to use each strategy, and self-initiation of the strategy to assure sustained self-regulation of effective reading" (Wigfield et al, 2004, p. 302). This intervention did not involve the other components described with the first intervention. Using a pretest-posttest design, children in both interventions completed questionnaires regarding their reading self-efficacy and motivation and questionnaires regarding how often they read. Results indicated that children in the "Concept-Oriented Reading Instruction" (Wigfield et al., 2004, p. 304) intervention had significant increases their self-reported levels of intrinsic motivation, whereas the students in the "Strategy Instruction" (Wigfield et al., 2004, p. 304) intervention did not. Similarly, although students in the "Strategy Instruction" (Wigfield et al., 2004, p. 304) intervention did not have significant increases in reading self-efficacy from pretest to posttest, the students in the "Concept-Oriented Reading Instruction" (Wigfield et al., 2004, p. 304) intervention showed significant

increases in their level of self-efficacy for reading. Students in both interventions had significant increases in how often they read as well (Wigfield et al., 2004, p. 304). A few qualities of the "Concept-Oriented Reading Instruction" (Wigfield et al., 2004, p. 304) intervention that the authors claimed may have helped to increase student motivation "include the provision of interesting texts, autonomy support for reading, and opportunities to collaborate with other students during reading" (p. 307). The authors also suggest that the children's self-efficacy may have increased more in the "Concept-Oriented Reading Instruction" (Wigfield et al., 2004, p. 304) intervention than in the "Strategy Instruction" (Wigfield et al., 2004, p. 304) intervention because "children's self-efficacy and intrinsic motivation are related" (Harter, 1982, Wigfield & Guthrie, 1997, as cited in Wigfield et al., 2004, p. 307).

In regards to attitudes about reading, or motivation for reading, one way to measure this construct may be to see how much the children read outside of mandatory school reading, and Kim et al. (2010) reported that after participating in the READ 180® intervention, intervention participants reported reading significantly more often than the control group. Kim et al. (2010) reported that on average, the children who took part in the intervention stated that they read books approximately three to four days each week whereas children in the control group reported that they spent time reading books approximately one day per week.

Current Study: Research Questions and Hypotheses

The purpose of the study was to develop, implement, and evaluate a literacy intervention, called Better Reading for School Success (BRSS), for at-risk children in Grades 3 to 6, as part of a larger literacy intervention that involved the entire family

(parents and/or guardians in all cases, and younger siblings in some cases). The larger family based interventions were offered by Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). In this study, *at-risk* was defined as having an increased chance of struggling in school and falling behind the grade-level expectations, which can often occur when children are attending a school in which there are many families with low SES and/or low literacy levels (Moore et al., 2006), or when English is not the main language used in their home (Rush & Vitale, 1994). The study had a pretest-posttest 'business as usual' control group design. The BRSS intervention proposed for this study focused mainly on two key components: a) vocabulary and b) reading comprehension, although all other literacy components discussed in the Literacy Interventions section of the literature review were evaluated as well. Furthermore, another goal of the program was to help increase the children's reading and writing self-efficacy, and their attitudes toward reading by providing a positive, encouraging, and motivational learning environment while showing that literacy development could occur in recreational, enjoyable ways. Due to difficulty recruiting enough participants within the Project READ programs, the BRSS was also offered on its own along with a literacy workshop and weekly literacy development tips. The goal was to find greater improvements over time in the children who participated in the BRSS program while their families participated in the programs by Project READ (PR/BRSS program; Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and for children who took part in the BRSS intervention on its own (BRSS program) than for control group participants who did not participate in the BRSS program and whose families were not involved in the Project READ programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). The

conditions in this study are summarized in **Figure 1** and are described further in the Methods section.

There were three main research questions for the study which are provided next, along with two secondary questions related to the first research question. Related hypotheses are also presented:

1a) Can an enrichment-type hands-on literacy intervention afterschool program, such as the BRSS program for children in Grades 3 to 6, offered along with a family literacy intervention (Hewitt & Davis, in press; Kelland & Wasielewski, 2011), or on its own with minor family involvement, lead to significant improvements for children in the intervention over those of children in the control group on measures of reading comprehension, vocabulary, reading fluency, reading accuracy, phonological processing, and verbal fluency? It was hypothesized that the intervention groups in Grades 3 to 6 will improve more on each of measures during the intervention period than the control group of children in Grades 3 to 6.

1b) Will the inclusion of SES as a covariate influence the results when changes in scores on literacy skill measures are compared across groups? It was hypothesized that the inclusion of SES would significantly influence the results in these analyses.

1c) How are scores on the literacy measures related? It was expected that higher performance on each measure would be related to higher performance on the other measures.

2) Can an enrichment-type hands-on literacy intervention afterschool program, such as the BRSS program for children in Grades 3 to 6, offered along with a family literacy intervention (Hewitt & Davis, in press; Kelland & Wasielewski, 2011), or on its

own with minor family involvement lead to significant improvements in self-efficacy and attitudes toward reading for children in Grades 3 to 6 over a control group? It was hypothesized that both self-efficacy and attitudes toward reading will improve significantly more for the intervention children in Grades 3 to 6 than for the control group of children in Grades 3 to 6.

3) What types of trends may occur during the interventions regarding how involved parents and/or guardians are in their children's literacy development, and how communicative these parents and/or guardians are with their children's schools? It was hypothesized that the families involved in either intervention condition would become more involved with their children's school experiences and more communicative with personnel at their children's schools over time.

Method

Participants

The PR/BRSS intervention was offered at two elementary schools (School A in Fall 2012; School B in Spring 2013) in low-income areas of the Waterloo Region as well as at a food bank (Fall 2013) in the Waterloo Region. The BRSS intervention was also offered on its own, along with a parent/guardian workshop and weekly literacy development tips at another elementary school (School D in Fall 2013) in a low-income area of the Waterloo Region. In Spring 2013, intervention and control participants were also recruited from another Waterloo Region school in an area of low SES (School C) in order to increase enrollment. In Fall 2013, control group participants were also recruited from School C in order to increase participant numbers. In the Fall of 2012, only students in Grades 4 to 6 were recruited for the study, but in subsequent terms, students in

Grades 3 to 6 were recruited because the BRSS was appropriate for their age group and it would allow increased sample sizes. **Figure 1** summarizes the conditions in the current study.

Informed consent was obtained from all principals of schools at which participants were recruited. In addition, informed consent was obtained from Project READ, the food bank, and all parents and/or guardians of participating families. A sample invitation letter for the intervention group parents and/or guardians is available in **Appendix A**. A sample consent form for the intervention group parents and/or guardians is available in **Appendix B**. Minor adjustments were made for each location and depending on the intervention condition. **Appendix C** displays a sample invitation letter for the control group parents and/or guardians and **Appendix D** contains a sample consent form for the parents and/or guardians of the control group. Verbal assent was obtained from the children themselves (see **Appendix E** for a sample verbal script for the intervention groups and **Appendix F** for a sample verbal script for the control group).

Participants in the intervention groups that were provided the BRSS and the programs by Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011; PR/BRSS programs) were recruited by staff of Project READ in collaboration with the principal and/or teachers of the school. To complete the recruitment for the intervention group, Project READ provided their registration form/flyer (Project READ, 2012-2013a; see sample in **Appendix G**) to the school to be sent home with all students in the school. After the families who were interested in participating in the programs returned their form/flyers, Project READ staff discussed with the principal and teachers of the school which families were most likely to benefit most from the program and Project READ

offered those families spaces in the program. Approximately 10 to 15 families were recruited at each school and at the food bank by Project READ.

When the BRSS program was run on its own, recruitment occurred by posting an invitation to families on the school's website, research team members attending a Parent-Teacher Night with consent packages, and the teachers sending home consent packages with children who were considered at-risk. Control group students were also recruited by asking teachers to send home consent forms with students who were at similar literacy and academic levels as the intervention participants, but who were not attending either of the intervention programs.

Response rates are available in **Table 1**. The approximate number of students in the grades being recruited for the study are reported, as well as the number of children in those grades who attended the intervention. In addition, **Table 1** notes the number of control group consent forms that were sent home and the percentage of these forms that were returned at each time period. The sample sizes for each group were small. Total number of potential participants in Grades 3 to 6 was not available for the Food Bank location because it was open to a variety of clients at the food bank. All families were invited to take part in the interventions. The researchers do not have access to the full lists of people who requested a spot in the program but did not get offered a spot with Project READ. In the BRSS program, all children who returned consent packages were admitted. Consents for control group were only sent to a subset of students after time to return intervention consent packages was allowed, and numbers are estimated because consent forms were given to schools but they may not have distributed all of them.

It should be noted that three participants were removed from the data prior to data

analysis but were allowed to participate in the programs, testing, and questionnaires, and were still provided the compensation for participation in the study which was a $15.00 gift card and a book. Two of these participants were removed from the PR/BRSS program (Fall Spring 2013 at School B) based on not meeting the attendance rate criteria, which included having to attend at least 5 sessions out of 10. These 2 participants attended only 3 sessions and their families reported other commitments in the community such as sports, and community activities, as a reason. In addition, 1 child was removed from the BRSS program that was offered without Project READ (Fall 2013) because partway through the program sessions the child reported major home stress and had difficulty focusing during the intervention and particularly during posttesting. No participants had to be removed from the study based on indications of developmental delays or lack of phonological awareness at pretest. One child who took part in the PR/BRSS program at the food bank did not take part in the study because the parents and/or guardians did not provide consent. The final samples included 11 participants in the PR/BRSS programs, 13 participants in the BRSS program (for a total of 24 participants in the overall intervention group), and 20 participants in the control group. In the PR/BRSS programs, the average age was 121.00 months (*SD* =11.08; 2 Grade 3 students, 4 Grade 4 students, 3 Grade 5 students, and 2 Grade 6 students). In the BRSS program, the average age was 107.15 months (*SD* = 11.25; 7 Grade 3 students, 4 Grade 4 students, 1 Grade 5 student, and 1 Grade 6 student). Of 12 parents and guardians who responded regarding whether they were born in Canada, 3 said they were not (ages of arrival = 22, 36, and 38 years) and 9 said they were; this information was not available from the parents and guardians of the PR/BRSS group. In the control group the average

age of the participants was 118.30 months (*SD* =10.78; 2 Grade 3 students, 10 Grade 4 students, 4 Grade 5 students, and 4 Grade 6 students). In the control group, of 19 parents and guardians who responded regarding whether they were born in Canada, 8 said they were not (ages of arrival = 3, 6 (2 participants), 7.50, 8, 24, 26, and 30). Finally, in the PR/BRSS group, there were 7 boys (63.64%), in the BRSS group there were 5 boys (38.46%), and in the control group there were 12 boys (60.00%).

A one-way analysis of variance (ANOVA) was carried out to evaluate whether there were significant differences in the average age of participants in each group, which revealed that there were significant differences, $F(2, 41) = 5.77$, $p = .006$. Post-hoc LSD tests were used because they are fairly liberal and would allow any possible differences to be detected despite the small sample sizes and the lack of statistical power. The post-hoc LSD tests indicated that the BRSS group's average age was significantly lower than the average age of the PR/BRSS group ($p = .004$), and significantly lower than the average age of the control group ($p = .007$), whereas there was no significant difference between the average age of the PR/BRSS group and the control group ($p = .517$). These age differences may have affected the results, as will be explained in the Discussion section.

Of 13 participants in the BRSS group, 4 reported that there was another language other than English spoken at home. Of the 20 participants in the control group, 18 responded about whether another language (other than English) was used in the home. Of those participants, 5 reported that there was another language other than English spoken at home. The number of children who were from families in which another language other than English was spoken in the home was not available for the PR/BRSS group based on parent/guardian reports.[1] However, 4 children told the research team that

[1] Project READ staff asked the research team not to distribute the Demographic Questionnaires (adapted from Van Andel, 2011) or the Activity Choice Questionnaires (Grant, 2007) to the parents and/or guardians of the PR/BRSS group due to concerns about requesting the participants to complete too much paperwork.

they spoke another language at home. All children were considered "at-risk" and were from areas of low SES. Project READ staff have had years of experience offering support to families of low SES and to adults who have low literacy levels and are often unemployed; therefore, Project READ staff was helpful in identifying low SES areas in the Waterloo Region. **Table 2** displays background information about the families in the BRSS and control groups from the Demographic Questionnaire (adapted from Van Andel, 2011) at pretest.[1] This information was obtained orally from some participants in the PR/BRSS group. One parent/guardian in the PR/BRSS group orally provided their education level, which was a 7.00 for education level on Hollingshead's (1975) scale. Hollingshead's (1975) scales are described in detail under the Measures and Results sections. A score of 7.00 indicates "Graduate professional training (graduate degree)" (Hollingshead, 1975, p. 26). As seen in **Table 2**, the educational levels were quite similar across the PR/BRSS and control groups. In Spring 2013, the Project READ mid and final program evaluations (Project READ, 2012-2013b) which all parents and/or guardians who attended were asked to complete also included a question about their educational levels, and the median value based on Hollingshead's (1975) scale was 6.25 (n =12, IQR= 2.00). In Fall 2013 (at the Food Bank), it was 5.00 (n = 9, IQR = 3.50), based on the Project READ questionnaires (Project READ, 2012- 2013b). A value of 6 indicates "Standard college of university graduation" (Hollingshead, 1975, p. 26). A value of 5 indicates "Partial college (at least one year) or specialized training" (Hollingshead, 1975, p. 26). Therefore, in terms of education, it appears that the groups were all fairly similar in terms of educational levels.

However, the occupational statuses varied a bit between the groups. There were 5

parents and/or guardians in the PR/BRSS group that provided occupation information orally, and the median Hollingshead (1975) was 5.00 (IQR = 3.50). According to Hollingshead (1975), a value of 5.00 indicates the level of "Clerical and Sales Workers, Small Farm and Business Owners" (Hollingshead, 1975, p. 32). As can be seen in **Table 2**, occupational statuses were quite different across groups, both in terms of the occupations held within Canada and occupations held in the previous country in which the parents and/or guardians lived (if applicable). Based on Hollingshead's (1975) scale, a value of 3 indicates "Machine Operators and Semiskilled Workers" (p. 37), a value of 6 indicates "Technicians, Semiprofessionals, Small Business Owners" (p. 31), and a value of 8 indicates "Administrators, Lesser Professionals, Proprietors of Medium-Sized Businesses" (p. 28). The research team did not have access to information regarding whether any of the students had learning disorders or disabilities.

Table 3 displays responses regarding scale and numerical responses from the parents and/or guardians in the BRSS and control groups from the Demographic Questionnaires (adapted from Van Andel, 2011) and the Activity Choice Questionnaires (Grant, 2007) at pretest. **Table 4** displays the open-ended reports of who read with the child at home and what newspapers and magazines were read in the home, as reported in the Demographic Questionnaires (adapted from Van Andel, 2011) at pretest. The number of respondents falling into each category of types of newspapers and magazines is the number of respondents mentioning each type of newspaper and magazines at least once; this is why percentages add up to greater than 100.00% in some cases. There were 13 participants in the BRSS group and 20 participants in the control group. Frequency of Obtaining Newspapers options were 1 = *Daily*, 2 = *Three times a week*, 3 = *Once a week*,

and 4 = *Rarely*. Frequency of Obtaining Magazines options were 1 =*More than one time a week*, 2 = *Once a week*, 2.5 = *Once a month* (added by participant), 3 =*Rarely*, 3.5 = *Never* (added by participant). Frequency of Library Trips options were 1 = *Once a week*, 2 = *Twice a week*, 3 = *Once a month*, 3.5 = *Twice a month* (added by participant), 4= *Once a year*, 5 = *Never*. Number of Books from Library was reported as average value if parent and/or guardian reported a range. The item, Number Books Adults Own, was responded to on a scale of 1 = *None*, 2 = *From 1-5*, 3 = *From 5-10*, 4 = *From 10-25*, 5 = *25 or more*. The items, How Often Read to Child was on a scale of 1 = *Daily*, 2 = *5 times a week*, 3 = *3 times a week*, 4 = *Once a week*, so lower scores meant they read with their child more often. The item, Number Books Children Own, was on a scale of 1 = *None*, 2 = *From 1-5*, 3 = *From 6 -10*, 4 = *From 10-25*, and 5 = *25 or more*. The items, Free Time Child Reads Often; Knowing How to Read is Very Important; During Free Time, Adults Read Often; and Adults Enjoy Reading were reported on a scale of 1 = *True*, 2 = *Somewhat true*, 3 = *Somewhat false*, and 4 = *False*. Activity Choice-Book refers to the numbers of times participants chose *read a book of my choice* on the Activity Choice Questionnaire (Grant, 2007) over the other options out of a total of 4 possible times.

Recent EQAO (2012b) results from testing completed in the 2011- 2012 school years indicate that approximately 61% of Waterloo Region District School Board Grade 3 students met or exceeded the Ontario standard for reading skills, and 69% met or did better than the Ontario writing standards. However, these results indicate that there were still 39% of Grade 3 students falling below Ontario standards for reading skills and 31% of Grade 3 students falling below the writing standards. In the Waterloo Region District School Board, there was some indication of improvement in Grade 6, although 26% of

Grade 6 students still fell below the Ontario standards for reading and 27% of Grade 6 students still failed to meet the Ontario standards for writing skills in the 2011-2012 school year (Education Quality and Accountability Office, 2012b).

Measures

Questionnaires.

Demographic questionnaire (adapted from Van Andel, 2011). The parents and/or guardians of both the BRSS and the control group were asked to complete a full Demographic Questionnaire (see **Appendix H**) at the beginning of the study when they completed the consent form, and they were asked to complete the shortened follow-up version of the Demographic Questionnaire (see only the section typed in italics in **Appendix H**) after the intervention period was complete.[1] These questionnaires provided important background information about the languages used in the families' households, the literacy environment in the children's homes, the ways that the families communicate with the children's schools, and the families' SES levels. The highest reported education and the reported occupations of the parents and/or guardians were coded based on the Hollingshead Four-Factor Index of Socioeconomic Status (Hollingshead, 1975), particularly the education scale and occupation scales. On both of these coding scheme scales, a lower number indicated a lower SES and a higher number on the scale indicates a higher SES (Hollingshead, 1975).

Activity choice questionnaire (Grant, 2007). The parents and/or guardians of the BRSS group and the control group were also asked to complete the activity choice questionnaire at the beginning of the study when they completed the consent form.[1] This questionnaire provided a measure of how much the parents and/or guardians focused on

reading at home by asking them to select which activity they were most likely to do out of 16 pairs of activities that were listed. This questionnaire can be seen in **Appendix I**.

Reading and writing self-efficacy questionnaire. This questionnaire was adapted from Shell, Colvin and Bruning (1995, p. 388; see **Appendix J**), and was used to evaluate changes over time in children's self-efficacy for reading and writing. The questionnaire was completed by the children in Grades 3 to 6 (both the intervention and control group children) at both pretest and posttest, along with the testing batteries. The questionnaire took approximately five minutes to complete each time. The trained research assistants who carried out the testing were encouraged to help the children understand the questions if they had difficulty. The original questionnaire by Shell et al. (1995) included 18 items and was separated into four subscales with coefficient alphas of .72, .62, .69, and .76. The adapted version used in this study included 12 items and the questionnaire had a pretest Cronbach's alpha of .87, which indicates good reliability (George & Mallery, 2003). No information regarding the validity of the scale was provided in the original article by Shell et al. (1995), but inspection of the questionnaire items in the adapted version (**Appendix J**) suggests that the questionnaire has high face validity.

Project READ's mid-program and final-program evaluation questionnaires (Project READ, 2012-2013b). As part of the Project READ programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011), a mid-program evaluation and a final program evaluation (Project READ, 2012-2013b) was completed by the parents and/or guardians involved in the intervention; the questionnaires were completed in the adult room during the Project READ section of the programs (Hewitt & Davis, in press; Kelland &

Wasielewski, 2011). This questionnaire was not completed by the control group parents and/or guardians. Important feedback about the overall Project READ programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and the BRSS program was obtained using these questionnaires, along with self-reports regarding how the parents and/or guardians felt about their abilities to connect with their child(ren)'s school and to support their child(ren)'s literacy skill development. In addition, some demographic information was obtained in the evaluations, such as information pertaining to the SES of the families. These evaluations were property of Project READ (2012-2013b) and therefore are not included here.

Children's weekly reading and homework questionnaires. During each intervention session (although some questionnaires were missed in Week 1 due to registration and late registration), children in the intervention groups of the study were asked to complete the Children's Weekly Reading and Homework Questionnaires. These questionnaires provided important information about how much time the children spent on homework and reading over time, as an indicator of their motivation or attitudes toward reading. The facilitators of the BRSS program helped the children to understand the questions on these questionnaires if needed. This questionnaire can be seen in **Appendix K**.

Testing battery measures. The following section provides descriptions of each of the testing battery measures. **Table 5** provides a summary of which of these measures were completed at pretest only and those that were completed at both pretest and posttest.

Non-verbal intelligence.

Matrix Analogies Test –Expanded Form (MAT-EF) (Naglieri, 1985). Two

subtests from the MAT-EF (Naglieri, 1985) were used to screen for broadly normal intelligence. These tests were administered during the pretest only so that the scores of any participants that indicated that the child may be severely developmentally delayed could be removed from the study. In particular, subtest two, Reasoning by Analogy, and subtest four, Spatial Visualization (Naglieri, 1985) were used to evaluate the children's non-verbal intelligence. However, none of the scores obtained by the participants indicated severe developmental delays so none of the participants were removed from the study based on this task. This task took approximately 15 minutes for the participants to complete and involved viewing 16 pages with patterns in each subtest, for a total of 32 pages. Each page displayed the start of a pattern involving three, five, or eight shapes in the pattern, and participants were asked to decide which one of six shapes shown at the bottom of the page would complete the pattern. There was only one correct answer per pattern page, and the task was then scored by marking each response to indicate whether it was correct. The total number of correct responses was recorded for each subtest (Naglieri, 1985). Although the MAT-EF (Naglieri, 1985) was designed to be administered individually with the participant stating or indicating their chosen answer by pointing a finger, to help make testing efficient, children completed this task in a small group and viewed the pages on a laptop screen while circling their own answers on their answer sheets.

The MAT-EF (Naglieri, 1985) was standardized in the United States with individuals from the age of 5 to the age of 17, who were fairly representative of the various regions, ethnicities, and sex ratios present in the United States at the time. Naglieri (1985) reported that for children in Grades 3, 4, 5, and 6, the test-rest reliability

was *r* = .86, .91, .78, and .73, respectively, for the entire MAT-EF (all four subtests) after four weeks. After four weeks, the overall test-retest reliability for students in Grade 5 for subtest two was *r* = .40, and for subtest four it was *r* = .67 (Naglieri, 1985). Regarding internal consistency, for children aged 5 to 17, the median Cronbach's alpha value was .93. The internal consistency for children ages 8, 9, 10, 11, and 12 was .81, .77, .71, .71, and .81, respectively, for subtest two, and was .88, .86, .87, .90, and .92, respectively, for subtest four (Naglieri, 1985).

Phonological awareness.

Comprehensive Test of Phonological Processing (CTOPP)- Elision subtest (Wagner, Torgesen & Rashotte, 1999). The Elision subtest of the CTOPP (Wagner et al., 1999) was used at pretest only to screen for phonological awareness so that any participants that could not complete at least three items correctly would be removed from the study due to a low level of basic phonological awareness. None of the participants had to be removed from the study based on this cut-off. This task is appropriate for all ages for which it is standardized, which includes ages 5 to 24 (Wagner et al., 1999). This test involved 20 word items that required the child to listen to a word and then tell the tester what word remains when a specific smaller word is removed from the initial word. Alternatively, some items required the participant to listen to a word, then remove one sound from within that word and tell the tester what word remained (Wagner et al., 1999). Wagner et al. (1999) described the following example: "For example, the examinee is instructed, 'Say *bold*.' After repeating 'bold,' the examinee was told, 'Now say *bold* without saying /b/.' The correct response is 'old'" (p. 10). This task took approximately three minutes to complete. Testing was stopped once the participant

responded incorrectly on three test items in a row. The raw score was calculated by adding up the number of correct responses out of 20.

The standardized norms for the entire CTOPP were developed with 1,656 people in a fairly representative sample from ages 5 to 24 in the United States (Wagner et al., 1999). The average Cronbach's alpha for the Elision subtest, as a measure of internal consistency, was .89 for all participants in the standardizing sample from ages 5 to 24, and ranged from .86 to .91 for children aged 8 to 12 (Wagner et al., 1999). Test-retest reliability over a period of no more than two weeks for ages 8 to 17 was $r = .79$ (Wagner et al., 1999).

Phonological processing speed.

Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Wagner et al., 1999). The CTOPP Rapid Letter Naming and Rapid Digit Naming subtests (Wagner et al., 1999) were administered at both pretest and posttest to test for phonological processing speed. This task involved asking the children to read rows of letters (for Rapid Letter Naming) or numbers (for Rapid Digit Naming) as quickly and accurately as they could (Wagner et al., 1999). Total administration time for these two subtests was approximately six minutes (three minutes per subtest). Instructions for this task indicated that the children should be shown practice letters or numbers before beginning the actual tasks and if they could not state the name of each letter or number on the practice sheet after they had been given feedback, then the task should not be carried out (Wagner et al., 1999); however, this did not occur with the participants in this study. Participants completed both Form A and B. With each subtest and each form, participants were timed and the number of errors made

was recorded. One error was recorded each time a participant named a letter or number incorrectly or if they missed a letter or number. The raw score was recorded as the amount of time (in seconds) taken to complete each form, which meant that higher scores indicated worse performance. These subtests were appropriate for participants aged 7 to 24, and can be used as extra tasks for children ages 5 and 6 when they are completing other more age-appropriate tests of phonological processing (Wagner et al., 1999).

For the Rapid Letter Naming subtest, the Cronbach's alpha results had an average of .82 for ages 5 to 24 from the entire standardizing sample, and a range of .73 to .87 for ages 8 to 12 (Wagner et al., 1999). For the Rapid Digit Naming subtest, the Cronbach's alpha results had an average of .87 for the entire standardizing sample, and a range of .83 to .96 for those in the age group of 8 to 12 (Wagner et al., 1999). Finally, over a period of two weeks or less, test-retest reliability was also fairly high (Wagner et al., 1999). For Rapid Letter Naming, based on a group of 30 participants of the ages 8 to 17, test-retest reliability was r = .72, and for Rapid Digit Naming, for a group of 30 participants ages 8 to 17, test-retest reliability was r =.80 (Wagner et al., 1999).

Reading comprehension.

Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6 (GMRT; MacGinitie & MacGinitie, 1992). The Gates-MacGinitie Reading Test (2nd Canadian ed.)- Reading Comprehension subtest (GMRT; MacGinitie & MacGinitie, 1992) is a standardized test of reading comprehension that was completed by the participants at both pretest and posttest. For this study, form D, level 5/6 was used (MacGinitie & MacGinitie, 1992). This was a written task that was completed in a group setting, although participants were reminded not to share their

answers. This task consisted of 14 brief reading passages, and then each section of written text was followed by two to five multiple choice questions to answer about the reading section. In total, the task involved 48 multiple-choice questions. The participants were told that they had 35 minutes to complete this subtest (MacGinitie & MacGinitie, 1992). Before beginning the Reading Comprehension subtest of the GMRT (MacGinitie & MacGinitie, 1992), the participants were told that if they did not know an answer they should re-read the written section and then select the response they thought best answered the question. They were also informed that at the end they should double check their responses (MacGinitie & MacGinitie, 1992). The total time for administration, including providing the instructions, was approximately 40 minutes. The GMRT Reading Comprehension subtest was standardized using the test results from 40,000 students in Canada, and is considered a reliable measure of reading comprehension (Nelson Education Ltd., 2010-2011).

Vocabulary.

Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6 (GMRT; MacGinitie & MacGinitie, 1992). The Gates MacGinitie Reading Test (2nd Canadian ed.)- Vocabulary subtest (GMRT; MacGinitie & MacGinitie, 1992) is a standardized measure of vocabulary level that was completed at both pretest and posttest. For this study, form D level 5/6 was used (MacGinitie & MacGinitie, 1992). The task consisted of 45 items in which participants were asked to circle the meaning of the underlined word in a sentence or phrase from five multiple-choice options. This task was a written one that was completed in groups after participants were reminded not to share their answers. The participants were informed that if they did not know an answer, they

should re-read the sentence or phrase and then select the answer they thought may be correct. The time allowed for this task was 20 minutes, which participants were informed of, and participants were asked to stop at the end and then take time to double check their responses. The total time for administration, including giving instructions, was approximately 25 minutes. To standardize the GMRT (MacGinitie & MacGinitie, 1992), the norms were based on results of approximately 40,000 students living in Canada, and the Vocabulary subtest is considered a reliable measure of vocabulary level (Nelson Education Ltd., 2010-2011).

Reading fluency.

Test of Word Reading Efficiency (TOWRE)- Sight Word Efficiency and Phonemic Decoding Efficiency subtests (Torgesen, Wagner, & Rashotte, 1999). The TOWRE Sight Word Efficiency and Phonemic Decoding subtests are measures of word reading fluency (Torgesen et al., 1999), which were completed at both pretest and posttest. The Sight Word Efficiency subtest required the participants to read as many actual words out loud in a 45 second time period as they could (Torgesen, et al., 1999). The Phonemic Decoding Efficiency subtest required participants to read as many non-words (words that have been made up but were still able to be pronounced in the English language) in a 45 second time period as they could (Torgesen, et al., 1999). To administer both subtests it took approximately six minutes in total (approximately three minutes per subtest). The raw scores for both of these TOWRE subtests were the total number of words read correctly in 45 seconds; if words were read incorrectly, they were not counted (Torgesen et al., 1999). If a participant finished all words before the time was up, the time to finish was noted on the scoring sheet. Any words that were missed were counted as incorrect

and if participants took four or more seconds on any one word then they were told to go on and that word was marked as an error (Torgesen et al., 1999).

These TOWRE subtests were standardized based on a sample of 1 507 people ages 6 to 24 in the United States (Torgesen et al., 1999). The Sight Word Efficiency subtest (Form A), test-retest reliability for no more than a two week time period was .97 for 6 to 9 (n = 29) year olds, and .84 for 10 to 18 year olds. In addition, for the Phonemic Decoding Efficiency subtest (Form A), the test-retest reliability for no more than a two week time period for ages 6 to 9 was .90 and for ages 10 to 18 (n = 17), it was .89 (Torgesen et al., 1999).

Reading accuracy.

Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack and Word Identification subtests (Woodcock, 1987). The WRMT-R Word Attack subtest is a standardized measure of participants' reading accuracy, and in particular, of their decoding accuracy (Woodcock, 1987), which was completed at both pretest and posttest. This task involved having participants read made-up words that were pronounceable. Total administration of this task took approximately three minutes. The task was not timed, and the participants read across the rows of non-words on each page. Once a participant made six consecutive errors, starting from the last non-word and counting backward on the same page of words, the task was stopped. The raw score was calculated by counting all of the correctly pronounced non-words that the participant completed before the task was stopped (Woodcock, 1987). WRMT-R subtests have an internal reliability (i.e., split-half reliability) of .68 to .98, with a median split-half reliability of .91, according to normative updates that were carried out in the 1990s

(Pearson Clinical Assessments, 2012).

The WRMT-R Word Identification subtest is a standardized measure of a participants' word reading accuracy (Woodcock, 1987), which was also completed at both pretest and posttest. This task required participants to read pages of words similarly to the WRMT-R Word Attack subtest (Woodcock, 1987), except that the words in the Word Identification subtest were real words. Total administration of the WRMT-R Word Identification subtest (Woodcock, 1987) took approximately three minutes. This task was not timed, and participants were asked to read the real words across the rows on each page, with the task being stopped when they made six errors on the same word page starting from the last word on the page and counting backwards. The raw score consisted of the total number of correctly read real words before the task was stopped. This subtest of the WRMT-R (Woodcock, 1987) also has a reported split-half reliability median value of .91, and of all subtests in the WRMT-R, the split-half reliability ranges from .68 to .98, according to updated norms developed in the 1990s (Pearson Clinical Assessments, 2012).

Verbal fluency.

Oral Naming Fluency Task (English and first language, if applicable) (adapted from Gollan, Montoya, & Werner, 2002). The Oral Naming Fluency Task (adapted from Gollan et al., 2002) was the only experimental (non-standardized) measure of oral language skills that was used in the study, and it was used as a measure of verbal fluency. This task was completed at both pretest and posttest by all participants in English, and was completed in the first language of any participants for whom English is not their first language and who felt comfortable using the language for the task. This task involved

timing the participants for 60 seconds during which children were instructed to list as many items in a given category as they could (Gollan et al., 2002). There were a total of six categories in English, and the same categories were completed in the participants' first language (if applicable), for a total administration time of approximately 8 minutes for each language in which the task was completed. The six categories for this task included: animals, clothing, colours, fruits and vegetables, sports, and things with wheels.

Prior to beginning the task, instructions similar to those used by Gollan et al. (2002) were given to the children. Children were told to name as many items as they could in the 60 seconds allotted for the category, and category reminder sheets were placed in front of the children in case they forgot which category was being completed. The children were also told that they should not use proper nouns, or the same word but with a suffix added, such as using both "run" and "running." They were instructed not to repeat words because they only counted once (adapted from Gollan et al., 2002). The items named by participants were recorded on a sheet by the tester, but were also recorded as audio files so that the items named could be double checked later on. For the first language version, testers wrote down the language being used by the child on the recording sheets, and the audio files were translated by volunteer research assistants in the lab afterward. The scores included the total number of items stated, the number of items that were repeated, the number of items named that did not fit into the category, and finally, the final score of all correct items (not including repeated items).

Procedure

Ethics approval was obtained from Wilfrid Laurier University and from the Waterloo Region District School Board for this study. Informed consent was obtained as

described in the Participants section. Project READ staff allowed the researchers to access some information from their pre- and mid- program evaluations (Project READ, 2012-2013b).[1] Project READ staff also allowed the researchers to include certain questions in these evaluations that allowed the research team to collect demographic information and information about the parents' and/or guardians' confidence level for communicating with the schools. However, parents and/or guardians of children in the BRSS group and the control groups completed the full Demographic Questionnaire (**Appendix H**), and the Activity Choice Questionnaire (**Appendix I)** at pretest.

For children who attended the intervention at schools and for children in the control group, pretesting was scheduled by contacting the participants' principals and/or teachers. All testing was carried out by trained upper-level undergraduate students or graduate students. The testing was carried out either during nutrition breaks or during instructional school hours, or both, depending on the preferences of the principals and teachers. However, for children who participated within the program at the food bank, testing was carried out at the food bank at a time that worked for their parents and/or guardians to meet the testers. Pretesting took approximately two hours to complete, and the measures were completed in random order, depending on factors such as material availability and time constraints. Due to holidays, field trips, working around schedules of the school, teachers, and children, and children who were registered for the program after it began, pretesting was completed from 2 days before the first program to 28 days after the first program. The measures used at pretest that were carried out individually included the experimental task called the Oral Naming Fluency Task (adapted from Gollan et al., 2002) in both English as well as in another language that was spoken in the

child's home, if there was one; as well as Woodcock Reading Mastery Test-Revised – Word Attack and Word Identification subtests (WRMT-R; Woodcock, 1987); Comprehensive Test of Phonological Processing-Rapid Letter Naming, Rapid Digit Naming, and Elision subtests (CTOPP; Wagner et al., 1999); and Test of Word Reading Efficiency – Sight Word Efficiency and Phonemic Decoding subtests (TOWRE; Torgesen et al., 1999). The measures that were completed as part of the pretesting testing battery in a group setting included the Gates-MacGinitie Reading Test- Reading Comprehension and Vocabulary subtests (GMRT; MacGinitie & MacGinitie, 1992); as well as subtest two, Reasoning by Analogy, and subtest four, Spatial Visualization, of the Matrix Analogies Test-Expanded Form (MAT-EF; Naglieri, 1985). Participants were reminded not to share any of their answers with others. In addition, participants in both the intervention and control groups were asked to complete the Reading and Writing Self-Efficacy Questionnaire (adapted from Shell et al., 1995, p. 388; see **Appendix J**). The pretesting battery was carried out in one or multiple sessions to avoid fatigue effects, and this varied depending on each child's level of focus and the time allotted for testing. Each participant was provided with a designer pencil (a pencil with designs on it) after they completed the pretesting battery.

The intervention was then carried out. The BRSS was either offered as a subsection of a literacy program by Project READ, which was either the 'Get Set Learn Afterschool' (GSLA) program (Kelland & Wasielewski, 2011) in the Fall of 2012 and Spring of 2013, or the 'Get Set Learn-Together with Grandparents' (GSL-TG) program (Hewitt & Davis, in press) in the Fall of 2013. In the Fall of 2013, the BRSS was also offered on its own with only the children in attendance. When the intervention was

offered on its own (BRSS program), the parents and/or guardians were involved through the literacy workshop offered 13 days after the first intervention program, and weekly literacy tips (see **Appendix L**; adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007), which were emailed to the families and handed out in hard copy as well. All literacy tips were summarized for the families in a larger email/handout that was given to the parents and/or guardians during the last couple of weeks of the program.

The GSLA (Kelland & Wasielewski, 2011) and the GSL-TG (Hewitt & Davis, in press) programs were both offered for 10 weeks, once per week for two hours. The GSLA was offered immediately afterschool (Kelland & Wasielewski, 2011) and the GSL-TG was offered from 5:30 to 7:30 p.m. at a local food bank (Hewitt & Davis, in press). Both were designed to help entire families overcome literacy struggles (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). The BRSS program was designed by Dr. Alexandra Gottardo and Melissa Dol based on the Ontario curriculum (Ministry of Education, 2006), ideas from the program manual for a different program for students in Grades 9 to 12 from which the current program was adapted (Pasquarella, Fraser, Kornacki, Iwenofu, Azimi, Farnia, & Geva, 2013), a previously conducted undergraduate thesis that reported strategies that were used in a literacy intervention program (Cave, 2012), and a presentation regarding effective strategies for promoting reading comprehension (Gottardo, n.d.). In addition, suggestions for best-practices for promoting literacy development were taken from the literature (Hilden & Pressley, 2007; Rosenshine, 2012). All activities were designed to be appropriate for children in Grades 3 to 6 who were struggling with literacy skills, while including activities and materials

that were popular with children, such as children's magazine ads, a popular children's book, and fun hands-on activities including short literacy and science activities.

During the PR/BRSS programs, the intervention group children in Grades 3 to 6 (or Grades 4 to 6 in the program offered in Fall 2012), attended the GSLA (Kelland & Wasielewski, 2011) or the GSL-TG (Hewitt & Davis, in press) for the first hour of each session and the BRSS program for the second hour, whereas their families attended only the program by Project READ for the full two hours. This first hour in Project READ's programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) involved literacy-promoting activities such as word games, challenges, and puzzles, which were completed together by the families and facilitators. During this first hour with the families together, Project READ's programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) also included time included for the families to have a free snack or meal together. After approximately the first 45 to 50 minutes, the infants up to Junior Kindergarten students were brought to one classroom by Early Childhood Educators, and the adults met with an expert in adult education in another room. The students in Senior Kindergarten to Grade 6 played active games for approximately 10 to 15 minutes. Examples of games included Freeze Tag, Simon Says, and relay races. After the active games, the children in lower elementary grades met in one room whereas the children in Grades 3 to 6 (or Grades 4 to 6 during the program offered in Fall 2012) met with the research team facilitators in another room for the BRSS program. These research team facilitators consisted of trained upper-year undergraduate and graduate students.

When the BRSS child intervention was run on its own, the intervention lasted for approximately one hour and 5 minutes. Children met with research team facilitators at a

classroom in their school after the end-of-day bell rang. Snack was served and the same lesson plans as those used during the BRSS offered within the Project READ programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) were used in this program.

A sample of a lesson plan for one session can be seen in **Appendix M.** It should be noted that during the first week of the PR/BRSS programs, the families in the intervention were asked to sign up for the study, so the BRSS literacy intervention was not started until Week 2. However, during the Week 1 orientation session, GSLA (Kelland & Wasielewski, 2011) and GSL-TG (Hewitt & Davis, in press) literacy activities were still carried out, but the families were also shown to each of the rooms in which the groups at the program would be meeting, and they also met the facilitators of each group, which was an important step in order to build a positive rapport with the families. At each room, children worked with parents and/or guardians and their siblings (if they had siblings attending the program) to complete an activity that allowed the facilitators to get to know about the families. For example, one activity involved creating a placemat with images depicting activities the child liked to do with their family or interests of each family member. When the BRSS program was run on its own, similar activities were carried out to allow the participants and facilitators to get to know one another.

The BRSS program, when offered with the programs by Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and on its own, focused on different literacy strategies and skills each week and was organized around a popular children's novel by Judy Blume (1980/2007) called *Superfudge*. This book was selected based on children's top three choices from a list of popular children's novels that was distributed to

children who attended the first PR/BRSS program. Weekly reading was assigned for the children to do at home. One to two chapters were assigned each week. The children were asked to bring these books back with them to the BRSS program each week and at the end of the program they were allowed to take the book home with them to keep. In addition, during the first week each participant in the BRSS section of the program received an activity supply bag, which contained items such as pencils, erasers, a highlighter, a notepad, and markers. These activity supply bags were used each week by the children and they were sent home with the children on the last program day.

In regards to the focus of each BRSS lesson, in Week 2, the lesson focused on how to find the main idea in pieces of writing. In Week 3, the main lesson was on how to use the text surrounding an unknown word to determine the meaning of that word. Week 4 involved a lesson on media literacy and how to evaluate who the audience of an advertisement is, what the purpose and implicit messages of advertisements are, and important questions to ask oneself when viewing or reading advertisements. Week 5 focused on a lesson about how to scan pages for key information by asking the children to complete a crossword and providing them with page numbers to find the answers in their *Superfudge* (Blume, 1980/2007) books. The lesson for Week 6 was on synonyms and antonyms.

During Fall 2012, the GSLA program involved a trip to the local library on Week 7 for all attendees of the Project READ program, including the participants in Grades 3 to 6 who were in the BRSS program. This library trip involved a tour and crafts, and the chance to sign up for library cards (Kelland & Wasielewksi, 2011), so there were no specific BRSS activities planned on this week. Week 8 then focused on root words and

how words can be changed using prefixes and suffixes. Week 9 involved a lesson about the important parts of a story and an activity that will involve creating comic strip stories. Finally, the lesson in Week 10 focused on organizing information learned when reading, or organizing information in a pre-writing process through the use of graphic organizers. During the Spring 2013 GSLA (Kelland & Wasielewksi, 2011) program, and all subsequent programs (including PR/BRSS programs and the BRSS on its own), Week 7 did not involve a trip to the library due to a decision to focus more on literacy activities themselves and to reduce costs. Therefore, during these programs, the original lessons for each week after Week 7 were shifted forward one week and additional activities were added for Week 10, which focused on homophones. Each week also included a hands-on science activity related to the literacy lesson and/or book (see sample lesson plan in **Appendix M**). Children were praised for effort and were often offered leadership opportunities to try to improve their confidence in their abilities. For example, children were sometimes asked to come to the front of the room to help introduce an activity to the class or to help organize materials for the lesson.

During the second hour of each GSLA (Kelland & Wasielewski, 2011), and GSL-TG (Hewitt & Davis, in press), when the research team met with the children in Grades 3 to 6 (or Grades 4 to 6 in Fall 2012), for the BRSS program the infants/ toddlers took part in activities to promote their development, such as singing songs, listening to stories, playing with blocks, doing crafts, and playing games. The younger elementary group also took part in literacy-based activities during the second hour, such as following craft recipes, doing relays, making bookmarks, writing, and games that helped to promote literacy. Finally, the adults worked with an expert in adult education to discuss

challenges they faced and ways that they can promote literacy at home. They also had guest speakers from community centres or resource centres and did hands-on activities that demonstrated how easy and enjoyable literacy activities could be (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). The GSL-TG (Hewitt & Davis, in press) was similar to the GSLA (Kelland & Wasielewski, 2011), except that all adult attendees at the GSL-TG were grandparents who had custody of their grandchildren or assisted in caring for their grandchildren, and topics were geared more toward concerns the older generation may have such as technology, and continuing stories and traditions within families (Hewitt & Davis, in press).

Attendance was recorded at each after-school program for children in Grades 3 to 6 who attended the BRSS program. In addition, children in Grades 3 to 6 were asked to fill out Children's Weekly Reading and Homework Questionnaires to indicate how much time they spent on reading and homework that week. The Children's Weekly Reading and Homework Questionnaire can be seen in **Appendix K.** During Week 1, children did not typically fill out the cards during the PR/BRSS programs because sign up was occurring, and days that the program was running behind, children did not always complete them. However, these questionnaires were collected for most weeks.

Posttesting began as soon as possible after the last week (Week 10) of PR/BRSS programs and BRSS programs. Similarly to the pretesting, the principal and/or teachers were contacted to determine times that worked best for them during school hours or nutrition breaks for the trained testers to meet with the participants. The children who participated at the food bank completed the testing at the food bank. Again, due to scheduling difficulties, posttesting was completed anywhere from 1 day after the last

program to 26 days after the last program. The posttesting battery consisted of all of the same tasks as the pretesting battery, except that the MAT-EF subtests (Naglieri, 1985) and the Elision subtest of the CTOPP (Wagner et al., 1999) were not completed at posttest. This posttesting battery took approximately one and a half hours, and was carried out in one to two sessions to help ensure that students could maintain attention throughout the testing and to reduce fatigue effects. The tests were carried out in random order similarly to the pretest. When the trained research team met with the participants in the intervention groups and control group for the posttesting battery, they also supplied the child with the shortened follow-up Demographic Questionnaire (adapted from Van Andel, 2011; see sections typed in italics in **Appendix H**) to take home for their parent and/or guardian to fill out and return to the school, or these were sent home with students by providing them to their teachers. Completed follow-up Demographic Questionnaires were collected from the school as they were returned. When the participants in both the intervention and control groups completed the posttesting battery, they were given a $15 gift card to a large chain of bookstores and were asked to sign a receipt that they received their compensation. They also received designer pencils when they completed sections of the posttesting battery.

The control group was in a no-exposure condition, meaning that the children in Grades 3 to 6 and their families did not attend the PR/BRSS programs or the BRSS program run on its own. However, after the last week of the literacy intervention programs (Week 10), a workshop was offered to the control group families at the school at which the interventions occurred. The control group families were invited to this workshop with an invitation letter that was sent home with the children in the control

group (see **Appendix N**). This workshop lasted approximately one hour after school and was conducted by Dr. Alexandra Gottardo who shared effective and enjoyable ways that the parents and/or guardians can help their children with literacy skills at home. While the parents and/or guardians were meeting with Dr. Alexandra Gottardo, Melissa Dol and facilitators did activities and crafts with their children.

Results

Overview

All data were analyzed using IBM SPSS Statistics Version 21.0 (IBM Corp., 2012), and all analyses were carried out after removing the three participants described in the Participants section. Although sample sizes were small, particularly, when considering the two intervention groups separately (with the PR/BRSS group and the BRSS group treated as separate groups), they were adequate for this exploratory study. Although some of the parametric tests described below may be better suited for larger sample sizes, inspections of the distributions indicated that the patterns in the data conformed closely enough to a normal distribution for parametric tests to be used. In addition, there were no floor or ceiling effects that would limit the data, so parametric tests were used to analyze the continuous variables (scores on measures, for example). However, due to the small sample sizes, all findings should be interpreted with caution. In addition, because results were similar whether original ANOVA results or the Welch's ANOVA results were reported, all original ANOVA results are reported in order to maintain consistency.

Research Question 1a: Influence of the Literacy Interventions on Reading Comprehension, Vocabulary, Reading Fluency, Reading Accuracy, Phonological

Processing, and Verbal Fluency

The first research question asked whether participants in the literacy interventions improved more on the literacy measures from pretest to posttest than participants in the control group. Means and standard deviations for all measures at pretest are displayed in Table 6. A visual inspection of **Table 6** suggests that the BRSS group tended to have lower scores on the measures at pretest than the PR/BRSS group and the control group, although the PR/BRSS group and the control group had similar scores at pretest. Means and standard deviations for all measures at posttest are displayed in **Table 7**, and means and standard deviations of difference scores are displayed in **Table 8**.

In **Tables 6, 7, and 8**, the means and standard deviations are reported separately for the PR/BRSS participants, the BRSS participants, and the control group participants, as well as for the two intervention groups (PR/BRSS and BRSS) together, and finally, for all participants from the three groups together. A visual comparison of the values in **Tables 6** and **7** indicates that there were some decreases in scores over time although the groups typically tended to improve on their scores over time. However, **Table 8** summarizes which groups improved on certain measures and which groups had worse scores at posttest on certain measures. Based on descriptive statistics of the difference scores provided in **Table 8**, it appears that the PR/BRSS mean increased on all measures except for the Oral Naming Fluency Task in English (adapted from Gollan et al., 2002), which showed a decrease in the average score. However, the BRSS group improved on their scores on all measures based on the means. Based only on the descriptive statistics in **Table 8**, the control group showed a decrease in the average score for their Gates-MacGinitie Reading Test – Reading Comprehension subtest (MacGinitie & MacGinitie,

1992), and the Test of Word Reading Efficiency- Phonemic Decoding subtest (Torgesen et al., 1999), whereas their average score for the Oral Naming Fluency Task (adapted from Gollan et al., 2002) in their first language did not change, and the rest of the means increased.

Because of the small sample sizes, separate one-way analysis of variance (ANOVA) tests were used to compare difference scores of the overall intervention group (PR/BRSS and BRSS combined) to the difference scores of the control group for each measure completed at both pretest and posttest. Because this was an exploratory study, difference scores were analyzed in order to simplify analyses and to avoid having very small numbers of participants in each cell, which may have been an issue in a mixed two-way analysis of variance with time and group as the factors, for example. Although a multivariate analysis of variance (MANOVA) could have been used to compare the groups' difference scores, due to the low power caused by the small sample sizes, it was decided that separate ANOVA tests should be used because they would be more likely to find any existing effects and therefore were suitable for this exploratory study. [2] Furthermore, a Bonferroni correction is often used when multiple statistical tests are carried out. However, it was also decided that, due to the exploratory nature of the study and the low power, this correction would not be used in this study. The corrected alpha based on a Bonferroni correction would have been .005 for each set of 10 ANOVA tests described below and presented in **Table 9**.

The results of the separate One-Way ANOVA tests comparing difference scores on the literacy measures for the overall intervention group (PR/BRSS and BRSS) and the control group are presented on the left side of **Table 9**. There was a significant

[2] A regression analysis also could have been used, but it was decided that a regression would not be used because the author was not interested in predictors of the development of literacy skills, but rather the author was interested in group differences.

difference between the difference scores for the overall intervention group (n = 24, M = 1.67, SD = 4.38) and the control group (n = 20, M = -1.20, SD = 5.07) on the Gates-MacGinitie Reading Test- Reading Comprehension subtest (MacGinitie & MacGinitie, 1992), $F(1, 42) = 4.05$, $p = .05$, $\eta^2 = .088$. The average difference score was higher (and therefore indicated greater improvement from pretest to posttest) for the overall intervention group than for the control group, and the eta squared value indicated that approximately 8.8% of variance in the comprehension scores was accounted for by the group (overall intervention versus control group). This was a medium effect size (Cohen, 1988). None of the other ANOVA tests comparing the overall intervention group and the control group were significant.

Next, in order to determine whether there were differences between the PR/BRSS intervention subgroup and the BRSS intervention subgroup, several One-Way ANOVA tests were used to compare the pretest, posttest, and difference scores for these two groups. ANOVA tests were used in order to keep reported statistics consistent. Results of these tests can be seen in **Table 10**. As can be seen in **Table 10**, the PR/BRSS and the BRSS groups had significantly different scores at pretest and posttest on almost all of the measures, and on Word Attack for the difference scores. For most measures at pretest and posttest, the PR/BRSS group performed better overall than the BRSS group. Because the two intervention groups were not equivalent at pretest, another set of One-Way ANOVA tests were carried out with each measure's difference score as the dependent variable and the group (based on three levels: PR/BRSS, BRSS, and control group) as the independent variable. Results of these tests are reported on the right side of **Table 9**.

As can be seen on the right side of **Table 9**, there was a significant effect of group (PR/BRSS, BRSS, and control) for the difference scores on the Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack subtest (Woodcock, 1987), $F(2, 41)= 4.94$, $p = .012$, $\eta^2 = .194$, and the eta squared value indicated that approximately 19.4% of the variance in difference scores on this test was accounted for by the group (PR/BRSS, BRSS, or control group). This was a very large effect (Cohen, 1988). Follow-up LSD post-hoc tests on the difference scores on the Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack subtest (Woodcock, 1987), indicated that the average difference score for the BRSS group ($n = 13$, $M = 6.62$, $SD = 5.66$) was significantly higher than the average difference score for the PR/BRSS group ($n = 11$, $M = 1.55$, $SD = 3.50$, $p = .021$) and significantly higher than the average difference score for the control group ($n = 20$, $M = 1.10$), $SD = 5.57$, $p = .005$). The average difference score for the PR/BRSS group did not differ significantly from the average difference score for the control group ($p = .820$).

Research Question 1b: SES as a Covariate

It was possible that the SES of the participants may have influenced the difference scores of the participants, so an SES covariate was calculated. The SES covariate was based on the Hollingshead Four-Factor Index of Socioeconomic Status (Hollingshead, 1975) scales for rating education and occupation. For the groups for which Demographic Questionnaire data or oral responses were collected regarding education or occupation information, this was recorded based on the Hollingshead Four-Factor Index of Socioeconomic Status (Hollingshead, 1975) scales, based on a 7-point point scale for education with higher values indicating higher education levels, and a 9-

point scale for occupation with higher scores indicating higher level occupations. However, the occupation scale was increased to a 10-point scale in order to include a 0 for parents and/or guardians who were unemployed. The reported occupations held in former countries were also recorded based on the same expanded 10-point scale that was used for current occupations.

For participants with missing data for the education variable, particularly for the PR/ BRSS programs for which the Demographic Questionnaire was not given to parents and/or guardians, information from Project READ's mid- and final- program evaluations (Project READ, 2012-2013b) was used. Project READ's (2012-2013b) evaluations were completed anonymously, so reported educational levels could not be traced to specific participants. In Fall 2012, no information was collected by Project READ regarding SES variables. However, for Spring 2013, the mean of all reported highest levels of education based on Hollingshead's (1975) education scale was given to all participants in the PR/BRSS Spring 2013 group, and for the Fall 2013 group, the same method was used with the mean of their questionnaire responses for the education variable. Any other participants with missing education data were given the mean of all of the education values after the means were entered for the Spring 2013 and Fall 2013 groups. Next, each scale rating on both the education and occupation scales was changed into an adjusted rating by increasing all values by one so that no participant had a value of zero. For participants who reported the occupation they had in the country they lived in previously, the average SES rating was determined by calculating the mean rating from the adjusted rating of their occupation in their previous country and the adjusted rating for their highest level of education attained. For the participants with no occupation in a

previous country reported, the average was taken from the adjusted rating for their current occupation and the adjusted rating for their highest level of education attained. Finally, for participants with missing data for the occupation variable (both in their previous country, if applicable, and their current occupation in Canada), the adjusted education rating was used as their overall SES score. Analyses comparing the difference scores on the literacy measures for the two groups (overall intervention versus control), and the three groups (PR/BRSS, BRSS, and control) were also carried out with this SES covariate in several analysis of covariance (ANCOVA) tests (see results in **Appendix O**), but the results were similar to the results obtained when the covariate was not included, so only the ANOVA test results without the covariate are discussed here for ease of interpretation and consistency with other reported results.

Research Question 1c: Relationships Between Scores on Literacy Skill Measures, and Between Scores on Measures and Age

Correlations between the scores on the pretest literacy measures for all groups are available in **Table 11**, on the posttest measures for all groups in **Table 12**, and on the difference scores for all groups in **Table 13**. **Table 13** also displays the correlations of age with the difference scores on literacy measures. Many of the measures were significantly correlated with one another at pretest and posttest, but significant correlations were rare between the difference scores. At pretest, many of the measures had significant positive correlations with one another, which was expected. However, the correlations between the Oral Naming Fluency Task in the first language (adapted from Gollan et al., 2002) and the other measures did not tend to be significant at pretest. The only tasks that had significant negative correlations with the other measures at pretest

were the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Wagner et al., 1999). Of course, these negative correlations were expected because the raw scores on the measures of phonological processing speed were the number of seconds to complete the task, with longer times indicating a worse performance and vice versa. On all other tasks, higher scores indicated better performance. Results were similar for the correlations between posttest measures.

Few correlations between the difference scores for the measures were significant. There was a large significant positive correlation between comprehension and vocabulary difference scores (r = .42, p =.005; Cohen, 1988). There was also a moderate significant positive correlation between the Woodcock Reading Mastery Test-Revised (WRMT-R) - Word Attack subtest (Woodcock, 1987) and the Test of Word Reading Efficiency (TOWRE)- Phonemic Decoding Efficiency subtest (Torgesen et al., 1999) (r =.34, p =.025; Cohen, 1988). In addition, there was a significant moderate negative relationship between the Test of Word Reading Efficiency (TOWRE)- Sight Word Efficiency subtest (Torgesen et al., 1999) and the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming subtest (Wagner et al., 1999) (r = -.32, p =.033; Cohen, 1988). Furthermore, there was a large significant positive correlation between the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Wagner et al., 1999) (r =.55, p <.001; Cohen, 1988), as well as very large significant positive correlations between the Oral Naming Fluency Task in the first language (adapted from Gollan et al., 2002) and the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming (r = .62, p = .040; Cohen,

1988) and Rapid Digit Naming subtests (Wagner et al., 1999) (r = .71, p = .015; Cohen, 1988).

Age was only found to be significantly negatively correlated with the Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack subtest (Woodcock, 1987) (r = -.30, p =.047), which was a moderate correlation (Cohen, 1988) and the Oral Naming Fluency Task in the first language (adapted from Gollan et al., 2002) (r = -.62, p = .040), which was a very large correlation (Cohen, 1988). However, age was not significantly correlated with any of the other difference scores on the measures; therefore, age was not used as a covariate in any analyses.

Research Question 2: Influence of the Literacy Interventions on Self-Efficacy and Attitudes Toward Reading

The second research question asked whether the intervention participants would have significant gains in their self-efficacy for literacy skills and attitudes toward reading throughout the intervention period. For the Reading and Writing Self-Efficacy Questionnaire (adapted from Shell et al., 1995, p. 388), an average self-efficacy score was calculated for each participant who completed this questionnaire at pretest and posttest. This average score was calculated by adding up all values selected on each of the 5-point Likert scales in the questionnaire, and dividing by 12, which is the number of items in the questionnaire. Wilcoxon signed-rank tests were used separately for each group to evaluate whether their self-efficacy had changed significantly from pretest to posttest. As an indicator of effect sizes, Horn (2008b) states, “For the Wilcoxon test, the mean positive ranked difference score and the mean negative ranked difference score could be reported” (p. 3). Therefore, these values are reported after each Wilcoxon

result. Because this questionnaire was added to the study after the first program had been carried out, some participants did not complete it, and the number of participants in each group that completed the questionnaire at pretest and posttest is reported as well. For the PR/BRSS group (n = 6, pretest SE median = 4.08, posttest SE median = 3.75), there was no significant difference from pretest to posttest, Z = -0.40, p = .686. The average positive rank (n = 3) was 3.00 and the average negative rank (n = 2) was also 3.00, with one tied rank.

For the BRSS group (n = 13, pretest SE median = 3.25; posttest SE median = 3.58), there was no significant difference from pretest and posttest, Z = -0.46, p = .648. The average positive rank (n = 7) was 7.43, and the average negative rank (n = 6) was 6.50, with no ties. Finally, for the control group (n = 9, pretest SE median = 4.00, posttest SE median = 4.33), there was also no significant difference from pretest to posttest, Z = -0.74, p = .458. The average positive rank (n = 3) was 4.67, and the average negative rank (n = 3) was 2.33, with three ties. **Figure 2** illustrates the median scores at pretest and posttest for each group.

As an indicator of the children's attitudes toward reading, the Children's Weekly Reading and Homework Questionnaires were completed by the participants that took part in the interventions. The control group participants did not complete the Children's Weekly Reading and Homework Questionnaires. The self-reported values on the questionnaires were analyzed separately for the PR/BRSS and the BRSS groups for each of the three questionnaire topics: a) how much time they spent reading for fun that week, b) how much time they spent reading for school that week, and c) how much time they spent on homework that week. Note that there was some missing data throughout the

weeks. Week 1 was not included in the analyses due to a large amount of missing data. During Week 1 the children were getting settled into the program or being signed up that week, so the Friedman tests were carried out with results from Weeks 2 to 10. As noted by Horn (2008a) regarding the reporting of effect sizes for the Friedman test, "SPSS computes Kendall's coefficient of concordance (Kendall's W), a strength-of-relationship index. The coefficient of concordance ranges from 0 to 1, with higher values indicating a stronger relationship" (p. 3). Therefore, Kendall's W values are reported as indicators of effect sizes. The numbers of participants included in the Friedman tests were quite low because few children had complete data sets for the questionnaire items from Week 2 to 10. For the PR/BRSS program, there were no significant differences over time in terms of the amount of time children reported reading for fun (n = 4), χ^2 (8) = 8.70, p =.369, Kendall's W = .272, the amount of time children reported reading for school (n = 4), χ^2 (8) = 3.73, p =.881, Kendall's W =.116, or the amount of time children reported doing homework (n = 4), χ^2 (8) = 3.79, p = .876, Kendall's W = .118. Similar results were found for the BRSS program, for which there were no significant differences over time for the amount of time children reported reading for fun, χ^2 (8) = 14.81, p = .063, Kendall's W = .617, or the amount of time children reported reading for school (n = 3), χ^2 (8) =10.37, p = .240, Kendall's W = .432, or the amount of time children reported doing homework (n = 4), χ^2 (8) = 9.36, p = .312, Kendall's W = .293. Analyzing both intervention conditions as one group (PR/BRSS and BRSS together) produced similar results so only separate results are reported here. There was one outlier in the BRSS group for the self-reported time spent reading for school on Week 7. The self-reported values for the BRSS group for this questionnaire item were 0 (*Did not read*) or 1 (½

hour) for all participants except for the outlier of 6 (*7+ hours*). However, the participant with the outlying value did not have a complete data set and was therefore not included in the Friedman test. Median values on the scales are reported in **Figure 4** for each week and the median for Week 7's reported time spent reading for school did not change when this outlying value was included. Therefore, the sample sizes reported in **Figure 4** and the data set used to determine the medians in **Figure 4** include this outlier.

The graphs of median responses are displayed in **Figure 3** for the amount of time reported reading for fun, **Figure 4** for the amount of time spent reading for school and **Figure 5** for the amount of time spent doing homework. In these graphs, the median responses are based on all responses collected each week (from Week 2 to 10), and it can be seen that for each questionnaire topic, there was little change across time for either group.

Research Question 3: Trends Regarding Parent/Guardian Involvement in Children's Literacy Development and Communication with Schools

Response rates for each Demographic Questionnaire item relating to parent and/or guardian involvement with their child's literacy development and communication with schools are available in **Tables 14, 15, 16, 17, and 18**. Many parents and/or guardians who responded to these questions provided more than one answer for each question, so the numbers of parents and/or guardians that mentioned each topic often add up to more than the number of respondents for each question. Particularly at posttest, response rates were quite low; therefore, comparing responses across time and groups was difficult, so only broad trends will be discussed. For example, it was clear that the methods used to help children with homework (**Table 14**) were quite similar across groups and time

periods, and often parents and/or guardians reported that they helped by sitting and being present with children during homework or working through it with them. Some parents and/or guardians noted they sought out additional games, activities, or resources as well. At posttest, one of the BRSS parents and/or guardians also noted that they focused on teaching their children specific school topics and one mentioned that they had a tutor for their child. There were no details regarding the type or quality of tutor that the child had. This tutor may have been an older child, a tutor who volunteered their time, or a paid tutor, although within the low SES area, having a paid tutor may have been unlikely.

Because of the low response rates, particularly for the posttest Demographic Questionnaires, and because of the small proportion of families who spoke another language besides English, there were very few respondents for the question asking what the parents and/or guardians did to help their children with homework from language schools, so results are very briefly reported. No parents and/or guardians of the BRSS group explained how they helped their children with language school homework at pretest, and only 1 parent/guardian in this group reported how they helped with language school homework at posttest. For the control group, 2 parents and/or guardians reported this information at pretest and only 1 parent and/or guardian reported this information at posttest. Therefore, these data are not dealt with further. The topics that were mentioned regarding how parents and/or guardians helped their children with language school homework were similar to some of the topics mentioned by parents and/or guardians regarding how they helped their children with homework from the public school. Topics included working through it together, reading with them (in the language they attended language school for), or having someone else in the household help the child with their

language school homework.

Parents and/or guardians of the BRSS group and the control group were also asked what other things they did in order to help their child do better at school (**Table 15**). Responses were fairly similar across groups and time periods. The most commonly mentioned methods mentioned by both groups at both time periods were providing additional activities, games, or resources, and encouraging the child to read at home. At least one parent and/or guardian in each group and at both time periods mentioned that they talked to their child about the value of education or encouraged discussions about and focus on school as an important part of their day.

Table 16 displays the methods mentioned by parents and/ or guardians of the BRSS group and the control group regarding other things they would like to do in order to help their child more at school and what would help them to be better able to help their child with school. Many of the topics related to being more informed from the school or school board. Specifically, responses included having better communication with the school, understanding the curriculum better or where the child needs to improve, or having more resources or suggestions about what they can do at home. At pretest, the control group also mentioned that having a tutor for their child would be helpful. Across both time periods, both groups mentioned that having more time would be important for allowing them to be better able to help their children with school.

Although the mid- and final-program evaluations are property of Project READ (2012-2013b), and specific results will not be discussed here, general trends can be discussed. Based on the results of the evaluations, it was clear that across all three times that the program was run with Project READ, the parents and/or guardians reported

generally positive feedback on both the mid- and final-program evaluations (Project READ, 2012-2013b). On these evaluations, parents and/or guardians generally reported that attending the programs was beneficial for learning ways to help promote literacy development at home. Specific averages for responses to these questions will not be reported in order to respect Project READ's ownership of the evaluations.

The influence of the programs on parents' and/or guardians' comfort and confidence in communicating with the schools was also considered**. Table 17** summarizes the methods mentioned by parents and/or guardians regarding how they found out about how and what their child was doing at school. Again, responses rates, particularly at posttest, were quite low so comparisons across groups and time periods are not possible. However, at every time period and for both groups, parents and/or guardians mentioned general contact with school staff, items brought back and forth in the child's backpack (such as planners and/or newsletters), and asking their child about school as methods they used to find out about how and what their child was doing at school. Few parents and/or guardians mentioned the school website or email as methods they used to find out how or what their child was doing at school. **Table 18** shows that the most popular method of communication with the school across both the BRSS and control groups was to use notes, and the next most popular method was to use scheduled meetings. These were the most popular methods at both pretest and posttest. The third most popular method of communication was by telephone. However, due to low response rates, particularly at posttest, comparisons cannot be made across groups or time.

The research team also asked Project READ to add a question into their mid- and

final-program evaluations (Project READ, 2012-2013b) regarding whether the parents and/or guardians felt more confident with speaking with their children's school or teachers since attending the intervention program. Across all PR/BRSS programs, the lowest percentage of parents and/or guardians who responded to this question that agreed that they had become more confident to some extent was approximately 88.8%.

Discussion

The purpose of this study was to design, implement, and evaluate the BRSS program for students in Grades 3 to 6 when offered along with a family literacy intervention provided by Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011). The need to increase the number of participants in the study led to the opportunity for the research team to offer the BRSS to children on its own, along with weekly tips for promoting literacy at home and a literacy development workshop for the parents/and or guardians. The difficulty in recruiting participants led to small sample sizes and therefore the data may not be representative of all children in Grades 3 to 6 in the schools at which recruitment occurred. Because of this issue, the results must be interpreted with caution. The unique characteristics of the BRSS intervention, such as the science-based enrichment-type and hands-on activities offered to the families of low SES, made the program one that was likely a new type of experience for the children from families of low SES. The short-term approach and the activities included for the families of low SES also made the study unique in its contribution to the field of literacy interventions. Results suggested that participation in both forms of literacy interventions, with the Project READ family intervention (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and the BRSS together, and with the BRSS on its own along with

weekly literacy development tips and a family workshop, may be beneficial for the improvement of certain literacy skills. These results also suggested that even fairly short-term interventions, such as the 10-week, once per week interventions described in this study, may have important effects on the literacy skills of children in low SES areas.

Influence of the Literacy Interventions on Reading Comprehension, Vocabulary, Reading Fluency, Reading Accuracy, Phonological Processing, and Verbal Fluency

The main focus of the study was to evaluate whether participants in the interventions improved on measures of reading comprehension, vocabulary, reading fluency, reading accuracy, phonological processing, and verbal fluency relative to the control group. Although there were no statistically significant differences between the groups on measures of vocabulary, reading fluency, phonological processing, or verbal fluency, there were differences in regards to improvements in reading comprehension scores and reading accuracy scores. First, the intervention groups involving the full family literacy programs by Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) and the BRSS program together, as well as the BRSS program on its own with the weekly literacy tips and literacy workshop were considered as an overall intervention group. In this case, there was a significantly greater improvement for the intervention group than for the control group on reading comprehension skills. Interestingly, the overall intervention group's mean difference scores indicated that overall, the group's scores had tended to increase over time because there was a positive mean difference score, and difference scores were calculated by subtracting pretest scores from posttest scores. In contrast, for the control group, the mean difference score for the comprehension scores was negative, indicating that the overall scores on the control

group's comprehension scores tended to decrease over time. It should be noted that the effect size indicated that approximately 8.8% of variance in the scores was due to the effect of the groups (overall intervention versus control group).

It may be that participation in the intervention programs helped to minimize "the 4th Grade 'Slump'" for the intervention group (Chall, 1983, 1996, p. 67), whereas the control group did not have this opportunity. According to Chall (1983, 1996), this phenomenon begins to affect children from low SES children more than children from families of higher SES even during the pre-reading stage, and that the difficulty with literacy skills continues to worsen throughout the elementary grades. In Grades 2 and 3, the differences between children in families of low SES versus families of higher SES tend to become even greater. If these children are not provided intervention by Grade 4, the children's literacy skills often show obvious signs of being in this 'Slump' (Chall, 1983, 1996, p. 67), which means that they are noticeably behind in literacy skills compared to the children from families of higher SES. Chall (1983, 1996) noted that at this period of children's education, a focus on reading comprehension skills is crucial in order to avoid falling further behind. All children in the study were from schools or areas of low SES and it may have been that the children in the control group were continuing to decline in terms of literacy skills because they did not receive the literacy interventions to help prevent this from happening.

The results may also be explained by what Stanovich (1986) referred to as "Matthew effects" (p. 381), which is a term used to label "findings that that individuals who have advantageous early educational experiences are able to utilize new educational experiences more efficiently" (Walberg & Tsai, 1983, as cited in Stanovich, 1986, p.

381). Stanovich (1986) explained that this gap occurs because children who struggle with reading early on tend to have less motivation to read and therefore read less often, whereas children who do well with reading early on are more likely to enjoy reading and to read more often. Therefore, the children who do well with reading early on to continue to improve their reading skills whereas those children who struggle early on tend to practice less and therefore fall farther behind over time (Stanovich, 1986). Although Matthew effects may not occur in all cases of developing reading skills (Pfost, Hattie, Dörfler, & Artelt, 2014), it is possible that the interventions evaluated in this study allowed the children in this study to avoid falling farther behind, at least in some of the literacy skills.

It was hoped that the two intervention groups would be fairly similar groups at the beginning of the interventions because they were selected based on at-risk status. However, there were many significant differences between the scores at pretest and posttest for the PR/BRSS and BRSS groups. Changes in scores on the measures from pretest to posttest were also different for the two types of interventions. Typically, the children in the intervention which involved Project READ's programs (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) along with the BRSS tended to perform better on the literacy measures at pretest than the children that took part in the BRSS program while their parents and/or guardians received weekly literacy development tips and a literacy workshop (see **Table 6**). Therefore, the intervention group was subdivided and the subgroups were also compared to the control group. Based on comparing the three groups (two intervention groups and the control group) separately, there were significant differences among the difference scores for the Woodcock Reading Mastery Test-

Revised (WRMT-R) -Word Attack subtest (Woodcock, 1987). The WRMT-R Word Attack subtest was used as a measure of how accurately the participants could decode words that were not real English words (Woodcock, 1987). The children in the BRSS program improved significantly more than the PR/BRSS program and significantly more than the control group. However, these differences may also have been because, overall, the PR/BRSS group and the control group started off with higher scores on this measure at pretest than the BRSS program. Therefore, the PR/BRSS participants and the control participants did not need as much improvement on these score as the BRSS participants. The more intensive involvement of the families in the PR/BRSS programs may also help to explain why the PR/BRSS and BRSS groups, when considered together as an overall intervention group, were able to improve significantly more than the control group in regards to reading comprehension skills. It may have been that the families focused on helping their children learn how to comprehend what they were reading when they were working together at home by using strategies they learned at the program.

This type of hands-on, enrichment type of program may have also been beneficial by helping the children to expand their background knowledge in relation to various topics that were the focus of the science-based activities. Compton et al., (2014) suggested "…that the probability of promoting deep comprehension in children… is maximized through instruction that emphasizes the building and activation of relevant background knowledge as it applies to the text" (p. 64). This focus on background knowledge was key to the interventions evaluated by Wigfield et al. (2004) as well. Considering some of anecdotal reports from the parents and/or guardians that their children had never previously experienced programs of this type, and anecdotal reports

from the children that many of them had never learned about the science-based topics before, the BRSS program may have been useful for helping the children to expand their background knowledge in unique ways. It is this opportunity to expand background knowledge that Compton et al. (2014) have suggested is an important characteristic of literacy interventions that have a focus on improving reading comprehension.

Simple View of Reading in relation to results. These results can be explained in regards to the 'Simple View of Reading' (Gough & Tunmer, 1986; Hoover & Gough, 1990). According to this model, the ability to read requires both listening comprehension skills and decoding skills; without either one of these skills, the ability to read is lost (Gough & Tunmer, 1986; Hoover & Gough, 1990). This may explain why, when the intervention groups were compared to the control group individually, the BRSS group's decoding skills improved the most, but it may be that the intervention was not intensive or long-term enough in order to also help the BRSS group improve their comprehension skills. That is, the BRSS group may have been mainly improving their decoding skills during the program. In contrast, only when the two intervention groups were included as one overall intervention group were there improvements on the comprehension measure compared to the control group. This may have been because the PR/BRSS group had slightly larger improvements than the BRSS group on this measure because their decoding skills were already at a higher level than the BRSS group. A longer-term longitudinal study would be needed to evaluate whether the BRSS group would continue to improve their comprehension skills after their improvements on decoding skills.

As a similar explanation of the results, Catts, Hogan, and Adlof (2005) note, "Reading instruction in the primary grades focuses on teaching children to decode words.

Thus, individual differences in word recognition should be the primary contributor to reading comprehension in these grades" (p. 26). However, Catts et al. (2005) also state, "By fourth grade… the vocabulary, grammar, and discourse demands of reading materials become much greater. As a result, individual differences in children's language comprehension abilities (as measured by listening comprehension) should account for more unique variance in reading comprehension" (p. 26). To demonstrate this, Catts et al. (2005) reported the results of a longitudinal study involving 604 children who were to be tested on various measures in Grade 2, 4, and 8. Regression analyses were carried out with the data from the 527 participants who completed testing at every time period to how well children's decoding and listening comprehension skills would explain their level of reading comprehension skills when considering each grade separately (Catts et al., 2005). Catts et al. (2005) reported that 76.6% of the variability in reading comprehension scores in Grade 2 was explained by decoding and listening comprehension skills, whereas 71.85% of the variability in reading comprehension scores in Grade 4 was explained by decoding and listening comprehension skills, and finally, 72.8% of the variability in reading comprehension scores in Grade 8 was explained by decoding and listening comprehension scores. In Grade 2, the amount of shared variance explained by listening comprehension and word recognition was 40%, whereas it was about 39% in Grade 4 and 36 % at Grade 8, all of which were fairly similar. The amount of unique variance explained by word recognition (which involves decoding) was 27% in Grade 2, 13% in Grade 4, and 2% in Grade 8. Percentages for unique variance explained by listening comprehension were 9% in Grade 2, 21% in Grade 4, and 36% in Grade 8 (Catts et al., 2005). However, the children in the current study were from areas of low

SES and therefore, they may have been a bit farther behind in decoding than expected based on the results with the participants considered by Catts et al. (2005). It could be that children in the BRSS intervention, who tended to have the lowest scores on the literacy skill measures at pretest, started off so low in decoding abilities (see **Table 6**) that the decoding aspect important in the early elementary grades was the only part that the intervention was able to support, hence the increase in decoding accuracy scores. For the overall intervention group, it may have been that the PR/BRSS group helped lead to the significant improvement in comprehension scores over the control group because they already had stronger decoding skills than the BRSS group. Based on the means and standard deviations of the scores at pretest, it appears that a higher proportion of the participants in the BRSS group were legitimately at risk for learning difficulties due to low scores even though some these participants may have been performing at slightly higher levels. In contrast, the PR/BRSS and control participants tended to have higher average scores, and therefore they may have been less at-risk for falling behind in school despite their low SES background.

SES as a covariate. The addition of the adjusted overall SES scores based on the Hollingshead Four-Factor Index of Socioeconomic Status (Hollingshead, 1975) scales for education and occupation in the statistical tests led to results similar to those reported without SES as a covariant. This may have been because the SES did not make that much of a difference in terms of the ability to improve over the time between pretest and posttest due to it being a fairly short time period. Alternatively, it may be that the missing data on these variables, and the need to fill in missing data with the average scores (as described in the Results section) led to too many overall SES scores being the

same for multiple participants and therefore it could not account for much variance in the difference scores. In addition, it may also have been that the participants' schooling and/or involvement in the intervention programs helped to work as an equalizer, despite the children's SES or other background variables, for their performance on the measures (Downey, von Hippel, & Broh, 2004).

It is important to remember that children in the BRSS started off with lower performance on the literacy measures. Because the PR/BRSS programs focused more strongly on entire families attending, it may have been that families who were struggling were more likely to register, even if their child in Grades 3 to 6 may not have been particularly struggling. In contrast, the BRSS on its own focused more on the child than on the entire family, so children who were struggling may have been more likely to be registered by their parents and/or guardians, regardless of how strong the families' literacy skills were. This would potentially explain the differences on literacy measure scores at pretest despite all families being from areas of low SES. It should also be noted that although the participants in this study were from low income areas and were therefore considered at risk of school failure, it may have been that the participants as a group were at higher risk, but every individual was not necessarily at higher risk (Luthar, Cicchetti, & Becker, 2000). That is, low SES may not lead to children falling behind in literacy and academic skills despite the increased risk of this happening, and this may be due to what is referred to as resilience (Luthar et al., 2000). Luthar et al. (2000) state, "Resilience refers to a *dynamic process encompassing positive adaptation within the context of significant adversity*" (p. 543). Therefore, even if children are in low SES areas, some families who registered may have had overall low literacy levels in the

family, but the children may have been performing fairly well showing resilience due to "*protective factors* that might *modify* the negative effects of adverse life circumstances" in order to make the negative effects less intense (Luthar & Cicchetti, 2000, p. 858). An example of such a protective factor may be positive support from staff, parents and/or guardians, or other role models (Luthar & Cicchetti, 2000). In contrast, there may have been more "*vulnerability…factors*" (Luthar & Cicchetti, 2000, p. 858) for the children encouraged to participate in the BRSS program because the teachers and or principal may have encouraged the children with most difficulties to participate instead of thinking about their family situation. Examples of "*vulnerability…factors*" include learning difficulties or disabilities, which some children in the study may have had (Luthar & Cicchetti, 2000, p. 858). Some parents and/or guardians mentioned that their children were in the process of being diagnosed with learning disabilities or mentioned to the facilitators that their child had already been diagnosed. However, the facilitators were not provided with this information for all children who took part in the study and this information was shared only anecdotally. It seemed particularly common to hear from parents and/or guardians of the BRSS group that their children were being tested for, or had already been diagnosed with, with learning disorders or disabilities. It should be noted that the results may have been affected by some children having learning disorders or disabilities and therefore if there were more participants, including this as a variable may have been possible as well.

Relationships between scores on measures, and between scores on measures and age. Most of the scores on the measures had significant, direct relationships with one another at pretest, as expected. The lack of significant relationships between the Oral

Naming Fluency Task in the first language (adapted from Gollan et al., 2002) and the scores on the other measures may have been due to lower power caused, in part, by the smaller sample size included in these correlations. For this task, there were only 11 participants who were comfortable enough in their first language to complete it. The significant negative correlations at pretest included those between the other measures and the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Wagner et al., 1999). Of course, these negative correlations were expected because the raw scores on the measures of phonological processing speed were the numbers of seconds to complete the task, with longer times indicating a worse performance and vice versa. On all other tasks, higher scores indicated better performance. Correlations were similar between posttest measures.

Fewer correlations between the difference scores for the measures were significant. This may have been because the interventions were better for improving scores on certain measures but not all, so relationships between difference scores may have been weak. Additionally, some correlations may have been found to be significant due to Type I error because many correlations were considered, but they will be briefly discussed here. The large significant positive correlation between scores on the Gates-MacGinitie Reading Test- Comprehension subtest and the Vocabulary subtest (Cohen, 1988; MacGinitie & MacGinitie, 1992) could be expected because previous research has suggested a positive relationship between reading comprehension levels and vocabulary levels (Mezynski, 1983; Qian, 2002). The moderate significant positive correlation between the Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack subtest (Cohen; 1988; Woodcock, 1987) and the Test of Word Reading Efficiency (TOWRE)-

Phonemic Decoding Efficiency subtest (Cohen, 1988; Torgesen et al., 1999) was also expected as these measures target similar skills in that they both involve decoding words that are not real English words, but the TOWRE – Phonemic Decoding Efficiency subtest (Torgesen et al., 1999) also involves speed. The significant moderate negative relationship between the Test of Word Reading Efficiency (TOWRE)- Sight Word Efficiency subtest (Cohen, 1988; Torgesen et al., 1999) and the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming subtest (Cohen, 1988; Wagner et al., 1999) was expected because higher scores on the CTOPP Rapid Letter Naming subtest indicate worse performance whereas higher scores on the TOWRE Sight Word Efficiency subtest indicated better performance. The large significant positive correlation between the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Cohen, 1988; Wagner et al., 1999) (was also expected because both of those tasks involved phonological processing speed, so the difference scores for these should be similar. Finally, the very large significant positive correlations between the Oral Naming Fluency Task in the first language (Cohen, 1988; adapted from Gollan et al., 2002) and the Comprehensive Test of Phonological Processing (CTOPP)- Rapid Letter Naming and Rapid Digit Naming subtests (Cohen, 1988; Wagner et al., 1999) made sense because they both involved efficiency in oral language.

Age was only found to be significantly negatively correlated with the Woodcock Reading Mastery Test-Revised (WRMT-R) -Word Attack subtest (Woodcock, 1987) and the Oral Naming Fluency Task in the first language (adapted from Gollan et al., 2002). Most of the difference scores may not have been correlated with age because the group

varied so much in terms of abilities and their potential to improve. The significant negative correlations may have existed because the younger children may have been at lower levels and had more room to improve than older children.

Influence of Literacy Interventions on Self-Efficacy and Attitudes Toward Reading

Based on anecdotal reports from the facilitators and researchers involved in the first PR/BRSS program that the children in the program seemed to have increased self-efficacy for literacy activities, it was decided that the Reading and Writing Self-Efficacy Questionnaire (adapted from Shell et al., 1995, p. 388) should be added to the testing battery for the participants in the subsequent programs. Results indicated that there were no significant improvements for any of the groups from pretest to posttest. However, because these measures were only completed for 6 out of 11 PR/BRSS participants, 13 out of 13 BRSS participants, and 9 out of 20 control participants, there was clearly less statistical power than there could have been if all participants had completed this measure. Therefore, the low power may have limited the ability to detect any potential differences. Because children's performance on school-related assessments tends to be better when they have higher self-efficacy (Dearing et al., 2004), it was hoped that involvement with the program and constant positive encouragement would help improve self-efficacy measures. Hart and Risley (1995) noted that parents in families of lower SES tend to provide positive encouragement less often than parents in families of higher SES. Therefore, it may be that a stronger focus of the interventions should be on working with the parents and/or guardians to encourage them to use more positive encouragement and fewer prohibitions.

Changes in self-efficacy levels during reading interventions have rarely been a

focus of research (Wigfield et al., 2004). However, in Wigfield et al.'s (2004) more intensive intervention, which was offered each weekday for an hour and a half to two hours each day for a period of 12 weeks, the "Concept-Oriented Reading Instruction," (Wigfield et al., 2004, p. 304) intervention led to significantly greater gains in self-efficacy than the "Strategy Instruction" (Wigfield et al., 2004, p. 304) which was offered for one and half hours each day. The "Concept-Oriented Reading Instruction," (Wigfield et al., 2004, p. 304) program had similar features as the BRSS, which included science-based enrichment-type activities, along with the focus on using reading strategies which were the main focus in the "Strategy Instruction" (Wigfield et al., 2004, p. 304) program. This "Concept-Oriented Reading Instruction," evaluated by Wigfield et al. (2004, p. 304) was much more intensive than the BRSS and the PR/BRSS programs, which may have been why they resulted in an effect on self-efficacy. Alternatively, it may have been because, in the "Concept-Oriented Reading Instruction," (Wigfield et al., 2004, p. 304), children were also encouraged to make more choices about what they wanted to learn more about, rather than being led through enrichment-type activities like they were in the BRSS and PR/BRSS programs.

Interestingly, Wigfield et al. (2004) reported that there were significant gains in self-reported motivation for reading in both interventions. This is in contrast to the findings from the Children's Weekly Reading and Homework Questionnaires used in the current study because no significant gains were found for either intervention group. Other studies, including the evaluation of the READ 180® program completed by Kim et al. (2010) also indicated that literacy intervention can increase motivation to read as measured by self-reports of the amount of reading done. However, READ 180® program

was much more intensive than the PR/BRSS or the BRSS, as it was carried out for 23 weeks for 4 days per week (Kim et al., 2010), so it may be that in order to increase self-efficacy and motivation to read and attitudes toward reading, a more intensive intervention is necessary. Alternatively, it may be that significant self-efficacy gains may still be possible with the PR/BRSS programs, but future research would need to start with groups that were equivalent at pretest in terms of performance on measures and self-efficacy levels, and would also likely need to use larger samples, in order to evaluate this outcome further.

Trends Regarding Parent/Guardian Involvement in Children's Literacy Development and Communication with Schools

Generally, parent/guardian reports in the PR/BRSS program indicated positive responses at mid-program and final-program evaluations (Project READ, 2012-2013b), which were completed at the program. It was more difficult to interpret the results of the Demographic Questionnaire (adapted from Van Andel, 2011) for the BRSS, which were sent home with parents as both pretest and posttest measures because there were low response rates. Particularly low response rates in areas of low SES has been recognized in the literature (Biggart et al., 2013). For example, Biggart et al. (2013) stated that 32% of their sample of participants with low SES completed the questionnaires for pretest and posttest, which they argued "highlights the serious difficulties in securing high response rates from parents in an area of socio-economic disadvantage" (p. 134).

Due to low response rates, and the PR evaluations (Project READ, 2012-2013b) being completed at mid-program and end-of-program time periods it is difficult to discuss changes from beginning of the programs to the end. However, generally positive trends

were reported by the parents and/or guardians for both helping their children with their literacy and academic performance and their communication with the schools. It appeared most parents and/or guardians helped in some way with homework and academic skills, but it was also noted that some parents and/or guardians may have felt limited by time or a lack of understanding of the curriculum. It may be important for school boards to provide parents and/or guardians with frequent newsletters, parent-teacher nights, or online videos regarding specific curriculum topics being focused on in the classroom. This may also help to further improve the parents' and/or guardians' confidence levels in terms of communicating with schools because the parents and/or guardians have a better understanding of specific topics to ask about. It appears parents and/or guardians tended to use notes as a common form of communication anyway, so providing additional information regarding the key focus of lessons each week may be useful for parents and/or guardians when they are helping their children at home.

Limitations and Suggestions for Future Research

There were some limitations of this study that should be recognized. Many of these limitations lead to suggestions for future research that may improve upon the current study. One major limitation of the study was the issue of small sample sizes. By having 20 participants in the control group and 24 in the intervention group (11 in the PR/BRSS program and 13 in the BRSS program), even after offering the intervention programs four times, the low statistical power was an issue. Recruitment was difficult in the areas the programs were offered in. Transportation may have been an issue in the low income areas because if their children stayed after school then the families had to find transportation for the way home. Participants at one of the programs by Project READ

(Hewitt & Davis, 2011) were offered bus tickets through the food bank, which seemed to be useful for many families, so future research should involve budgeted money for these types of support. Future research may be carried out in the lab to continue to collect more data for both the intervention and control groups, although this was not possible before the completion of this thesis. The small sample sizes resulted in low power, and the samples may not have been representative of the children in Grades 3 to 6 at the schools at which the study took place.

Some limitations stemmed from compromises that may be necessary in order to have community organizations agree to allow the research to be carried out. For example, quite a few participants did not complete the Demographic Questionnaire (adapted from Van Andel, 2011) or the Activity Choice Questionnaire (adapted from Grant, 2007). For the PR/BRSS programs, Project READ staff had requested that we not ask the participating families to complete these questionnaires.[1] This was a compromise that was made in order to be able to continue the collaboration with Project READ. In addition, as noted earlier, very few questionnaires, particularly at posttest, were returned by the other participants. After the first program carried out with Project READ, Project READ staff allowed some questions from the demographic questionnaire (adapted from Van Andel, 2011) to be completed in their program evaluations which were completed by the parents and/or guardians, but the researchers were not provided information that would allow us to match specific responses/ questionnaire to specific participants. To help overcome this limitation, some verbal discussions allowed us to obtain some information about occupation, but still most information was missing. This meant that the SES covariate had to be estimated by using means for some participants, which may have

affected the results.

In addition, as with any collaboration between organizations and research groups, there was not complete control over the intervention. The change from going to the library in Week 7 to no longer offering the library trip after the first program carried out with Project READ (Hewitt & Davis, in press; Kelland & Wasielewski, 2011) meant that later programs involved moving later weeks up by one week each and then creating an additional activity for the final week in subsequent programs. Although this did not change the interventions greatly, it must be recognized as a limitation of the study and one that is out of the control of researchers in such collaborations.

Similarly, although pretest and posttests were originally planned to occur one week before the interventions began and within one to two weeks after the interventions ended, respectively, there was a lack of control over when researchers could enter the schools and meet with children. Although the principals and/ or teachers were generally very supportive of the research, scheduling was often difficult, which may have been worsened by some policy changes that were occurring in the school board. In addition, events such as school plays, field trips, school holidays, or even child illnesses led to delayed testing. Therefore, this should be noted as a limitation. Future research could involve offering testing at students' homes, although getting in contact with parents and/or guardians was often difficult and the researchers did not want to put additional burdens on parents and/or guardians. Over time, the number of trained testing volunteers increased during this study, which made scheduling easier, so starting off with a large group of testers is likely a beneficial method for future research.

In addition, in order to respect teachers and/or principals during a time when

many changes were being made to school board policies, teachers were not asked to rate participants regarding their weekly reading amounts, which may have been useful. Due to many families having low literacy rates at home, and to avoid the risk of requesting too many forms to be completed as part of participation, parents and/or guardians were not asked to report on their children's reading levels or amounts of reading on a weekly basis. However, the child self-reports may have had limited reliability (Lubans et al., 2011; Sallis et al., 1993). Therefore, parent and/or guardian and teacher reports of participants' time spent reading may be useful in future research as long as the request does not overburden school staff or families.

Furthermore, it may have been useful to have a control group that attended a program that involved general homework assistance and play activities as a typical after-school program might, as a control group in addition to the no-exposure control group. It is possible that the Hawthorne Effect (Festinger and Katz, 1953) may have played a role in any improvements greater in the intervention groups than the control groups, which may have been due to the children working closely with and being observed by the research team. However, funds and time for the project limited this possibility. It was also important for our team to be able to find schools willing to host the interventions, and the literacy intervention was likely more likely to be accepted than a general after school program.

In some cases, the level of engagement was also a difficulty that arose in the research as attendance rates were sometimes low. Many families had multiple stressors, activities, and commitments outside of the program and therefore some families missed multiple programs, leading to two children being removed from the study. In addition,

home stress led to one child being removed from the study due to a lack of engagement during the program and difficulty focusing on completing the posttest. When working in areas of low SES, these issues may be particularly prevalent. For example, the research team carrying out the intervention on which the BRSS was partly based (Pasquarella et al., 2013) noted anecdotally that home stress and absenteeism were also issues faced at the high school level with their literacy intervention (M. Azimi, X. Chen-Bumgardner, F. Farnia, C. Fraser, E. Geva, L. Iwenofu, T. E. Kornacki, & A. Pasquarella, group meeting communication, April-June, 2013).

In addition, self-selection bias was a limitation to the study. Participants could not be randomized to groups because of how recruitment had to be carried out and because it would not be ethical to turn away a family that wanted to take part in the whole program or to ask a family that wanted to take part in the control group to attend the program. Due to this bias, it may be that the samples were not representative of the families in the low SES areas from which participants were recruited. Another limitation in terms of the characteristics of the samples was that the school staff may have followed the instructions for selecting participants in different ways, which may also help to explain the noticeable differences between the groups in regards to pretest scores. Future research with larger numbers of participants could involve pretesting the participants and matching them across groups based on their pretest scores.

Another limitation of the study had to do with the measures available. That is, the Gates-MacGinitie Reading Test- Reading Comprehension and Vocabulary subtests (MacGinitie & MacGinitie, 1992) were meant for children in Grades 5 and 6. At first, the program was for children in Grades 4 to 6 so the tests were not too far outside of the

expected range; however, the research lab did not have access to the test for younger children, so it was used for all children in Grades 3 to 6 once the participant pool was expanded to include children in these grades. It should also be noted that the BRSS group included the highest percentage of students in Grade 3 (53.85%), whereas 18.18% of the PR/BRSS group was made up of students in Grade 3, and 10.00% of the control group was made up of students in Grade 3. Children in Grade 3 may have found the version of the Gates-MacGinitie Reading Test (MacGinitie & MacGinitie, 1992) used in this study to be particularly challenging. In the BRSS group, the average pretest score for Grade 3 students on the Comprehension subtest of the Gates-MacGinitie Reading Test (MacGinitie & MacGinitie, 1992) was 12.14 (*SD* = 1.86) and their average pretest score on the Vocabulary subtest of the Gates-MacGinitie Reading Test (MacGinitie & MacGinitie, 1992) was 9.43 (*SD* = 4.79). The average pretest scores on this measure for the BRSS participants in Grades 4 to 6 appeared slightly higher than for the BRSS participants in Grade 3. For the participants in Grades 4 to 6, the pretest score on the Comprehension subtest of the Gates-MacGinitie Reading Test (MacGinitie & MacGinitie, 1992) was 13.00 (*SD* = 8.20) and the average pretest score on the Vocabulary subtest of the Gates-MacGinitie Reading Test (MacGinitie & MacGinitie, 1992) was 11.67 (*SD* = 9.03). Therefore, the scores on this measure, particularly for many students in the BRSS group, may have been affected by the use of the measure for students in grades for which it was not designed. This should be noted as a limitation of the study and results should therefore be interpreted with caution. In the future, all testing booklets should be used for the appropriate age groups.

It should also be recognized that, due to using multiple statistical results in the

study, the chance of Type I error was increased. This should be recognized as a limitation of the study; however, it seemed the best way to consider the data was with individual tests, so the results should be interpreted with the idea that Type I errors may have occurred.

Many directions for future research can be suggested. Although the BRSS program exposed children to multiple strategies for improving their literacy skills, it may be important to evaluate a similar intervention that is more time-intensive and therefore allows for more practice and feedback for each strategy that was focused on. Future research may also provide parents and/or guardians with more detailed instructions of specific lessons to do with children at home as an intervention program. This could involve a parent and/or guardian workshop to introduce the study and the lessons in the book and then they could be sent home with a manual with daily enrichment science-based activities that could be used to promote literacy skills. For example, one lesson may be to watch the steam come out of a pot and then read about why that happens when water boils. Each of these enrichment-type hands-on activities could be created as low or no-cost activities and the effectiveness of this type of intervention could be evaluated. It is also important to note that the schools in which the interventions were offered provided access to fairly modern computers and programs for the children. Therefore, an intervention with hands-on enrichment activities involving technology such as computers, tablets or smartphones may be options in the future as children tend to have at least a basic level of experience already with technology at a fairly young age. In addition, the use of technology can be useful for motivating children to take active roles in their own learning (Gabrielle, 2003).

It is also recommended that in future research this type of enrichment-type science-based programming should be offered to various age groups beyond Grades 3 to 6, particularly to younger students. Younger children may be particularly interesting to study because the decoding skills may be a larger focus of their literacy learning at that age (Catts et al., 2005). As part of family-based literacy interventions, it may be useful for future research to also obtain pretest and posttest measures of literacy skills from all family members who take part in order to evaluate the effects of the intervention on all members of the families. Longitudinal studies may be important because improvements gained in these programs may lead to further improvements in literacy skills even after the intervention period due to strategies learned that can be used even after the intervention is over.

Practical Implications

It is rare for enrichment-type hands-on literacy interventions to be offered for children in low SES areas who are at-risk of school failure. Previous interventions that have offered enrichment-type activities to children in low-SES areas have required much more time and have mainly focused on whether these activities improve motivation for reading, rather than whether they promote the development of literacy skills themselves (e.g., Wigfield et al., 2004). The current study contributed to the literature on family literacy and literacy interventions for at-risk children by showing that these types of hands-on enrichment-type interventions that involve children's families can have positive significant effects on decoding skills and potentially on comprehension skills as well. Further research is needed regarding how these types of interventions may affect other literacy skills, although many practical implications can be discussed based on the

findings of the current study. However, the family focus was fairly unique in this intervention and it suggests that it may be useful to have more policies and funding geared toward helping entire families receive literacy interventions together rather than as separate programs, which is how the programs are often offered.

First of all, there was no effect of the interventions on the scores on literacy measures of vocabulary, reading fluency, phonological processing speed, and verbal fluency, which leads to suggestions for how future literacy interventions are approached. The lack of improvements may have been due to the low decoding skills, particularly in the BRSS group. Nation (2005) argued, "Arguably, the most important cause of reading comprehension failure in children stems from difficulties with decoding and word recognition: If a child cannot read words with a reasonable degree of accuracy, their comprehension will be severely compromised" (p. 44). Therefore, an intervention with a stronger focus on decoding skills may be most beneficial for children in Grades 3 to 6 who are struggling with literacy. Alternatively, this suggests that children's decoding skills should be tested prior to being registered for literacy interventions. It may be that funding for literacy interventions could be spent more wisely by assigning participants to specific interventions as needed. For example, following tests of decoding skills, children could be assigned to specific interventions, depending on how much focus is necessary on decoding. The main focus of the BRSS program was on reading comprehension and vocabulary, but it may be useful in the future to provide an intervention with a focus on decoding skills first if students are behind in these skills. The ease and importance of including families in the interventions also suggests that more literacy interventions in the future could be family-based as well. A more intensive,

long-term program may be important in the future in order to have effects on other literacy skills.

Self-efficacy and attitudes and motivation toward reading also did not change significantly more for the intervention groups than for the control groups. However, trends, as well as written and verbal feedback indicated that parents and/or guardians may have found the programs helpful in gaining confidence with helping their children with literacy development and communicating with their schools. Research regarding the Head Start program in the U.S.A. has also indicated that involvement in these types of programs can lead to improvements in how parents and/or guardians interact with their children to promote academic skill development (Starkey & Klein, 2000). These increases in confidence may be a starting point that could allow for further improvements in the future if the families continue to use the strategies they have learned and continue to gain a better understanding of the curriculum expectations by more effectively with their children's schools. It may be that these changes are important steps for the families to be able to effective support their children's literacy and academic development. This also suggests that schools could potentially teach parents and/or guardians specific strategies to use at home, which may not only help parents and/or guardians contribute to their children's literacy development more effectively, but also improve communication and understanding of the curriculum for the parents and/or guardians.

Another practical implication from this program was the need to recognize barriers to accessing literacy intervention programs and to consider strategies to help improve attendance with families of low SES. For example, transportation was an issue in some areas, so bus tickets were supplied by the food bank or Project READ to help

with this barrier. The meals and snacks as part of the PR/BRSS programs and the BRSS programs seemed to be greatly appreciated by the families and were important for many of the families who may not have had enough to eat that day. Anecdotal evidence from the families suggested that they rarely had other community programs that were free of cost and that the no-cost programs for themselves and their children were appreciated. Many of the families would likely benefit from suggestions for enrichment-type activities to do at home with their children to promote reading and literacy skill development that are low-cost, so more specific manuals may be useful. These manuals could be made available through early childhood learning centres or school boards.

Conclusions

The current study indicated that enrichment-type hands-on activity-based literacy programs with support for parents and/or guardians may support decoding skills in at-risk children in Grades 3 to 6. The study also indicated that this type of program in addition to programs that are heavily family-based may help with comprehension skills if children already have an adequate level of decoding skills, but may not help with many other literacy skills, self-efficacy development, or attitudes and motivation toward reading. However, this was only one study with a fairly small sample size, so firm conclusions cannot be reached until further evaluation of such interventions is carried out with groups starting at the same general levels of literacy skills at pretest. Given the many strong correlations with various literacy skills shown at pretest and posttest, it may be that improvements in one area will eventually be useful for improvements in other skill areas in the future. It can also be concluded that free family-focused interventions are desirable in areas of low SES. Making these programs useful and enjoyable to families in low SES

areas by providing a welcoming atmosphere, offering transportation, and offering snacks or meals are all aspects that seem to make such programs attractive to the families and the schools in which they may be offered. The most important next step for evaluation these interventions would be to increase sample sizes and also to evaluate the long-term effects of these hands-on enrichment focused family interventions.

Appendix A

Sample Invitation Letter for Parents and/or Guardians in Intervention Groups

Better Reading for School Success Study

Your child is invited to be part of a research study called *Better Reading for School Success.* They are being invited to participate with this letter because they are in grades 3 to 6 and are attending the Better Reading for School Success program. The study will see how effective the activities of the program for children in grades 3 to 6 are at improving reading. The program has been developed at Wilfrid Laurier University by Alexandra Gottardo and Melissa Dol. If you let us know that you would like your child to participate in the testing portion of the study, we will meet with your child to complete some activities during school time. Your child will only do the activities if they also agree that they would like to do them. These activities will include reading short stories and paragraphs, saying words that fall into different categories, answering multiple-choice questions, matching words that label pictures, and completing a reading confidence questionnaire. The activities will be completed during schools hours or at nutrition breaks at your child's school. The time will be agreed upon with teachers and principal of your child's school.

Our research team will obtain a summary of the mid-program and end-of-program evaluation results from Project READ and these will contain no identifying information. No personal information will be shared and your child's performance will not be shared with your child's school or with anyone except our research team. If you would like to know more, please turn the page to the consent form.

If you would like your child to participate, please complete the section below along with 1 copy of a consent form (initial each page and then sign and provide the information on the last page). Remember you do not have to provide any information you do not want to. Please keep a copy of this

letter and a copy of the larger consent form.

Child's Name: _____

Child's age: _____ Child's grade: _____

Name of child's teacher: _____

Parent's/guardian's signature: _____

Date: _____

Appendix B

Sample Consent Form for Parents and/or Guardians-Intervention Groups

Better Reading for School Success

Principal Investigator: Melissa Dol Advisor: Dr. Alexandra Gottardo

Your child is invited to participate in a research study called *Better Reading for School Success.* The purpose of this study is to evaluate a literacy intervention program for students who are in the late elementary grades. The program has been developed by Dr. Alexandra Gottardo, a Psychology professor at Wilfrid Laurier University and Melissa Dol, a Masters student at Wilfrid Laurier University and will be implemented along with trained volunteers from the university and Project READ staff. In particular, this program will focus on helping the students to improve their reading comprehension and vocabulary. Your child is being invited to participate in this research study because they have signed up to participate in the Get Set Learn Afterschool program and they are in grades 3 and up. Specifically, participation in our study will involve your child's participation in group sessions for grades 3 and up during the Get Set Learn Afterschool program, completion of two sets of activities, and completion of short weekly questions about how much homework and reading they do. Some of the questions asked by Project READ staff about talking to your child's teacher and what you thought about the program will be shared with Melissa.

INFORMATION

The Get Set Learn Afterschool program will run for a total of 10 weeks. The first week will involve an orientation session and literacy activities with all families who have signed up for the program, and the next nine weeks will involve the actual literacy intervention. Throughout these nine weeks, each of the two-hour sessions will have a focus on a different activity that is designed to improve your child's reading comprehension and vocabulary.

In collaboration with Project READ, our research team will provide a research-based intervention program for the late elementary group attending the Get Set Learn Afterschool program. Our intervention will include various strategies to help the students and their families improve their reading comprehension and vocabulary development. The approach to teaching the students these strategies will be to use fun and interesting activities. For example, we will learn about topics that the students are interested in and will bring in materials (e.g., age-appropriate books, magazine, and games) for activities that are related to those topics. During these activities, we will focus on helping the students develop skills such as monitoring their level of comprehension and knowing when it is useful to focus on re-reading, summarizing, paying attention to the genre of the material that is being read, relating what they have read to something they already know about, and asking themselves questions about the material they have read (including who, what, where, when, and why questions). We will also focus on vocabulary development by helping students to think about the text surrounding the words they don't know, and by helping students to think about root words.

Your child that is in the program for grades 3 and up will attend the intervention program with their families for 2 hours per week for 10 weeks, for a total of 20 hours at the program during the normal Project READ Get Set Learn Afterschool hours. For our evaluation portion of the study, your child will be asked to complete a set of tests and a questionnaire about their level of confidence when reading during school hours in April and a set of tests again, and the

questionnaire after the last session of the program in June.

These tests will be completed with members of our research team (Melissa Dol, Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic) during school hours or nutrition breaks. These tests will include tasks such as reading short stories and paragraphs, saying words that fall into different categories, answering multiple choice questions, and matching words that label pictures. The first set of tests and the questionnaire will take approximately 2 hours and the second set of tests and the questionnaire will take approximately 1 hour and 30 minutes.

Therefore, participation in the research study will involve an additional 3 hours and 30 minutes of your child's time, for a total of approximately 24 hours in both the Get Set Learn Afterschool intervention program and the study. When your child attends the program each week they will also be asked to report on a paper the amount of time they spent doing homework that week and reading that week. If you do not consent to your child completing the tests for our study, you and your family are still welcome to participate fully in the intervention program as part of the Get Set Learn Afterschool program. All tests will be completed during school hours or during nutrition breaks in a room at your child's school at a time that is agreed upon with teachers and principals.

In addition, when Project READ asks you questions about how you communicate with your child's teacher and what you thought about the program, that information may be shared with our research team. Your answers will not be matched to you in any way. A similar program may be run in one or two other schools, and we hope that approximately 30 children in grades 3 and up whose families are attending the program will be invited to participate in both the after-school program and the research study in total. We hope that approximately 30 children in grades 3 and up whose families are not attending the Get Set Learn Afterschool program will be invited to participate as part of a control group across all of the schools at which the program is offered. The actual number of participants in the program group and the control group will depend on the number of families who agree to participate in our study.

RISKS

When your child (in grades 3 and up) is completing the testing, it is possible that they may have difficulty which may cause some stress. These feelings are normal and should be temporary. The tests are designed to be challenging. However, the children will not be informed explicitly how well they are doing. Children will be encouraged and praised constantly regardless of performance. Praise will also be given for effort. Social risks involved in this research are the same as risks that accompany being part of the intervention and not being part of the study. Specifically, the risk includes the perception that your family or one of your children requires assistance with literacy. However, Project READ staff and WLU volunteers are trained to implement to program as a fun, extracurricular activity. Fatigue may be a potential risk because the Get Set Learn Afterschool program and our intervention part are held for 2 hours after the children have been in school during the day. However, Project READ has run sessions like this many times before without any problems. Although the intervention targets literacy skills, it is designed to be a fun program.

BENEFITS

Participants of this research program will benefit from the research-based literacy intervention that is provided to children in grades 3 and up during the Get Set Learn Afterschool program at no cost. You and your family are still able to participate in all aspects of the Get Set Learn

Afterschool program even without completing the tests and questionnaire for our research study. However, completing the measures may help children reflect on their own learning as well. This research will be useful to help determine whether the designed program is an effective intervention that produces significant improvements in reading comprehension and vocabulary development. We hope that this research will help to bring awareness to the importance of literacy issues in the Waterloo region.

CONFIDENTIALITY

Confidentiality cannot be guaranteed in a group setting. The data that is collected from you and your child will be kept confidential through the use of code numbers on the tests and papers that are completed by your child, consent forms, and a master-list that will identify who the codes belong to. These code numbers will be assigned randomly based on schools. The tests, questionnaires, and papers that your child uses to tell us how much time they spend reading and doing homework will be stored separately from the consent forms and master-lists in locked drawers in the research lab of Dr. Alexandra Gottardo. Only Melissa Dol, Dr. Alexandra Gottardo, and the trained research assistants in Dr. Gottardo's lab (Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic) who are helping with the project have access to the data.

We ask for your child's date of birth so that we can accurately report age groups in the report of results. All registration forms will be kept by staff at Project READ. Members of our research team will enter the data we collect into password-protected computer and USB files that contain only codes as identifying information. The data we collect will be kept indefinitely, and the master-list with the participant names and numbers will be maintained in hard copy form and will be destroyed by Dr. Gottardo on August 29, 2014. We will not share your child's individual scores with you, with the schools, or with anyone else except the research team.

COMPENSATION

For participating in this study your child will receive a $15 gift card to Chapters after they complete the second set of tests. If they stop attending the Get Set Learn Afterschool program before it is complete and if they do not meet us to complete the second set of tests, then we will give the gift card to the principal of their school to give to your child after the other participants have completed the tests. If you or your child withdraws from the study prior to its completion, your child will still receive the gift card and will still be allowed to participate fully in our intervention program and the rest of the Get Set Learn Afterschool program.

CONTACT

If you have questions at any time about the study or the procedures, you may contact the researcher, Melissa Dol at dolx3180@mylaurier.ca or Melissa's advisor, Dr. Alexandra Gottardo at 519-884-1970 ext. 2169 or at agottard@wlu.ca or you can contact her by mail at Department of Psychology, 75 University Ave. W. Waterloo, ON, N2L 3C5. This project has been reviewed and approved by the Research Ethics Board at Wilfrid Laurier University (REB #3309) and by the Waterloo Region District School Board. If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or rbasso@wlu.ca.

PARTICIPATION

Your child will only participate in our study if you give your permission and if your child verbally agrees to participate in our study when we ask them. Your participation and your child's participation in this study is voluntary; you and your child may decline to participate without penalty. If you decide to allow your child to participate, you may withdraw your permission from the study at any time without penalty and without loss of benefits to which your child is otherwise entitled. If you or your child withdraws from the study, every attempt will be made to remove your data and your child's data from the study, and have it destroyed. You have the right to refuse to participate in any part of the study and to refuse permission for your child to participate in any part of the study. Your child has the right to refuse to participate in any part of the study as well.

FEEDBACK AND PUBLICATION

No individual scores will be discussed in the presentation of results. Rather, only group scores will be discussed. The results will be written about as a Masters thesis project, may be published in journal articles, presented at conferences and shared with schools and organizations such as Project READ. If you would like to receive a summary of the results, please provide your address below. A final copy of the written results will be available no later than August 29, 2014.

CONSENT

I have read and understand the above information. I have received a summary of this form. I agree to allow my child to participate in this study.

Child's Name: _____

Child's date of birth (DD/ MM/ YYYY): _____

Parent's/ guardian's signature: _____ Date _____

Investigator's signature: _____Date _____

If you would like a summary of the research results, please provide your address or email address below:

Address: _____

City, Province: _____

Postal code: _____

Email address: _____

Appendix C

Sample Invitation Letter for Parents and/or Guardians of the Control Group

Better Reading for School Success Study

Your child is invited to be part of a research study called *Better Reading for School Success.* They are being invited to participate with this letter because they are in grades 3 to 6 and are *not* attending the Better Reading for School Success program. The study will see how effective the activities of the program for children in grades 3 to 6 are at improving reading. The program has been developed at Wilfrid Laurier University by Alexandra Gottardo and Melissa Dol. If you let us know that you would like your child to participate in our control group for the study, we will meet with your child to complete some activities during school time. Your child will only do the activities if they also agree that they would like to do them. These activities will include reading short stories and paragraphs, saying words that fall into different categories, answering multiple-choice questions, matching words that label pictures, and completing a reading confidence questionnaire. The activities will be completed during schools hours or at nutrition breaks at your child's school. The time will be agreed upon with teachers and principal of your child's school.

If you would like to participate, we will also ask you, the child's parent or guardian, to complete one set of questionnaires in April (attached here) and one set of questionnaires in June, and return them to the school. No personal information will be shared and your child's performance will not be shared with your child's school or with anyone except our research team. If you would like to know more, please turn the page to the consent form.

If you would like your child to participate, please complete the section below along with 1 copy of a consent form (initial each page and then sign and provide the information on the last page) and the attached questionnaires. Please return these forms to your child's school. Remember you do not have to provide any information you do not want to. Please keep a copy of this letter and a copy of the larger consent form.

Child's Name: _____

Child's age: _____ Child's grade: _____

Name of child's teacher: _____

Parent's/guardian's signature: _____ Date: _____

Appendix D

Sample Consent Form for Parents and/or Guardians-Control Group

Wilfrid Laurier University
Better Reading for School Success
Principal Investigator: Melissa Dol Advisor: Dr. Alexandra Gottardo

Your child is invited to participate in a research study called *Better Reading for School Success*. The purpose of this study is to evaluate a literacy intervention program for students who are in the late elementary grades. The program has been developed by Dr. Alexandra Gottardo, a Psychology professor at Wilfrid Laurier University and Melissa Dol, a Masters student at Wilfrid Laurier University and will be implemented along with trained volunteers from the university and Project READ staff. In particular, this program will focus on helping the students to improve their reading comprehension and vocabulary. Your child is being invited to participate in this research study because they are in grades 3 and up at a school at which your child was invited to participate, but they are not attending the program. You may have contacted our research team after seeing a flyer advertising our study so that your child could participate in our study or this package of information may have been sent home from school with your child. Therefore, he/she is invited to participate in our study as a member of a control group in order for us to see how children in the intervention program do compared to those who are not in the intervention program. Some of the questions asked by Project READ staff about talking to your child's teacher and what you thought about the program will be shared with Melissa.

INFORMATION

If your child participates in the study, he or she will be asked to complete a set of tests and a questionnaire during April and will be given the same tests and questionnaire in June (approximately 9 to 10 weeks apart) with members of our research team (Melissa Dol, Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic). These tests will include standardized measures that are appropriate for his or her age range. These tests will include tasks such as reading short stories and paragraphs, saying words that fall into different categories, answering multiple choice questions, and matching words that label pictures. The questionnaire will ask your child about how confident they are with various reading activities. The first set of tests and the questionnaire will take approximately 2 hours and the second set of tests and the questionnaire will take approximately 1 hour and 30 minutes. Therefore, participation in the research study will involve 3 hours and 30 minutes of your child's time. All tests will be completed during schools hours or at nutrition breaks in a room at your child's school at a time that is agreed upon with teachers and principals of your child's school.

You will also be provided with a consent form and two background information questionnaires that will be sent home with your child and we will request for you to complete and return them to the school with your child in April. We will also send home a questionnaire in June that we will request that you complete and return with your child. These questionnaires should take approximately 20 minutes of your time in total.

You will be offered a one evening workshop in June at Alpine School, hosted by members of our research lab, which will focus on fun ways that your family can help your child work on their reading skills at home. Across all schools that participate, we hope to have approximately 30 children in grades 3 and up will attend the Get Set Learn Afterschool program and complete both

sets of tests.
Approximately 30 children in grades 3 and up whose families have not yet attended the Project READ after-school program will be invited to participate as part of a control group for our study. The actual number of participants in the groups will depend on the number of families who agree to participate in our study.

RISKS

When your child (in grades 3 and up) is completing the testing, it is possible that they may have difficulty which may
cause some stress. These feelings are normal and should be temporary. The tests are designed to be challenging. However, the children will not be informed explicitly how well they are doing. Children will be encouraged and praised constantly regardless of performance. Praise will also be given for effort.

BENEFITS

Completing the tests may help children reflect on their own learning. This research will be useful to help determine whether the designed program is an effective intervention that produces significant improvements in reading comprehension and vocabulary development. We hope that this research will help to bring awareness to the importance of literacy issues in the Waterloo region.

CONFIDENTIALITY

Confidentiality cannot be guaranteed in a group setting. The data that is collected from your child's tests and on the questionnaires will be kept confidential through the use of code numbers on each of these documents that will be stored separately from the consent forms and master-list that will identify who the codes belong to. These code numbers will be assigned randomly based on schools. These documents will be stored in locked drawers in the research lab of Dr. Alexandra Gottardo. Only Melissa Dol, Dr. Alexandra Gottardo, and the trained research assistants in Dr. Gottardo's lab (Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic) who are helping with the project have access to the data. The electronic data files that are created after entering the data into computer files will not contain any identifying information and will be password-protected. We ask for your child's date of birth so that we can accurately report age groups in the report of results. Members of our research team will enter the data we collect into password-protected computer and USB files that contain only codes as identifying information. The data we collect will be kept indefinitely, and the master-list with the participant names and code numbers will be maintained in hard copy form and will be destroyed by Dr. Gottardo on August 29, 2014. We will not share your child's individual scores with you, with the schools, or with anyone else except the research team.

COMPENSATION

For participating in this study your child will receive a $15 gift card to Chapters after they complete the second set of tests. If they not return for the second set of tests, then we will give the gift card to the principal of their school to give to your child after the other participants have completed the tests. If you or your child withdraws from the study prior to its completion, your child will still receive the gift card and you will still be offered a workshop, hosted by members of our research lab, on fun ways that you can help your child with literacy skills at home.

CONTACT

If you have questions at any time about the study or the procedures, you may contact the researcher, Melissa Dol at dolx3180@mylaurier.ca or Melissa's advisor, Dr. Alexandra Gottardo at 519-884-1970 ext. 2169 or at agottard@wlu.ca or you can contact her by mail at Department of Psychology, 75 University Ave. W. Waterloo, ON, N2L 3C5. This project has been reviewed and approved by the Research Ethics Board at Wilfrid Laurier University (REB #3309) and by the Waterloo Region District School Board.

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or rbasso@wlu.ca.

PARTICIPATION

Your child will only participate in our study if you give your permission and if your child verbally agrees to participate in our study when we ask them. Your child's participation in this study is voluntary; they may decline to participate without penalty. If you decide to allow your child to participate, you may withdraw your permission from the study at any time without penalty and without loss of benefits to which your child is otherwise entitled. If your child withdraws from the study, every attempt will be made to remove your child's data from the study, and have it destroyed. You have the right to refuse permission for your child to participate in any part of the study and your child has the right to refuse to participate in any part of the study as well.

FEEDBACK AND PUBLICATION

No individual scores will be discussed in the presentation of results. Rather, only group scores will be discussed. The results will be written about as a Masters thesis project, may be published in journal articles, presented at conferences and shared with schools and organizations such as Project READ. If you would like to receive a copy of the written results, please provide your address below. A final copy of the written results will be available no later than August 29, 2014.

CONSENT

I have read and understand the above information. I have received a summary of this form. I agree to allow my child to participate in this study.

Child's Name: _____

Child's date of birth (DD/ MM/ YYYY): _____

Parent's/guardian's signature _____Date _____

Investigator's signature_____ Date _____

If you would like a summary of the research results, please provide your address or email address below:

Address: _____City: _____

Postal code: _____ Email address: _____

Appendix E

Sample Script for Assent- Children in Intervention Group

Wilfrid Laurier University
Verbal Assent Statement

Better Reading for School Success

Principal Investigator: Melissa Dol Advisor: Dr. Alexandra Gottardo

You are invited to participate in a study called *Better Reading for School Success*. In this study, we want to find out how well our program works for helping students to improve their reading and vocabularies in grades 3 and up. Because you are taking part in the Get Set Learn Afterschool program that is offered by Project READ and students and staff at Wilfrid Laurier University, you are invited to participate in our study which will involve your participation in our group session for students in grades 3 to 6 during the Get Set Learn Afterschool program and completing two sets of activities to see how well the program works.

INFORMATION

If you decide to be part of the study, you will continue to be in the Get Set Learn Afterschool program and you will be attending our group in particular. At the Get Set Learn Afterschool program, we will work on reading and writing activities with you and you will be asked to complete a set of activities during school hours at the beginning of the program in April and again during school hours at the end of the program in June (about 9 to 10 weeks apart). These activities will be completed at your school during school hours or nutrition breaks with members of our research team (Melissa Dol, Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic). The first set of activities will take about 2 hours and the second set of activities will take about 1 hour and 30 minutes. These activities include tasks such as reading short stories and paragraphs, saying words that fall into different categories, answering multiple choice questions, matching words that label pictures, and completing a questionnaire about how confident you are with various reading activities.

This program may be run other schools as well, and in total, we hope to have about 30 children who are attending the Get Set Learn Afterschool program complete the tests. We hope that about 30 children who are not attending the Get Set Learn Afterschool program also complete the same tests.

RISKS

When you are completing the activities during school hours, you may worry about how you are doing on the activities just like you might with any activity you may have taken in school. These feelings are normal and should be temporary. The activities are designed to be challenging and you should just do your best on the tests. None of your scores on these activities will affect your school grades and we will not report your individual scores to the principals, teachers, or your family. Whether or not you participate in our study, other people at your school (such as other students and families) may notice that your family is attending the Get Set Learn Afterschool program and they may know that the focus of the program is on reading skills. However, it is also offered as a fun program for families to attend. You may also become tired during the intervention because the Get Set Learn Afterschool program and our intervention part are held for

2 hours after you have been in school during the day. However, Project READ has run sessions like this many times before without any problems and the program and intervention are designed to be fun.

BENEFITS

By doing this research, we hope to figure out if the program is able to help students get better at reading and improve their vocabularies. We hope that this research will help to bring awareness to the importance of reading and writing.

CONFIDENTIALITY

Confidentiality cannot be guaranteed in a group setting. We will make sure that nobody except the people on our research team can figure out who each set of test results and parent/guardian questionnaires belong to. We will do that by using a code number on your activities, pieces of paper where you will write down how much time you spent reading and doing homework each week, any information provided to us by Project READ, and consent forms that only the research team can match to your family. These code numbers will be assigned randomly based on schools. We will keep a list of who the codes belong to, but Dr. Gottardo will destroy the list on August 19, 2014. We will never destroy your data, but will make sure it is locked up safely when we are not using it. Members of our research team will enter the data we collect into password-protected computer and USB files that contain only codes as identifying information. We will not share your individual scores with your parent/ guardian, with the schools, or with anyone else except the research team.

COMPENSATION

For participating in this study, you will get a $15 gift card for Chapters after you complete the second set of tests. If you stop attending the Get Set Learn Afterschool program before it is complete and if you do not meet with us for the second set of tests, then we will give the gift card to the principal of your school to give you after the other participants have completed the tests. If you want to stop taking part in this study, you will still be given the gift card and you can still participate in the Get Set Learn Afterschool program.

CONTACT

If you have questions at any time about the study or what you are being asked to do, feel free to ask the researchers at any time. Any questions you have when the researchers are not here can be sent to the people whose address, phone numbers, and emails we gave to your parent or guardian. This project was approved by the Research Ethics Board at Wilfrid Laurier University (REB #3309) and by the Waterloo Region District School Board.

PARTICIPATION

Your parent/ guardian will be asked for permission for you to participate in the study and you will be asked verbally if you would like to participate as well. You will only participate in our study if you and your parent/guardian agrees that you will participate. You do not have to do any activities that you do not want to while you are participating in the study and if you no longer want to take part in the study, let the researchers know and we will do our best to get rid of your data. We will not be mad or upset if you decide you do not want to finish the study. If you or your parent/guardian decides to leave the study before it is finished, you will still be given the gift

card.

FEEDBACK AND PUBLICATION

We will not discuss your personal scores with anyone and we will share only how the groups did overall. We may talk or write about what we learn from this study in my school project, published articles, and at meetings and presentations where researchers share what they have learned. Our overall findings will be shared with schools and organizations such as Project READ. A copy of the written results will be available no later than August 29, 2014. If you would like a summary of the written results, please ask that your parents or guardians contact the researchers and ask for a copy.

CONSENT

Do you understand the information we gave you about this study? Do you agree to participate in this study, which involves completing two sets of tests?

Child's
Name:_____

To be completed by the investigator(s):
Did the child verbally agree to participate in the study after their parent/guardian gave their consent?:

□ Yes
□ No

Investigator's signature_____ Date _____

Appendix F

Sample Script for Assent- Children in Control Group

Wilfrid Laurier University
Verbal Assent Statement

Better Reading for School Success
Principal Investigator: Melissa Dol Advisor: Dr. Alexandra Gottardo

You are invited to participate in a study called *Better Reading for School Success*. In this study, we want to find out how well our program works for helping students to improve their reading and vocabularies in grades 3 and up. Because you are *not* taking part in the Get Set Learn Afterschool program that is offered by Project READ and students and staff at Wilfrid Laurier, you are invited to participate in our study which will involve completing two sets of tests.

INFORMATION

If you decide to participate, you will be asked to complete a set of tests in April and to complete a set of tests in June (about 9 to 10 weeks apart). These tests will be completed at your school during school hours or nutrition breaks with members of our research team (Melissa Dol, Amna Mirza, Phil Cave, Andrea Gallagher, Alyssa Stavrakos, and Jennifer Suckonic). The first set of tests and a questionnaire will take about 2 hours and the second set of tests will take about 1 hour and 30 minutes. These tests include tasks such as reading short stories and paragraphs, saying words that fall into different categories, answering multiple choice questions, and matching words that label pictures. The questionnaire will ask you about how confident you are with various reading activities.

Your parent/guardian will also be asked to complete a consent form and two background information questionnaires that will be sent home with you in April and they will also be asked to complete another questionnaire in June that will be sent home from school with you. You will be asked to return these completed questionnaires to school. The questionnaires should take approximately 20 minutes of your parent's/guardian's time.

Your family will also be offered a one evening workshop, which will be hosted by members of our research team in June, on fun ways that you and your family can work on reading skills at home.

About 30 children who are attending the Get Set Learn Afterschool program will be asked to complete these tests and about 30 children who are not attending the Get Set Learn Afterschool program will also be asked to complete the same tests. The actual number of students who participate will depend on the number of students that sign up for the study.

RISKS

When you are completing the testing, you may feel stress like you would during any test you may have taken in school. These feelings are normal and should be temporary. The tests are designed to be challenging and you should just do your best on the tests. None of your scores on these tests will affect your school grades and we will not report your individual scores to principals, teachers, or your family.

BENEFITS

By doing this research, we hope to figure out if the program is able to help students get better at reading and improve their vocabularies. We hope that this research will help to bring awareness to the importance of reading and writing.

CONFIDENTIALITY

Confidentiality cannot be guaranteed in a group setting. We will make sure that nobody except the people on our research team can figure out who each set of questionnaires and test results belong to. We will do that by using a code number that only the research team can match to your family for all of your tests, the parent/ guardian questionnaires and all other items that contain information about your family. These code numbers will be assigned randomly based on schools. We will not share your individual scores with your parent/ guardian, with the schools, or with anyone else except the research team. Members of our research team will enter the data we collect into password-protected computer and USB files that contain only codes as identifying information. We will never destroy your data, but will make sure it is locked up safely when we are not using it. The list that matches the codes to the participants in our study will be destroyed on August 29, 2014 by Dr. Alexandra Gottardo.

COMPENSATION

For participating in this study, you will get a $15 gift card for Chapters after you complete the second set of tests. If you do not return for the second set of tests, then we will give the gift card to the principal of your school to give you after the other participants have completed the tests. If you want to stop taking part in this study, you will still be given the gift card and your family will also still be offered a workshop, hosted by members of our research team, on fun ways to practice reading at home.

CONTACT

If you have questions at any time about the study or what you are being asked to do, feel free to ask the researchers at any time. Any questions you have when the researchers are not here can be sent to the people whose address, phone numbers, and emails we gave to your parent or guardian. This project was approved by the Research Ethics Board at Wilfrid Laurier University (REB #3309) and by the Waterloo Region District School Board.

PARTICIPATION

Your parent/ guardian will be asked for permission for you to participate in the study and you will be asked if you would like to participate as well. You will only participate in our study if you and your parent/guardian agree that you will participate. You and your parent/guardian do not have to do any activities that you do not want to while you are participating in the study and if you no longer want to take part, let the researchers know and we will get rid of your data. We will not be mad or upset if you or your parent/guardian decides they do not want to finish the study. If you or your parent/guardian decides to leave the study before it is finished, you will still be given the gift card.

FEEDBACK AND PUBLICATION

We will not discuss your personal scores or questionnaire information with anyone and we will share only how the groups did overall. We may talk or write about what we learn from this study in my school project, published articles, and at meetings and presentations where researchers share what they have learned. Our overall findings will be shared with schools and organizations such as Project READ. A copy of the written results will be available no later than August 29, 2014. If you would like a summary of the written results, please ask that your parents or guardians contact the researchers and ask for a copy.

CONSENT

Do you understand the information we gave you about this study? Do you agree to participate in this study, which involves completing two sets of tests?

Child's
Name:_____

To be completed by the investigator(s):
Did the child verbally agree to participate in the study after their parent/guardian gave their consent?:

□ Yes
□ No

Investigator's signature_____ Date _____

Appendix G

Sample Recruitment Form/ Flyer by Project READ (2012-2013a)

Get Set Learn

Afterschool

Fall 2011

A special time for families to learn and have fun together.

Come every Tuesday at 3:30pm for 10 weeks.

Come for Terrific Tuesdays

Children ages 6-12:	**Fun Activities, Games, Stories, Homework tips, Discussions**
Children birth-5:	**Stories, Songs, Finger Plays, Games, Fun**
Parents:	**Learn ways to help your child develop reading and math skills to improve learning**

Tuesday Sept 27 – Nov 29, 2011

Manchester Public School 3:30-5:30pm

Fax **to (519) 570-9510 or call (519) 893-7597**

Food and snacks provided

Parent/Caregivers Names (first and last):	Children's Names and ages:
Phone: Email:	
Food Allergies or Preferences (e.g. Halal): (please list all)	

Project READ Literacy Network

Cambridge Self-Help Food Bank

Ontario Early Years

Please remember that we have to make decisions based on the number of forms returned. Returning the form does not guarantee a spot.

Appendix H

Demographic Questionnaire (adapted from Van Andel, 2011)

Family Literacy Questionnaire

PART 1

Demographic information: Answer all parts that apply.

1. Were you born in Canada? YES NO

If no, how old were you when you arrived in Canada? _____

2. How many years were you in school?

a) English school _____

b) Other school (please specify): _____

3. Please place an X beside the highest level of education you have attained.

_____ Elementary school

_____ Some high school studies

_____ Completed high school

_____ Some college or university studies

_____ Completed college diploma

_____ Completed undergraduate degree

_____ Some postgraduate studies

_____ Completed graduate or professional degree

4. What is your occupation? : _____

If you are a new Canadian what was your occupation in your former country? _____

PART 2

Please answer these questions about you (as a parent) and your child.

How would you rate your skills in English and another language if you speak another language?

	Understand	Speak	Read	Write
English				
Other (specify):				

Which languages do you use in your daily life? Check all that apply.

	Home with spouse	Home with children	Work	With friends	With relatives	Shopping
English						
Other (specify):						

How old are your children?

Child by birth order	Age	Sex	Grade
1			
2			
3			
4			

What kinds of things do you do to help your children with homework that they bring from school?

_____

_____

What other things do you do at home to help your children do better at school?

_____

_____

How do you find out <u>how</u> and <u>what</u> your child is doing at school?

_____

_____

How do you communicate with the school?

	Yes	*No*
Notes		
Telephone		
Email		
Meetings (scheduled parent-teacher conferences)		
Meetings: informal (picking up child at school)		
Other		

Please expand on other category:

_____

What would you like to be able to do to help your child more at school? What would improve your ability to help your child with school?

_____

_____

If you speak another language at home, do your children go to a language school on weekend or in summer?

Yes _____ *No* _____

If yes, do you help them with their homework? How do you help them?

_____

_____

PART 3

Reading at home

How frequently does your family acquire the newspaper? (Please circle the correct response.)

Daily. Three times a week. Once a week. Rarely.

If you acquire a newspaper, what are the names of the papers you acquire most often?

_____

How often are magazines acquired in your family? (Please circle the correct response.)

More than one time a week. Once a week. Rarely.

If you acquire magazines, what are the names of the magazines you acquire most often?

_____

How often does the child go to the library?

Once a week. Twice a week. Once a month. Once a year. Never.

If your child goes to the library regularly, how many books does your child bring home each time? _____

Who reads these books to your child? _____

How many books do the adults in your house own?

None. From 1-5. From 5-10. From 10-25. 25 or more.

How often do you read to your child?

Daily. 5 times a week. 3 times a week. once a week.

How many books do the children in your house own?

None. From 1-5. From 6-10. From 10-25. 25 or more.

Please circle the answer that best indicates how true the following statements are about you and your child.

a) During his/her free time at home, your CHILD reads very often.

True. Somewhat true. Somewhat false. False.

b) Knowing how to read is very important.

True. Somewhat true. Somewhat false. False.

c) During your free time, YOU read very often.

True. Somewhat true. Somewhat false. False.

d) YOU enjoy reading very much.

True. Somewhat true. Somewhat false. False.

Appendix I

Activity Choice Questionnaire (Grant, 2007)

Below you will be two activities, and will be asked to choose the activity that you are more likely to do on any given day. Please put a check mark next to the one that you more typically would carry out. Even if you would prefer not to do either activity, please pick the one that you would be more likely to do. For each item, please mark only one choice.

1. I am more likely to:
___ listen to music of my choice
___ watch a television program of my choice

2. I am more likely to:
___ cook or clean at home
___ listen to music of my choice

3. I am more likely to:
___ spend time on my hobbies
___ attend a movie of my choice

4. I am more likely to:
___ spend time on my hobbies
___ watch a television program of my choice

5. I am more likely to:
___ read a book of my choice
___ exercise or work out

6. I am more likely to:
___ cook or clean at home
___ spend time on my hobbies

7. I am more likely to:
___ attend a movie of my choice
___ talk on the phone with family or friends

8. I am more likely to:
___ read a book of my choice
___ listen to music of my choice

9. I am more likely to:
___ exercise or work out
___ attend a movie of my choice

10. I am more likely to:
___ talk on the phone with family or friends
___ read a book of my choice

11. I am more likely to:
___ watch a television program of my choice
___ talk on the phone with family or friends

12. I am more likely to:
___ cook or clean at home
___ exercise or work out

13. I am more likely to:
___ exercise or work out
___ watch a television program of my choice

14. I am more likely to:
___ attend a movie of my choice
___ listen to music of my choice

15. I am more likely to:
___ read a book of my choice
___ cook or clean at home

16. I am more likely to:
___ talk on the phone with family or friends
___ spend time on my hobbies

Appendix J
Reading and Writing Self-Efficacy Questionnaire
(adapted from Shell et al., 1995, p. 388)

Please circle the number that indicates how sure you are that you could do each of the following tasks:

A) read a letter from a friend

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

B) read the daily newspaper

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

C) read a book from the library

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

D) know all the words on a page in one of your school books

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

E) know the meaning of plurals, prefixes, and suffixes

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

F) identify parts of speech

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

G) understand the main idea of a story

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

H) write a 1-page summary of a book you read

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

I) write a story about what you did on summer vacation

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

J) use correct plurals, prefixes, and suffixes in your writing

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

K) get your point across in your writing

1----------2----------3----------4----------5
I'm sure I can't don't think I can maybe I can pretty sure I can I'm sure I can

Now, please circle the number that indicates how likely you are to do the following:

L) read for fun?

1----------2----------3----------4----------5
not at all likely slightly likely moderately likely very likely completely likely

Appendix K

Children's Weekly Reading and Homework Questionnaires

CASP I.D. # : _____ Week #: _____

1. About how much time did you spend reading this week?

a. For fun?

Did not read _____ ½ hour _____ 1 hour _____ 2 hours _____

3-4 hours _____ 5-7 hours_____ 7+ hours _____

b. For school?

Did not read _____ ½ hour _____ 1 hour _____ 2 hours _____

3-4 hours _____ 5-7 hours_____ 7+ hours _____

2. About how much time did you spend doing homework this week?

Did not do homework _____ ½ hour _____ 1 hour _____

2 hours _____ 3-4 hours _____ 5-7 hours_____ 7+ hours _____

Appendix L

Literacy Tips Provided to Parents/ Guardians in the BRSS Program

Week 1:

You can help your child gain understanding of what they read by talking about how it relates to things they already know about, such as events in their lives, their favourite TV shows, or hobbies (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 15)!

Week 2:

You can help your child to gain an understanding about what they are reading by reading with them daily and asking them questions about what you are reading (e.g., What will happen next?) (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 15).

Week 3:

When your child reads a book, ask them to tell you about what they read. Your child can tell you, or show you in a skit or cartoon (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 16).

Week 4:

Home Literacy Tip of the Week: You can ask your children what they think about a TV show or song and to explain why they feel that way. This will help children learn to share their perspective and justify it (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 16).

Week 5:

When spending time with your family and friends, your child can practice how to develop stories if you invite them to create stories and tell them to the group (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 17).

Week 6:

Long car rides, travel, or wait times for appointments are a great time to have fun with reading. You can bring along books or kids magazines and activity books to help pass the time (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 17).

Week 7:

Encourage your child to read with their friends and family by providing materials with jokes and fun quizzes that they will want to share (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 18).

Week 8:

Be a role model for literacy development for your child- read aloud as you write a journal about a fun day, a shopping list, or a letter (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 18).

Week 9:

Encourage your child to come up with fun games involving words, music, or storytelling, or play word games with your child (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 19).

Week 10:

Home Literacy Tip of the Week: Discuss advertisements with your child and ask them what they think about the advertisements. Then, you and your child can come up with an advertisement (print ad, or a TV or radio ad) that you think would do a better job of advertising a product (adapted from Ministry of Education: The Literacy and Numeracy Secretariat, 2007, p. 20).

Appendix M

Sample Lesson Plan for BRSS Program

Approximate Time	**Activities**
4:30 pm	-Complete Children's Weekly Reading and Homework Questionnaires
4:35 pm	-Review of last week's lesson and discuss chapters 1 and 2 of the *Superfudge* Books (Blume, 1980/2007) while asking children questions about what they read
4:45 pm	-Discussed how students can use surrounding text to understand the meaning of a word they do not know (with examples)
4:50 pm	-Complete worksheets (assisted by facilitators) that involve using their *Superfudge* (Blume, 1980/2007) books to look up a page to find a word that is likely unfamiliar to them (provided on the worksheet) and use the surrounding text to try to determine meaning, then use a dictionary to check definition. -Children can draw pictures to help them remember the meaning of these words
5:10 pm	-Discuss temperatures and insulation because the *Superfudge* (Blume, 1980/2007) story mentioned a game of Hot and Cold -Make insulating boxes for ice cubes with various materials (children decide if each material would insulate well or not, and group will discuss) -Ask children to check on their ice cubes a few times that evening and record the time at which it is completely melted
5:25 pm	-Tidy up and ask children to read chapters 3 and 4 of their *Superfudge* (Blume, 1980/2007) books before next week's program

Appendix N

Sample Invitation Letter Template for Control Group Workshop

[date]

Better Reading for School Success Study: Workshop for Control Group Families!

Hello,

On behalf of the Better Reading for School Success team, I would like to thank you for allowing your child to participate in our study as part of the control group!

As promised, we will be offering a ***FREE*** workshop for parents/guardians of children in the control group regarding fun ways that literacy skills can be encouraged at home. This workshop will be hosted by Dr. Alexandra Gottardo at **[name of school] ([address of school]) on [date] from [time] to [time]**. If you will be attending, please meet us at the [room] at [name of school] when you arrive.

While the workshop is being run for parents/guardians, I will be leading activities in the [room in which activities will be carried out] for the children who participated in our control group as well! Coffee, popcorn, and juice boxes will be provided. In order to plan for the amount of food we will need to bring, **we would appreciate if you would please let us know whether you plan to attend and the number of people in your family who plan to attend by emailing me at [email address] by [date].**

Thank you, and I look forwarding to hearing from you!

Melissa Dol (M.A. Candidate- Wilfrid Laurier University)

Appendix O

Comparisons of Difference Scores on Literacy Measures Across Groups with SES Covariate

Measure	Intervention vs. Control				PR/BRSS vs. BRSS vs. Control			
	Df	*F*	*P*	η^2	*df*	*F*	*p*	η^2
Comp	1, 41	4.00	.052†	.089	2, 40	2.02	.147	.092
Voc	1, 41	1.30	.260	.031	2, 40	0.64	.534	.031
SW	1, 41	3.02	.090	.069	2, 40	1.65	.205	.076
PD	1, 41	1.18	.284	.028	2, 40	0.74	.484	.036
Att	1, 41	3.63	.064	.081	2, 40	4.86	.013*	.196
ID	1, 41	0.84	.365	.020	2, 40	0.88	.424	.042
RL	1, 41	0.00	.970	.000	2, 40	0.06	.939	.003
RD	1, 41	0.02	.901	.000	2, 40	0.01	.987	.001
ON-En	1, 41	0.17	.680	.004	2, 40	0.70	.500	.034
ON-Oth	1, 8	1.35	.279	.144	2, 7	1.98	.208	.361

Note. †p= .052, * $p < .05$. Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised-Word Identification subtest; RL = Comprehensive Test of Phonological Processing-Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language).

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Table 1

Numbers of Recruited Participants in Each Group and Response Rates

Time and School	Total Number of Children in Grades Included	Number (%) of Children Recruited for Study-Intervention Group	Number of Children Invited to Control Group	Number (%) of Invited Children Taking Part in Study- Control Group (Based on # Invited to Group)
Fall 2012				
School A	100	5 (5.0%)	20	11 (55.0%)
Spring 2013				
School B	78	5 (6.4%)	20	4 (20.0%)
School C	110	1 (0.9%)	10	3 (30.0%)
Fall 2013				
School C	117	N/A	9	1 (11.1%)
School D	130	14 (10.8%)	15	1 (6.7%)
Food Bank	N/A	2 (N/A)	N/A	N/A

Note. Total number of potential participants in Grades 3 to 6 was not available for the Food Bank location because it was open to a variety of clients at the food bank. All families were invited to take part in the interventions- the researchers do not have access to the full lists of people who requested a spot in the program but did not get offered a spot with Project READ. In the BRSS program, all children who returned consent packages were admitted. Consents for control group were only sent to a subset of students after time to return intervention consent packages was allowed, and numbers are estimated because consent forms were given to schools but they may not have distributed all of them.

Table 2

Descriptive Statistics of Parents and/or Guardians by Group Based on Pretest Questionnaires

Variable	BRSS		Control	
	N	*Mdn* (IQR) **M* (*SD*)	*n*	*Mdn* (IQR) **M* (*SD*)
Education	12	5.00 (3.13)	19	5.00 (2.50)
Occupation in Canada	11	3.00 (6.00)	19	6.00 (4.00)
Occupation in Previous Country	3	5.00 (---)	2	8.00 (---)
English Ability	11	4.00 (0.00)	18	4.00 (0.00)
English Usage	11	6.00 (0.00)	18	5.50 (1.25)
Other Language Ability	2	3.00 (---)	4	3.25 (1.88)
Other Language Usage	3	3.00 (---)	5	4.00 (2.00)
Number of Children	12	*2.17 (1.03)	19	2.05 (1.43)
Birth Order of Child in Study	12	1.50 (1.00)	19	1.00 (1.00)

Note. Education based on Hollingshead's (1975) 7-point scale. Occupations were also based on Hollingshead's (1975) 9-point scale, adjusted to a 10-point scale to include a 0 for unemployed or homemakers. Language Ability scores are totals based on 0, 0.5, 1 for each question regarding language ability (for a maximum possible score of 4.00) in the Demographic Questionnaire (adapted from Van Andel, 2011). Language Usage scores are totals based on 0, 0.5, 1, for each question regarding language usage (for a maximum possible score of 6.00) in the Demographic Questionnaire (adapted from Van Andel, 2011). Higher scores on Language Ability indicate better ability to use the language, and higher scores on language usage indicate usage across a greater variety of social situations. Participants in the PR/BRSS programs did not complete this questionnaire.

Table 3

Self-Reported Literacy Activities and Beliefs by Group at Pretest

Variable	BRSS		Control	
	n	*Mdn* (IQR) **M* (*SD*)	*n*	*Mdn* (IQR) **M* (*SD*)
Frequency of Obtaining Newspapers	13	4.00 (2.50)	19	4.00 (3.00)
Frequency of Obtaining Magazines	13	3.00 (0.75)	17	3.00 (1.00)
Frequency of Library Trips	13	3.00 (4.00)	18	1.00 (2.00)
Number Books from Library	6	*3.17 (0.93)	14	*2.75 (1.25)
Number Books Adults Own	13	5.00 (1.00)	19	5.00 (1.00)
How Often Read to Child	13	3.00 (2.00)	18	4.00 (2.25)
Number Books Children Own	13	5.00 (1.00)	19	5.00 (1.00)
Free Time Child Reads Often	13	3.00 (3.00)	19	2.00 (1.00)
Knowing How to Read is Very Important	13	All responded 1	19	All responded 1
During Free Time, Adults Read Often	12	2.00 (1.00)	19	1.00 (1.00)
Adults Enjoy Reading	12	1.00 (1.00)	19	1.00 (1.00)
Activity Choice-Book	13	*2.23 (1.69)	19	*2.32 (1.45)

Note. All items except the last one were from the Demographic Questionnaire (adapted from Van Andel, 2011). Frequency of Obtaining Newspapers options were 1 = *Daily*, 2 = *Three times a week*, 3 = *Once a week*, and 4 = *Rarely*. Frequency of Obtaining Magazines options were 1 =*More than one time a week*, 2 = *Once a week*, 2.5 = *Once a month* (added by participant), 3 =*Rarely*, 3.5 = *Never* (added by participant). Frequency of Library Trips options were 1 = *Once a week*, 2 = *Twice a week*, 3 = *Once a month*, 3.5 = *Twice a month* (added by participant), 4= *Once a year*, 5 = *Never*. Number of Books from Library was reported as average value if parent and/or guardian reported a range. The item, Number Books Adults Own, was responded to on a scale of 1 = *None*, 2 = *From 1-5*, 3 = *From 5-10*, 4 = *From 10-25*, 5 = *25 or more*. The items, How Often Read to Child was on a scale of 1 = *Daily*, 2 = *5 times a week*, 3 = *3 times a week*, 4 = *Once a week*, so lower scores meant they read with their child more often. The item, Number Books Children Own, was on a scale of 1 = *None*, 2 = *From 1-5*, 3 = *From 6 -10*, 4 = *From 10-25*, and 5 = *25 or more*. The items, Free Time Child Reads Often; Knowing How to Read is Very Important; During Free Time, Adults Read Often; and Adults Enjoy Reading were reported on a scale of 1 = *True*, 2 = *Somewhat true*, 3 = *Somewhat false*, and 4 = *False.*

Activity Choice-Book refers to the numbers of times participants chose *read a book of my choice* on the Activity Choice Questionnaire (Grant, 2007) over the other options out of a total of 4 possible times.

Table 4

Parent/Guardian Self-Reports Regarding Who Reads to Child and Available Reading Materials

Variable		BRSS	Control
		n	*n*
Who Reads to Child	Respondents	8	15
	Parent/ Guardian/ Older Relative (Except Sibling)	6 (75.00%)	4 (26.67%)
	Child Reads Themselves	6 (75.00%)	14 (93.33%)
	Sibling	2 (25.00%)	0 (0.00%)
Types of Newspapers	Respondents	5	11
	Local Regional/ City Newspaper	4 (80.00%)	9 (81.82%)
	Other City Newspaper	0 (0.00%)	1 (9.09%)
	Global Newspaper	1 (20.00%)	1 (9.09%)
	Special Interest News	0 (0.00%)	1 (9.09%)
	Online (Newspaper Not Specified)	0 (0.00%)	1 (9.09%)
Types of Magazines	Respondents	5	9
	Hobby/ Interest Magazine for Adults	3 (60.00%)	7 (77.78%)
	Profession/ Career-Based Magazine for Adults	1 (20.00%)	0 (0.00%)
	Religious Magazine	1 (20.00%)	1 (11.11%)
	Children's Magazine	1 (20.00%)	3 (33.33%)

Note. Data collected on Demographic Questionnaires (adapted from Van Andel, 2011) at pretest. Number of respondents falling into each category of types of newspapers and magazines is the number of respondents mentioning each type of newspaper and magazines at least once; this is why percentages add up to greater than 100.00% in some cases. There were 13 participants in the BRSS group and 20 participants in the control group.

Table 5

Summary of Testing Battery Measures Completed at Pretest Only or at Both Pretest and Posttest

Construct Measured	Testing Battery Measure(s)	Completed at Pretest Only	Completed at Posttest
Non-Verbal Intelligence	(MAT-EF)- Subtest 2 (Reasoning by Analogy) and Subtest 4 (Spatial Visualization	X	
Phonological Awareness	CTOPP- Elision Subtest	X	
Phonological Processing Speed	CTOPP- Rapid Letter Naming & Rapid Digit Naming Subtests	X	X
Reading Comprehension	GMRT-Reading Comprehension Subtest	X	X
Vocabulary	GMRT- Vocabulary Subtest	X	X
Reading Fluency	TOWRE- Sight Word Efficiency & Phonemic Decoding Efficiency Subtests	X	X
Reading Accuracy	WRMT-R- Word Attack & Word Identification Subtests	X	X
Verbal Fluency	Oral Naming Fluency Task	X	X

Note. MAT-EF = Matrix Analogies Test- Expanded Form (Naglieri, 1985); CTOPP = Comprehensive Test of Phonological Processing (Wagner, Torgesen & Rashotte, 1999); GMRT = Gates-MacGinitie Reading Test (2nd Canadian ed.) (MacGinitie & MacGinitie, 1992); TOWRE = Test of Word Reading Efficiency (Torgesen, Wagner, & Rashotte, 1999); Oral Naming Fluency Task (adapted from Gollan, Montoya, & Werner, 2002) was completed in English by all participants and in the first language of any participants for whom English was not their first language, if they felt comfortable using the first language for the task.

Table 6

Means and Standard Deviations of Raw Scores at Pretest

Measure	Intervention									Control			All Participants		
	PR/BRSS			BRSS			Total Int.								
	N	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
MAT2	11	10.73	2.10	13	6.15	4.65	24	8.25	4.32	20	10.10	3.19	44	9.09	3.92
MAT4	11	7.18	4.40	13	1.92	2.25	24	4.33	4.27	20	5.40	4.82	44	4.82	4.50
Elision	11	17.64	1.69	13	9.38	4.29	24	13.17	5.34	20	15.50	4.56	44	14.23	5.08
Comp.	11	21.09	7.66	13	12.54	5.47	24	16.46	7.75	20	21.70	9.58	44	18.84	8.92
Vocab.	11	20.09	8.10	13	10.46	6.84	24	14.88	8.77	20	21.30	9.71	44	17.80	9.66
TOWRE-SW	11	65.55	8.86	13	45.62	18.14	24	54.75	17.57	20	69.25	11.94	44	61.34	16.78
TOWRE-PD	11	37.45	8.78	13	19.00	10.42	24	27.46	13.35	20	40.10	12.63	44	33.20	14.37
Word Attack	11	30.91	6.49	13	15.85	5.74	24	22.75	9.71	20	31.30	9.66	44	26.64	10.50
Word ID	11	69.36	7.39	13	46.54	16.66	24	57.00	17.42	20	70.50	14.48	44	63.14	17.36
RAN Letter	11	35.64	6.00	13	51.31	16.46	24	44.12	14.85	20	36.60	7.60	44	40.70	12.57
RAN Digits	11	34.64	4.61	13	49.69	14.05	24	42.79	13.07	20	34.60	8.39	44	39.07	11.82
Oral Naming (Eng.)	11	76.73	11.38	13	56.92	10.68	24	66.00	14.74	20	71.35	10.98	44	69.43	13.30
Oral Naming (Other)	4	43.50	16.01	3	35.33	29.02	7	40.00	20.69	4	25.00	13.59	11	34.55	19.22

Note. MAT2 = Matrix Analogies Test –Expanded Form- Reasoning by Analogy subtest; MAT4 = Matrix Analogies Test – Expanded Form- Spatial Visualization; Elision = Comprehensive Test of Phonological Processing- Elision subtest; Comp. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Vocab. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; TOWRE-SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; TOWRE-PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Word Attack = Woodcock Reading Mastery Test-Revised-Word Attack subtest; Word ID = Woodcock Reading Mastery Test-Revised- Word Identification subtest; RAN Letter = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RAN Digit = Comprehensive Test of Phonological Processing- Rapid Digit Naming subtest; Oral Naming (Eng.) = Oral Naming Fluency Task (English); Oral Naming (Other) = Oral Naming Fluency Task (First Language).

Table 7

Means and Standard Deviations of Raw Scores at Posttest

Measure	Intervention									Control			All Participants		
	PR/BRSS			BRSS			Total Int.								
	N	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Comp.	11	23.18	9.95	13	13.85	5.76	24	18.12	9.10	20	20.50	10.22	44	19.20	9.59
Vocab.	11	21.91	8.89	13	12.31	6.34	24	16.71	8.90	20	21.65	10.74	44	18.95	9.98
TOWRE-SW	11	69.36	8.80	13	50.23	19.87	24	59.00	18.29	20	71.50	13.08	44	64.68	17.15
TOWRE-PD	11	40.00	10.54	13	19.62	10.28	24	28.96	14.53	20	39.80	15.42	44	33.89	15.74
Word Attack	11	32.45	5.16	13	22.46	5.88	24	27.04	7.45	20	32.40	10.07	44	29.48	9.04
Word ID	11	71.82	8.07	13	50.85	15.87	24	60.46	16.55	20	75.55	16.38	44	67.32	17.97
RAN Letter	11	34.91	6.02	13	49.69	24.23	24	42.92	19.46	20	35.25	7.64	44	39.43	15.60
RAN Digits	11	33.82	7.14	13	48.92	21.03	24	42.00	17.66	20	34.00	9.25	44	38.36	14.86
Oral Naming (Eng.)	11	75.45	15.66	13	58.00	13.04	24	66.00	16.56	20	72.70	12.64	44	69.05	15.12
Oral Naming (Other)	4	46.00	13.90	3	44.00	33.87	7	45.14	21.91	4	25.00	9.76	11	37.82	20.49

Note. Comp. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Vocab. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; TOWRE-SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; TOWRE-PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Word Attack = Woodcock Reading Mastery Test-Revised -Word Attack subtest; Word ID = Woodcock Reading Mastery Test-Revised - Word Identification subtest; RAN Letter = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RAN Digit = Comprehensive Test of Phonological Processing- Rapid Digit Naming subtest;

Oral Naming (Eng.) = Oral Naming Fluency Task (English); Oral Naming (Other) = Oral Naming Fluency Task (First Language).

Table 8

Means and Standard Deviations of Raw Difference Scores

Measure	Intervention									Control			All Participants		
	PR/BRSS			BRSS			Total Int.								
	N	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Comp.	11	2.09	4.93	13	1.31	4.03	24	1.67	4.38	20	-1.20	5.07	44	0.36	4.87
Vocab.	11	1.82	4.02	13	1.85	3.00	24	1.83	3.42	20	0.35	5.09	44	1.16	4.28
TOWRE-SW	11	3.83	2.56	13	4.62	4.93	24	4.25	3.96	20	2.25	3.54	44	3.34	3.86
TOWRE-PD	11	2.55	5.20	13	0.62	4.75	24	1.50	4.95	20	-0.30	6.63	44	0.68	5.78
Word Attack	11	1.55	3.50	13	6.62	5.66	24	4.29	5.36	20	1.10	5.57	44	2.84	5.63
Word ID	11	2.45	4.50	13	4.31	3.77	24	3.46	4.14	20	5.05	6.92	44	4.18	5.57
RAN Letter	11	-0.73	5.41	13	-1.62	14.47	24	-1.21	11.05	20	-1.35	4.12	44	-1.27	8.54
RAN Digits	11	-0.82	4.64	13	-0.77	9.29	24	-0.79	7.38	20	-0.60	3.66	44	-0.70	5.92
Oral Naming (Eng.)	11	-1.27	11.30	13	1.08	10.67	24	0.00	10.78	20	1.35	7.98	44	0.61	9.53
Oral Naming (Other)	4	2.50	3.11	3	8.67	9.45	7	5.14	6.74	4	0.00	4.90	11	3.27	6.42

Note. Comp. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Vocab. = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; TOWRE-SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; TOWRE-PD = Test of Word Reading Efficiency -Phonemic Decoding Efficiency subtest; Word Attack = Woodcock Reading Mastery Test-Revised -Word Attack subtest; Word ID = Woodcock Reading Mastery Test-Revised - Word Identification subtest; RAN Letter = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RAN Digit = Comprehensive Test of Phonological Processing- Rapid Digit Naming subtest;

Oral Naming (Eng.) = Oral Naming Fluency Task (English); Oral Naming (Other) = Oral Naming Fluency Task (First Language).

Table 9

Comparisons of Difference Scores on Literacy Measures Across Groups

Measure	Intervention vs. Control				PR/BRSS vs. BRSS vs. Control			
	df	*F*	*P*	η^2	*df*	*F*	*p*	η^2
Comp	1, 42	4.05†	.051	.088	2, 41	2.06	.140	.091
Voc	1, 42	1.32	.257	.031	2, 41	0.65	.529	.031
SW	1, 42	3.06	.087	.068	2, 41	1.64	.207	.074
PD	1, 42	1.06	.309	.025	2, 41	0.86	.432	.040
Att	1, 42	3.73	.060	.082	2, 41	4.94*	.012	.194
ID	1, 42	0.89	.351	.021	2, 41	0.77	.471	.036
RL	1, 42	0.00	.957	.000	2, 41	0.03	.968	.002
RD	1, 42	0.01	.916	.000	2, 41	0.01	.994	.000
ON-En	1, 42	0.22	.645	.005	2, 41	0.28	.757	.014
ON-Oth	1, 9	1.76	.218	.163	2, 8	1.90	.212	.321

Note. †p= .051, * $p < .05$. Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised-Word Identification subtest; RL = Comprehensive Test of Phonological Processing-Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language).

Table 10

Comparisons of Pretest, Posttest, and Difference Scores Across PR/BRSS and BRSS Programs

Measure	Scores											
	Pretest				Posttest				Difference			
	Df	*F*	*p*	η^2	*df*	*F*	*p*	η^2	*df*	*F*	*P*	η^2
MAT2	1, 22	9.02**	.007	.291	-	-	-	-	-	-	-	-
MAT4	1, 22	14.24**	.001	.393	-	-	-	-	-	-	-	-
EL	1, 22	35.76***	<.001	.619	-	-	-	-	-	-	-	-
Comp	1, 22	10.13**	.004	.315	1, 22	8.24**	.009	.272	1, 22	.18	.672	.008
Voc	1, 22	9.98**	.005	.312	1, 22	9.49**	.005	.301	1, 22	.00	.985	.000
SW	1, 22	11.00**	.003	.333	1, 22	8.70**	.007	.283	1, 22	.23	.634	.011
PD	1, 22	21.54***	<.001	.495	1, 22	22.91***	<.001	.510	1, 22	.90	.353	.039
Att	1, 22	36.42***	<.001	.623	1, 22	19.20***	<.001	.466	1, 22	6.64*	.017	.232
ID	1, 22	17.61***	<.001	.445	1, 22	15.69**	.001	.416	1, 22	1.20	.284	.052
RL	1, 22	8.91**	.007	.288	1, 22	3.87	.062	.150	1, 22	.04	.850	.001
RD	1, 22	11.51**	.003	.344	1, 22	5.14*	.034	.189	1, 22	.00	.988	.000
ON-En	1, 22	19.30***	<.001	.467	1, 22	8.89**	.007	.288	1, 22	.27	.606	.012
ON-Oth	1, 5	.233	.650	.045	1, 5	.012	.917	.002	1, 5	1.57	.266	.239

*Note. *p < .05, ** p < .01, ***p < .001.* MAT2 = Matrix Analogies Test –Expanded Form - Reasoning by Analogy subtest; MAT4 = Matrix Analogies Test –Expanded Form- Spatial Visualization; EL = Comprehensive Test of Phonological Processing- Elision subtest; Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised- Word Identification subtest; RL = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language).

Table 11

Correlations Between Measures at Pretest

Measure	MAT2	MAT4	EL	Comp	Voc	SW	PD	Att	ID	RL	RD	ON-En	ON-Oth
MAT2	-	-	-	-	-	-	-	-	-	-	-	-	-
r													
p													
MAT4		-	-	-	-	-	-	-	-	-	-	-	-
r	.64***												
p	<.001												
EL			-	-	-	-	-	-	-	-	-	-	-
r	.49**	.40**											
p	.001	.008											
Comp				-	-	-	-	-	-	-	-	-	-
r	.56***	.59***	.57***										
p	<.001	<.001	<.001										
Voc					-	-	-	-	-	-	-	-	-
r	.58***	.59***	.65***	.86***									
p	<.001	<.001	<.001	<.001									
SW						-	-	-	-	-	-	-	-
r	.56***	.35*	.69***	.54***	.66***								
p	<001	.021	<.001	<.001	<.001								
PD							-	-	-	-	-	-	-
r	.53***	.38*	.74***	.56***	.66***	.88***							
p	<.001	.010	<.001	<.001	<.001	<.001							
Att								-	-	-	-	-	-

r	.59***	.41**	.72***	.57***	.70***	.79***	.92***					
p	<.001	.006	<.001	<.001	<.001	<.001	<.001					
ID								-	-	-	-	-
r	.62***	.47**	.75***	.64***	.81***	.88**	.86***	.89***				
p	<.001	.001	<.001	<.001	<.001	<.001	<.001	<.001				
RL									-	-	-	-
r	-.43**	-.21	-.53***	-.35*	-.40**	-.70***	-.58***	-.54***	-.63***			
p	.003	.173	<.001	.019	.007	<.001	<.001	<.001	<.001			
RD										-	-	-
r	-.46**	-.19	-.66***	-.36*	-.43**	-.807***	-.73***	-.66***	-.74***	.88***		
p	.002	.223	<.001	.016	.004	<.001	<.001	<.001	<.001	<.001		
ON-En											-	-
r												
p	.50***	.38*	.64***	.66***	.59***	.65***	.62***	.60***	.65***	-.51***	-.62***	
	<.001	.012	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	
ON-Oth												-
r												
p	.64*	.44	-.02	.07	.04	.11	.02	.02	.17	-.46	-.16	.28
	.035	.176	.955	.840	.908	.754	.941	.964	.620	.156	.638	.412

Note. **p* < .05 (2-tailed), ***p* < .01 (2-tailed), ****p* < .001 (2-tailed). MAT2 = Matrix Analogies Test –Expanded Form - Reasoning by Analogy subtest; MAT4 = Matrix Analogies Test –Expanded Form- Spatial Visualization; EL = Comprehensive Test of Phonological Processing- Elision subtest; Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised- Word Identification subtest; RL = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language). All correlations have *n* of 44, except for correlations between ON-Oth and other measures, which have *n* of 11.

Table 12

Correlations Between Measures at Posttest

Measure	Comp	Voc	SW	PD	Att	ID	RL	RD	ON-En	ON-Oth
Comp	-	-	-	-	-	-	-	-	-	-
r										
p										
Voc		-	-	-	-	-	-	-	-	-
r	.85***									
p	<.001									
SW			-	-	-	-	-	-	-	-
r	.44**	.58***								
p	.003	<.001								
PD				-	-	-	-	-	-	-
r	.485**	.66***	.86***							
p	.001	<.001	<.001							
Att					-	-	-	-	-	-
r	.50***	.698***	.68***	.86***						
p	<.001	<.001	<.001	<.001						
ID						-	-	-	-	-
r	.59***	.77***	.89***	.89***	.85***					
p	<.001	<.001	<.001	<.001	<.001					
RL							-	-	-	-
r	.25	-.27	-.75***	-.56***	-.39**	-.63***				
p	.108	.078	<.001	<.001	.008	<.001				
RD								-	-	-

r	-.22	-.29	-.78***	-.62***	-.43**	-.65***	.94***			
p	.152	.056	<.001	<.001	.003	<.001	<.001			
ON-En									-	-
r	.48**	.51***	.61***	.60***	.42**	.60***	-.46**	-.46**		
p	.001	<.001	<.001	<.001	.005	<.001	.002	.002		
ON-Oth										-
r	.07	-.07	-.16	-.25	-.30	-.07	-.38	.11	.31	
p	.834	.829	.627	.459	.362	.839	.252	.747	.360	

Note. *$p < .05$ (2-tailed), **$p < .01$ (2-tailed), ***$p < .001$ (2-tailed). Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised- Word Identification subtest; RL = Comprehensive Test of Phonological Processing-Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language). All correlations have *n* of 44, except for correlations between ON-Oth and other measures, which have *n* of 11.

Table 13

Correlations Between Difference Scores and Age on Measures

Measure	Age	Comp	Voc	SW	PD	Att	ID	RL	RD	ON-En	ON-Oth
Age	-	-	-	-	-	-	-	-	-	-	-
r											
p											
Comp		-	-	-	-	-	-	-	-	-	-
r	.02										
p	.919										
Voc			-	-	-	-	-	-	-	-	-
r	-.04	.42**									
p	.802	.005									
SW				-	-	-	-	-	-	-	-
r	.15	.23	.01								
p	.331	.137	.938								
PD					-	-	-	-	-	-	-
r	.24	-.04	.07	.06							
p	.116	.786	.661	.708							
Att						-	-	-	-	-	-
r	-.30*	-.04	.18	.03	.34*						
p	.047	.778	.245	.829	.025						
ID							-	-	-	-	-
r	-.11	-.24	.00	.09	.26	.38					
p	.471	.118	.996	.580	.095	.011					
RL								-	-	-	-

r	-.04	.00	.26	-.32*	.06	-.06	-.10				
p	.790	.993	.085	.033	.701	.722	.526				
RD								-	-	-	
r	-.22	.03	.12	-.19	.04	-.00	.02	.55***			
p	.161	.838	.433	.213	.823	.982	.886	<.001			
ON-En									-	-	
r	-.20	-.07	.25	.16	.08	-.03	.19	.19	.16		
p	.191	.663	.104	.302	.600	.850	.216	.222	.307		
ON-Oth										-	
r	-.62*	.54	-.03	-.04	-.26	-.08	-.29	.62*	.71*	.37	
p	.040	.089	.936	.919	.432	.815	.385	.040	.015	.262	

Note. *$p < .05$ (2-tailed), **$p < .01$ (2-tailed), ***$p < .001$ (2-tailed). Age = Age from first testing in months. Comp = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Reading Comprehension subtest- form D level 5/6; Voc = Gates-MacGinitie Reading Test (2nd Canadian ed.)–Vocabulary subtest- form D level 5/6; SW = Test of Word Reading Efficiency- Sight Word Efficiency subtest; PD = Test of Word Reading Efficiency-Phonemic Decoding Efficiency subtest; Att = Woodcock Reading Mastery Test-Revised -Word Attack subtest; ID = Woodcock Reading Mastery Test-Revised- Word Identification subtest; RL = Comprehensive Test of Phonological Processing- Rapid Letter Naming subtest; RD = Comprehensive Test of Phonological Processing - Rapid Digit Naming subtest; ON-En = Oral Naming Fluency Task (English); ON-Oth = Oral Naming Fluency Task (First Language). All correlations have *n* of 44, except for correlations between ON-Oth and other measures, which have *n* of 11.

Table 14

Kinds of Things Parents and/or Guardians do to Help Children with Homework

	BRSS		Control	
Pretest: What kinds of things do you do to help your children with homework that they bring from school?	Themes:	*n*	Themes:	*n*
	-Sit with them/ keep them company	6	-Sit with them/ keep them company	3
	-Work through it or go over it together	8	-Work through it or go over it together	14
	-Check it over for child	1	-Check it over for child	5
	-Additional activities/ games/ examples/resources	4	-Additional activities/ games/ examples/ resources	7
			-Teach new ways of doing things	1
			-Child does not have homework	1
			-Encourage, motivate, remind	2
Posttest: What kinds of things do you do to help your children with homework that they bring from school?	Themes:	*n*	Themes:	*n*
	-Sit with them/ keep them company	1	-Sit with them/ keep them company	2
	-Work through it or go over it together	2	-Work through it or go over it together	7
	-Check it over for child	2	-Check it over for child	1
	-Focus on specific school topics	1	-Additional activities/ games/ examples/ resources	3
	-Tutor	1		

Note. Number of respondents for this question in the BRSS group was 11 at pretest and 4 at posttest. Number of respondents for this question in the control group was 19 at pretest and 7 at posttest.

Table 15

Other Things Parents and/or Guardians do to Help Children do Better at School

	BRSS		Control	
Pretest: What other things do you do at home to help your children do better at school?	Themes:	*n*	Themes:	*n*
	-Additional activities/ games/ examples/ resources	6	-Additional activities/ games/ examples/ resources	11
	-Encourage reading at home	4	-Encourage reading at home	8
	-Library trips	1	-Library trips	2
	-General statement about teaching child	1	-General statement about teaching child	1
	-Focus on specific school topics	3	- Talk about value of education/ talk about/encourage focus on school	5
	-Talk about value of education/ talk about/encourage focus on school	2	-Reported they did not do much else or no time for anything else	2
			-Provide a quiet area for homework	1
Posttest: What other things do you do at home to help your children do better at school?	Themes:	*n*	Themes:	*n*
	-Additional activities/ games/ examples/ resources	3	- Additional activities/ games/ examples/ resources	5
	-Encourage reading at home	1	-Encourage reading at home	5
	-Library trips	2	- Talk about value of education/ talk about/encourage focus on school	1
	-Focus on specific school topics	2	-Explain things/ answer questions	2
	- Talk about value of education/ talk about/encourage focus on school	1		

Note. Number of respondents for this question in the BRSS group was 10 at pretest and 4 at posttest. Number of respondents for this question in the control group was 18 at pretest and 6 at posttest.

Table 16

Things Parents/Guardians Would Like to be Able to do/ Things to Improve Ability to Help

	BRSS		Control	
Pretest: What would you like to be able to do to help your child more at school? What would improve your ability to help your child with school?	Themes:	*n*	Themes:	*n*
	-Better communication with school	1	-Better communication with school	3
	-Help child be more confident	1	-Help child be more confident	2
	-Understand curriculum	3	-Understand curriculum	6
	-Specific instructions on teaching children to read	2	-Extra resources/ activities/ suggestions	3
	-Extra resources/ activities/ suggestions	2	-More time	4
	-More time	1	-Have child be more engaged	1
	-Have child be more engaged	1	-More one-on-one time for child in classroom	1
			-Tutor	1
			-Better idea of where child needs to improve	2
Posttest: What would you like to be able to do to help your child more at school? What would improve your ability to help your child with school?	Themes:	*n*	Themes:	*n*
	-Understand curriculum	1	-Understand curriculum	2
	-Extra resources/ suggestions	2	-Extra resources/ suggestions	2
	-Have more time	1	-Have more time	1
	-Have child be more engaged	1	-Have child be more engaged	1
			-Know what goals should be set	1
			-Awareness of deadlines for homework	1

Note. Number of respondents for this question in the BRSS group was 9 at pretest and 4 at posttest. Number of respondents for this question in the control group was 15 at pretest and 7 at posttest.

Table 17

How Parents/Guardians Find Out How and What Their Child is Doing at School

	BRSS		Control	
Pretest: How do you find out how and what your child is doing at school?	Themes:	*n*	Themes:	*n*
	-Phone	1	-General contact with school staff	7
	-General contact with school staff	6	-Child	12
	-Meetings/ interviews	4	-Report cards	3
	-Child	5	- Items brought back and forth in backpack (e.g. planner, newsletter)	12
	-Report cards	1	-Website	4
	-Items brought back and forth in backpack (e.g. planner, newsletter)	3	-School events	1
	-Website	1	-Were not sure	1
Posttest: How do you find out how and what your child is doing at school?	Themes:	*n*	Themes:	*n*
	-Phone	1	-General contact with school staff	1
	-General contact with school staff	2	-Meetings/ interviews	1
	-Meetings/ interviews	2	-Child	2
	-Child	2	-Report cards	2
	-Items brought back and forth in backpack (e.g. planner, newsletter)	1	-Items brought back and forth in backpack (e.g. planner, newsletter)	4
	-School events	1	-School events	1
			-Website	3
			-Email	1

Note. Number of respondents for this question in the BRSS group was 12 at pretest and 4 at posttest. Number of respondents for this question in the control group was 19 at pretest and 7 at posttest.

Table 18

Methods for Communicating with School Selected from Questionnaire Options

Method		BRSS		Control	
		Pretest	Posttest	Pretest	Posttest
Communicate with Notes	*n*	12	3	18	6
	n (%) of respondents stating 'Yes'	12 (100%)	3 (100%)	18 (100%)	6 (100%)
Communicate by Telephone	*n*	12	3	16	6
	n (%) of respondents stating 'Yes'	11 (92%)	2 (67%)	12 (75%)	5 (83%)
Communicate by Email	*n*	7	2	12	5
	n (%) of respondents stating 'Yes'	3 (43%)	0 (0%)	6 (50%)	2 (40%)
Communicate in Scheduled Meetings	*n*	12	4	15	7
	n (%) of respondents stating 'Yes'	11 (92%)	4 (100%)	15 (100%)	7 (100%)
Communicate in Informal Meetings	*n*	9	3	10	4
	n (%) of respondents stating 'Yes'	7 (78%)	2 (67%)	7 (70%)	2 (50%)
Other Methods of Communication	*n*	2	1	4	2
	n (%) of respondents stating 'Yes'	1 (50%)	0 (0%)	1 (25%)	0 (0%)
Methods listed under 'Other'		-Stated that they requested meetings themselves	-N/A	-Stated that they may see teachers outside of school in the community and visit with them	-N/A

Note. The first *n* for each method of communication is the number of parents and/or guardians that responded to this questionnaire item by selecting either 'Yes' or 'No' for the communication method.

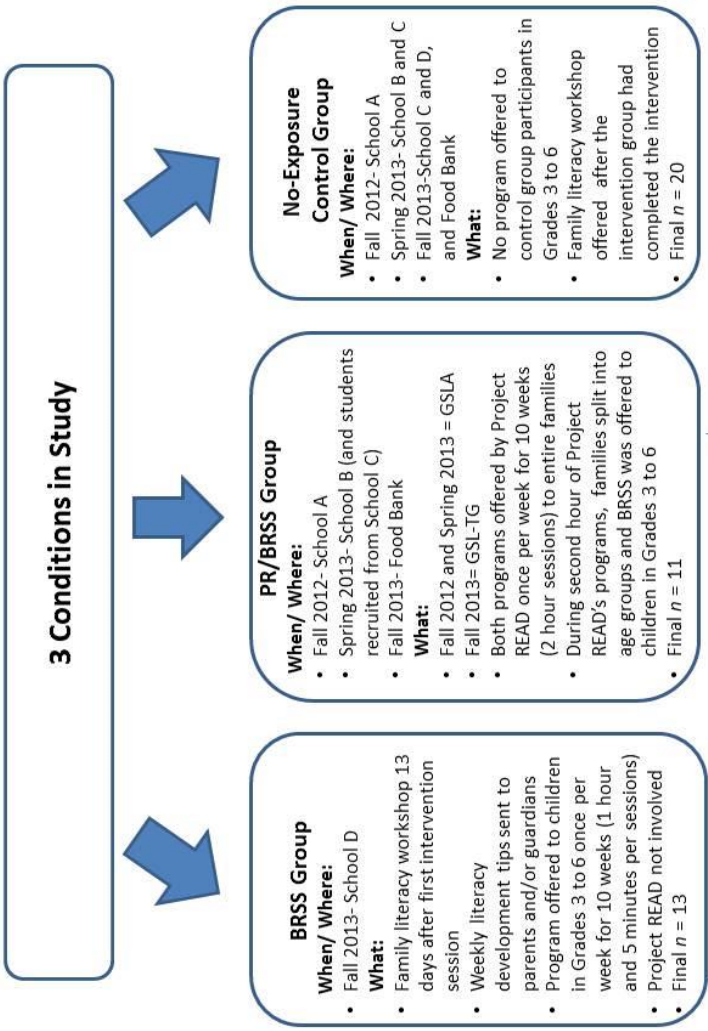

Figure 1. Summary of conditions in the study.

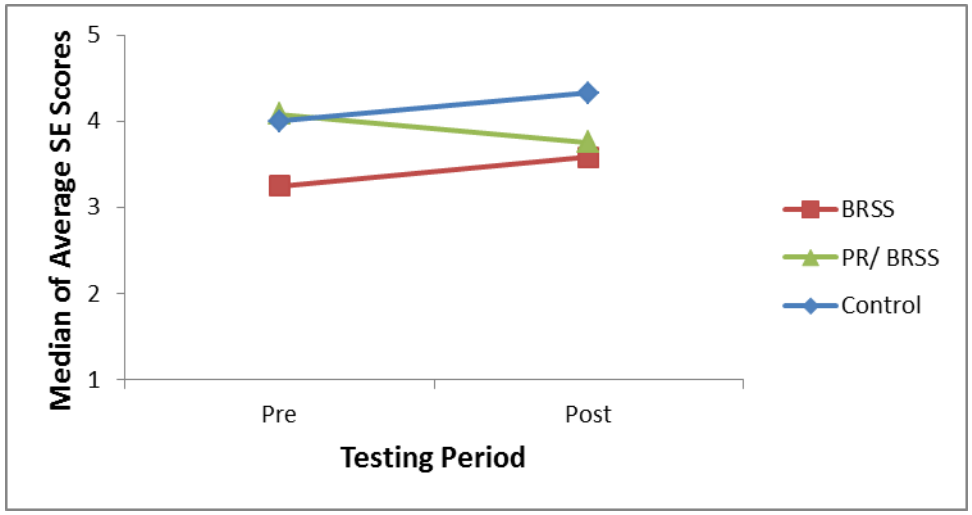

Figure 2. Self-reported self-efficacy on the Reading and Writing Self-Efficacy Questionnaire (adapted from Shell et al., 1995, p. 388) at pretest (Pre) and posttest (Post) for each group. Medians of the participants' average self-efficacy scores at each time period are graphed. Questions were answered on a 5-point Likert scale with higher values indicating higher self-efficacy. At pretest and posttest, 6 participants out of the 11 PR/BRSS group completed the self-efficacy questionnaire, 13 participants out of the 13 participants in the BRSS group completed the self-efficacy questionnaire, and 9 participants out of the 20 control group participants completed this questionnaire.

Figure 3. Self-reported amount of time spent on reading for fun during the week. Medians at each week are graphed. Category labels refer to the following: 0 = *Did not read*, 1 = *½ hour*, 2= *1 hour*, 3= *2 hours*, 4= *3-4 hours*, 5= *5-7 hours*, 6= *7+ hours*. Participant response numbers for the BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 6, 13, 12, 12, 11, 12, 11, 12, and 11, respectively. Participant response numbers for the PR/ BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 10, 10, 6, 8, 10, 11, 8, 9, and 8, respectively. Week 1 is not included because it was not included in analyses.

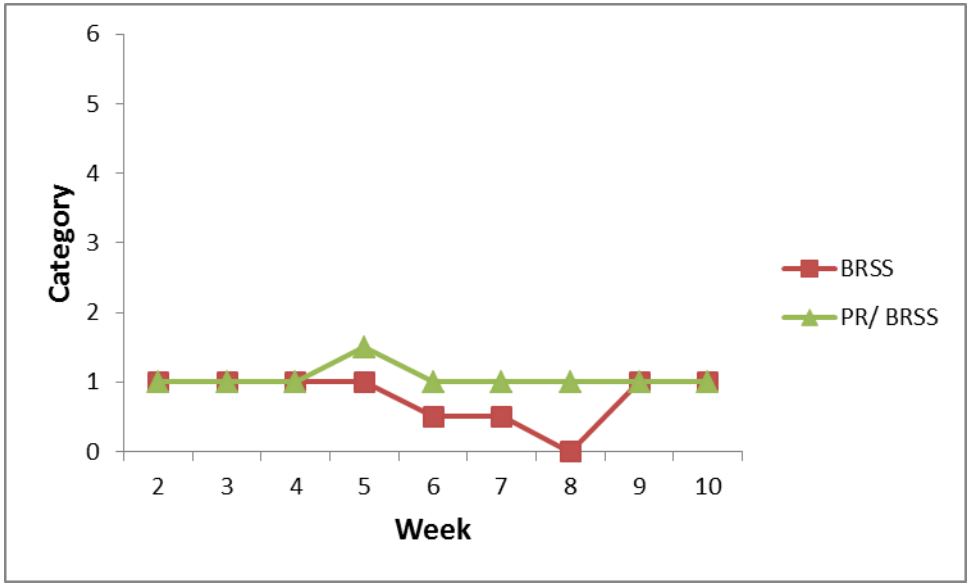

Figure 4. Self-reported amount of time spent on reading for school during the week. Medians at each week are graphed. Category labels refer to the following: 0 = *Did not read*, 1 = *½ hour*, 2= *1 hour*, 3= *2 hours*, 4= *3-4 hours*, 5= *5-7 hours*, 6= *7+ hours*. Participant response numbers for the BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 6, 12, 12, 13, 12, 12, 11, 12, and 11, respectively. Participant response numbers for the PR/ BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 10, 10, 6, 8, 10, 11, 8, 9, and 8, respectively. Week 1 is not included because it was not included in analyses.

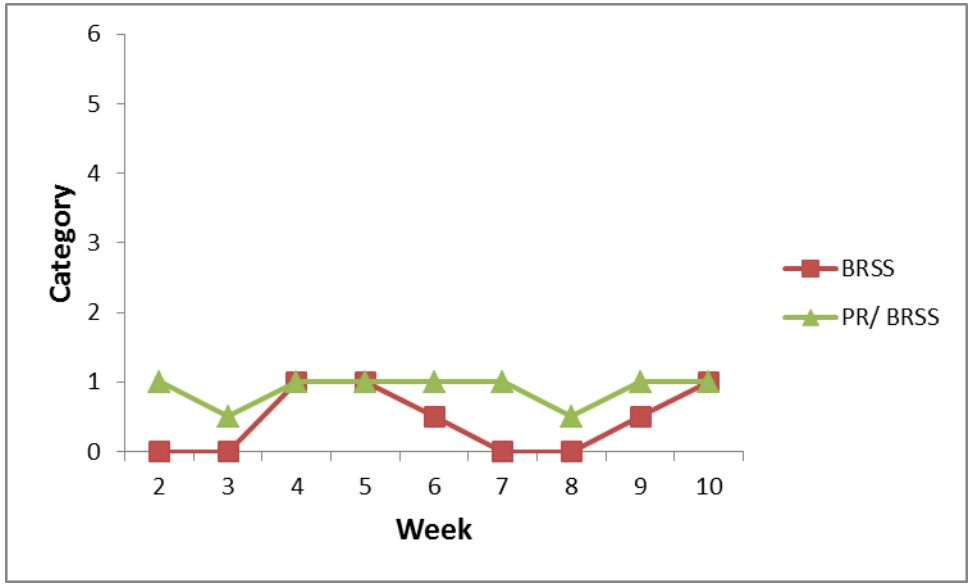

Figure 5. Self-reported amount of time spent on homework during the week. Medians at each week are graphed. Category labels refer to the following: 0 = *Did not do homework*, 1 = *½ hour*, 2= *1 hour*, 3= *2 hours*, 4= *3-4 hours*, 5= *5-7 hours*, 6= *7+ hours*. Participant response numbers for the BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 8, 13, 13, 12, 12, 12, 12, 12, and 10, respectively. Participant response numbers for the PR/ BRSS program for Weeks 2, 3, 4, 5, 6, 7, 8, 9, and 10 were 10, 10, 6, 8, 10, 11, 8, 9, and 8, respectively. Week 1 is not included because it was not included in analyses.