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Examining the longer-term impact of a home-visiting intervention program on the school readiness skills of English language learners in kindergarten

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Abstract

Young English Language Learners (ELL) present with varied profiles in their language and literacy development with parental involvement promoting development. The Home Instruction for Parents and Preschool Youngsters Program (HIPPY) is a free home-visiting intervention designed to empower parents to be their child's first teacher. The current study examined the effectiveness of the HIPPY program on language, reading, and social/emotional skills of kindergarten aged ELLs. The HIPPY group was compared to an English as a first language group (EL1) and a control group of ELL students who did not participate in HIPPY (ESL). Participants were assessed at two time points, approximately eight months apart, to uncover differences in achievement across groups and over time. Students in the EL1 group preformed significantly better than the HIPPY and ESL groups on measures of English vocabulary at each time point. All the groups demonstrated improvement in scores from Time 1 to Time 2, however, the HIPPY group demonstrated the greatest improvement among the groups on narrative storytelling scores. Results are discussed in terms of the relationships between measures and the implications of the HIPPY program for promoting language development in young learners.

Key words: English language learners, kindergarten, early literacy skills

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Table of Contents

List of Tables

List of Figures

List of Appendices

Introduction

The language learning skills of children, who come from homes in which a language other than English is spoken, differ from children from middle-class, monolingual English-speaking homes (Hoff, 2013). On average, the former students have lower English language skills when they enter school (Brooks-Gunn, Rouse, & McLanahan, 2007; Hernandez, Denton, & Macartney, 2007). Kindergarten classrooms are becoming increasingly diverse with students representing a variety of linguistic and cultural backgrounds. For example, according to 2016 Canadian census data, almost 2.2 million children under the age of 15 in Canada were foreign born or had at least one foreign born parent which represents 37.5% of all Canadian children (Statistics Canada, 2016a). Over 75% of Canadian immigrant families report having a first language other than English or French and these languages vary based on the country of origin. The largest group of immigrants to Canada come from Asian countries where several different languages are spoken. This range of first languages can be a challenge for educators who must provide English or French instruction to children with a broad variety of linguistic and cultural experiences. In contrast, in the United States, Spanish is the dominant language of immigrants with 43% of immigrants speaking Spanish (Pew Research Center, 2019). The current study examined the school readiness skills in three groups of learners in kindergarten (ages 4 to 5 years) who were attending the same schools. The three groups consisted of 1) English language learners who had been identified as at-risk and as a result had participated in a school readiness program with their primary caregiver; 2) English language learners who had not participated in any specialized programs and had not been identified as being at-risk and 3) monolingual English-speaking peers who had not been identified as being at-risk but attended the same

schools as the other two groups. These children also were tested eight months later at Time 2, when the children were in senior kindergarten.

Definitions of Key Terms

Given the age of the participants, this paper focuses on **school readiness skills,** which are the skills, knowledge and attitudes necessary for children to possess when they first enter school in order to engage in, and benefit from, the early experiences that promote their success. These include literacy skills (reading, writing, oral communication) and social emotional skills (self-regulation, sharing, turn-taking). For a comprehensive list of definitions of key terms, see Appendix A.

Early Intervention Programs

Early intervention programs target students at school entry who may be at a developmental disadvantage with a well-known example of this type of program being Head Start Programs. Head Start programs prepare the most vulnerable children to succeed in school by delivering services to children in core areas of early learning, health and family well-being (Office of Head Start, 2019). These services are delivered to children primarily between the ages of three and four years old and include mainly center-based activities. Although originally designed to target high poverty children (Bergman, 1980), language minority children who also come from low socio-economic status (SES) backgrounds are becoming increasingly represented in Head Start Programs (Aikens, Knas, Malone, Tarullo & Harding, 2017). The Head Start program is the primary model of early intervention used in the United States. In Canada, Head Start programs are less common and there is a broad range of different models of early intervention programs, including home visiting programs, one of which is the focus of this research. Research has demonstrated that Head Start programs are effective in significantly

increasing the probability a child will meet age-appropriate expectations (Choi, Rouse, & Dahyung, 2018). Further, Deming (2009) compared siblings and found that those who attended Head Start showed stronger academic performance for years afterward. Head Start is associated with significant gains in test scores of high-risk children on measures of math, literacy and science (Office of Head Start, 2019). Head Start is mainly centre based which makes it difficult to determine the extent of home support that is provided after the student leaves the centre and is no longer part of the intervention. Early intervention is important for students who may be at-risk for not developing the cognitive, linguistic and emotional skills needed at school entry and the present study will examine a model of early intervention that includes weekly home visits.

Research findings vary regarding the language trajectories of English Language Learners (ELLs) and the benefits and challenges of having a second language, which means there is a need for intervention programs that support these students and their families before school entry. While there are many types of intervention programs for children, sustained programs designed to improve children's school adjustment and prevent later academic problems are most effective when they occur during the preschool years or at school entry (Hanson, Morrow & Bandstra, 2006). One delivery method for early intervention programs is through home visits, which provides suggestions to parents regarding ways of enhancing their children's home experiences. Home visiting programs empower parents to teach their children important cognitive skills such as communication, reading, writing, math and problem-solving skills. Children benefit from cognitively stimulating home environments where these cognitive skills are developed with caregiver support (Gottfried, 2013). Home visiting programs also aim to improve a family's access to resources, meet basic needs, and strengthen family wellbeing (Brown & Johnson, 2013). This can be especially beneficial to families who may have limited resources due to low

SES or families who have limited English. By working intensively with families, these programs can help to prepare children for successful entry to Kindergarten.

Ecological Systems Theory explains how human development is influenced by different types of environmental systems (Bronfenbrenner, 1979). Bronfenbrenner's original work describes how early child development depends not only on individual growth and behaviour, but also on the child's family, community, school and political system, which can be referred to as their ecology. When considering early intervention programs in the context of Ecological Systems Theory, it is important to explore the relationship between the child and their environment, which is why early intervention programs should also focus on the systems, such as family interactions and community supports, in addition to the individual child's development.

The HIPPY Program

The Home Instruction for Parents of Preschool Youngsters program (HIPPY) was developed in Israel in the 1960s. The curriculum and program model were developed to teach mothers how to work with their children in order to prepare them for school. The first HIPPY families were immigrants with lower levels of education and income than the general population in Israel. Many children of immigrants in Israel fell behind in school achievement and HIPPY was implemented to help this group of children enter school better prepared. HIPPY became a national early childhood program in 1975. HIPPY was brought to the United States in 1984. As of 2003, HIPPY had expanded to Australia, Germany, New Zealand and Canada. HIPPY in Canada is offered as a three-year program. Children can enroll in one year, two years or all three years of the program. There is a 30-week program for three-year old children, 30-week program for four-year old children and 15-week program for five-year old children. HIPPY is designed for three to five-year old children because it addresses the importance of the parental role in a

child's transition from preschool to kindergarten. HIPPY is designed to build cognitive and emotional school readiness skills, which is consistent with the purpose of other early intervention programs, including Head Start.

HIPPY has a strong focus on enhancing parental involvement in their child's education. HIPPY home visitors work with families in their homes to support parents, primarily mothers, in their critical role as their child's first and in many cases most important teacher (Mothers Matter Care Centre, 2018). The 30-week HIPPY program is based on popular children's books. It involves weekly home visits with a trained home visitor. In addition to serving as an early education program, HIPPY incorporates other features of successful family support programs. These features include having the HIPPY parents meet on a monthly basis in a group setting in order to develop parenting skills and build support networks. Parents also have the opportunity to listen to guest speakers who discuss common needs and interests of the families. During these meetings, the youngest children participate in a preschool group where they learn social skills such as turn taking and sharing.

A positive characteristic of HIPPY is its highly structured format (See HIPPY Canada). This format includes providing parents with a set of lesson plans designed to enhance a child's whole development including language, fine motor skills and social-emotional skills. The HIPPY curriculum consists of nine storybooks, weekly activity packages, and basic supplies such as geometric shapes, scissors and crayons for each year in the program. Activity packages are set out as easy-to-follow lesson plans for parents, providing them with developmentally appropriate activities for their children with the objective of ensuring a successful and enjoyable learning experience. The major emphasis of the HIPPY curriculum is on students' cognitive skills (Westheimer, 2003). Each lesson is designed to build these cognitive school readiness skills such

as language development, perceptual and sensory discrimination, logical thinking, and problem-solving. The skills and concepts are introduced progressively to the parent and child, first using the physical body, then concrete objects. Finally, the representation of new objects is presented in pictures, followed by opportunities for the child to practice and learn new skills (Mothers Matter Care Center, 2018).

The HIPPY program employs mothers, who previously participated in the HIPPY program, as home visitors. This is often the first source of employment for the mother in Canada and is a potentially important source of Canadian work experience. The home visitors reach out to mothers with children who are three, four or five years old who experience barriers such as poverty, social isolation or language minority status. Home visitors receive intensive training on the curriculum to ensure consistency in program implementation. Through participation in the 30-week HIPPY curriculum, caregivers work with their child 15 to 20 minutes per day. Further, the monthly group meetings support the caregiver's social integration and help establish their support networks (Mothers Matter Care Center, 2018). Research supports the association between early literacy development and family social interactions, especially among low-income families (Dunst, Boyd, Trivette, & Hamby, 2002). Family routines have been linked to better self-regulation, fewer problem behaviors, and stronger health and cognitive outcomes for children (Rijlaarsdam et al., 2015). Aikens, et al., (2017) examined indicators of joint book reading frequency, home learning activities, and family routines on child outcomes. Using information from the Head Start Family and Child Experiences (FACES) dataset, they found that many parents of ELLs report reading to their child at least three times a week and report participating in learning activities in the home with their child. However, the data demonstrates that parents of ELLs are less likely to engage in a number of learning activities with children

than parents of non-ELLs, including book reading (Aikens et al, 2017). Further, three quarters of the ELLs included in this data set lived at or below the poverty threshold (Aikens et al, 2017).

Research has examined the impact of HIPPY on parent and child outcomes. Most of this research has been conducted outside of Canada. HIPPY has demonstrated positive outcomes for children of teenage mothers. In five urban Texas school districts, kindergarten teachers completed a Kindergarten Readiness Survey for HIPPY graduates, which examined five dimensions of school readiness including social-emotional development, approaches to learning, physical development, language development, and general knowledge (Brown & Johnson, 2013). Adolescent mothers who participated in HIPPY had children who performed equally when compared to children of traditional-aged mothers who participated in HIPPY (Brown & Johnson, 2013). A study conducted in Australia found that teachers reported HIPPY parents having more contact with the school and the parents were significantly more likely to be involved in their child's learning and development than the comparison group of parents (Barnett, Roost, & McEachran, 2012). While parental school involvement is positively related to school achievement (Henderson & Mapp, 2002), minority parents and parents who have limited English proficiency tend to be less involved in their child's schooling (Nistler & Maiers, 1999).

HIPPY program participation also has been associated with more enriched home learning environments. In a quasi-experimental study of HIPPY's impact on home learning environments, participation was the best predictor of positive ratings of the home environment after controlling for income, perceived efficacy, stress, depression and maternal education (Nievar, Jacobson, Chen, Johnson & Dier, 2011). Families in HIPPY had more learning materials in the home, provided a greater variety of learning experiences, and encouraged more types of pre-academic activities in their homes (Nievar et al., 2011).

Research has examined the effectiveness of blending the support models of Head Start and HIPPY (Brown, 2019). Head Start and HIPPY share the common goals of preparing children for kindergarten and closing the achievement gaps for students who may be at risk of cognitive or developmental delay. The programs are similar in that they both focus on building early literacy skills in young children. However, Head Start is a center-based program whereas HIPPY is a home visiting program. The goal of collaboration between the two programs is to improve family engagement through implementing home visits in addition to supporting at-risk children in the classroom setting. Results of the thematic analysis from interviews with parents, teachers, administrators and home visitors demonstrated that more families have access to services when the programs are combined and the communication between all parties improved (Brown, 2019).

Although research outside of Canada has demonstrated the benefits of HIPPY, and other Head Start programs, for Spanish Dual Language Learners and their families (Nievar et al., 2011), there is limited research on the effects of the HIPPY program on our young linguistically diverse students in Canada. HIPPY is relatively new in Canada, compared to the program's longer history in the United States, where Spanish is the dominant language of immigrants. Further, due to the increase in immigration in Canada and the variety of languages represented, Canadian classrooms are changing and the need for programs that address the learning needs of ELLs is increasing. If the outcomes of research on the effectiveness of this program are positive, the results will provide feedback for the HIPPY coordinators in order to improve programming and have the potential to increase access for families. Further, outcomes of the research can give insight into the effects of HIPPY in Canada where the diversity of languages is more widespread than in the United States.

Language Development in ELLs

Recent developmental research has demonstrated cognitive benefits for children who can communicate in more than one language (Barac, Bialystok, Castro, & Sanchez, 2014; Bialystok, 2001; Choi, Jeon, & Lippard, 2018). However, children's status of using a language other than English as their primary home language also can be considered a risk indicator for the development of English language skills in children at school entry (August, Shanahan & Escamilla, 2009). Halle and colleagues (2012) found that ELLs who entered kindergarten with English proficiency demonstrated achievement in math and reading that was comparable or better than their English monolingual peers, during the period between kindergarten and eighth grade. Those who entered kindergarten with limited English proficiency presented poorer academic performance and growth, with the worst outcomes evidenced for children who did not achieve English proficiency by first grade (Halle et al, 2012).

Rodge, Melby-Lervag and Lervag, (2016) examined the efficacy of a program designed to improve the general second language skills of kindergarten students. There is a strong link between second language vocabulary and second language reading comprehension (Lervag & Aukrust, 2010) which indicates programming that targets vocabulary in the language of instruction for second-language learners should be an effective way to enhance second language learners' language skills and improve reading comprehension (Rodge et al., 2016). The program, which included students being explicitly taught English vocabulary, had a positive effect on vocabulary scores, and these effects also generalized to expressive language skills (Rodge et al., 2016).

Research has focused on the varied language trajectories of students entering kindergarten who come from homes where a language other than English is predominant. Preschool children who are acquiring two languages tend to have lower levels of skills in each

language than do monolingual children (Thordardottir, Rothenberg, Rivard, & Naves, 2006). These differences are significant even when matched for SES (Hoff, 2013). Differences were significant in both vocabulary and grammatical development. However, these studies have also shown that bilingual children actually equal or exceed monolingual children in their rates of vocabulary development when both languages are considered together (Hoff, 2013; Thordardottir et al., 2006). Further, research has demonstrated that bilingual children outperform monolingual children on selective attention tasks and that bilinguals demonstrate better executive function advantages over their monolingual counterparts even when matched for SES and controlling for general intelligence (Blom, Boerma, Bosma, Cornips & Everaert, 2017; Bialystok, Craik & Luk, 2012). In addition to the positive benefits of bilingualism discussed in above research, it is important to acknowledge that some research studies argue that these bilingual advantages may be trivial in their magnitude or limited to very specific cases (Papp, Schwieter & Paradis, 2019). There may be methodological differences in studies, such as the use of non-standardized tests and ignoring individual differences, that make the results of studies on the bilingual advantage lack generalizability (Van Den Noort et. al., 2019).

Contributors to Language Acquisition and School Readiness Skills

Teacher Perceptions and Behaviours

Most students in Canada spend six hours per day, five days per week, in their Kindergarten classrooms. It is essential to discuss the impact early education teachers have on student language development and well-being. Early intervention programs help to build English proficiency in students; however, it is important to continue to foster an appreciation for a child's individual culture and home language in the classroom. Research shows that teachers who demonstrate cultural confidence, and allow students to use their home language, contribute to

student success (Baker, 2019). Specifically, teachers' perceptions of culture and children's linguistic competency play a role in the way education is provided to ELL children (McSwain, 2001). For example, teachers may or may not encourage their students to speak their home languages in the classroom based on preconceived perceptions and beliefs (Pettit, 2011). Teachers who have a greater appreciation and respect of culture provide a more nurturing environment in which students are encouraged to learn English while fostering the development of their home language (Baker, 2019).

Importance of Maintaining Home Language

Students who enter an English language school in Ontario, with a primary home language other than English, are encouraged to read, write and speak in English at school. However, unless parents and teachers actively encourage maintenance of the home language, the child is in danger of losing their first language and subsequently the benefits of bilingualism (Wong-Fillmore, 1991). The child's home language is critical to their cultural identity. It allows the child to continue to communicate with family members, especially those who may not speak English. This helps the child to value their own culture and contributes to positive self-concept (Wong-Fillmore, 1991). Further, students who learn English and continue to develop their first language at home have higher achievement in the later years than children who learn English at the expense of their home language (Collier, 1995). When students who are not yet fluent in English, switch to using only English, they are functioning at an intellectual level below their age (Collier, 1995). Encouraging and supporting young children speaking their first language in the Kindergarten classroom allows the children to foster an appreciation for bilingualism and helps maintain intellectual development levels. If there are students in the class who speak the same first language, they can have conversations with each other in that language. Also, having dual

language books available in multiple languages and having volunteers come into the classroom to read them is another way of promoting first language development in a classroom. Opportunities to develop and maintain first language proficiency are available within many Ontario school boards, free of charge for families. These opportunities include evening and weekend international and indigenous language classes offered in many different languages which encourages and promotes bilingual development for students. HIPPY home visitors speak a variety of first languages which allows them to reinforce learning concepts with the families in their home language to ensure understanding and promote bilingual development of the child.

Early Literacy and School Readiness Skills

Early literacy skills have a strong and clear relationship with later developing literacy skills. However, some early literacy skills appear to be more important than others. "The strongest and most consistent predictors of later literacy development are alphabet knowledge, phonological awareness and memory, rapid automatized naming of letters and objects, and writing letters" (National Institute for Literacy, 2009, p.5). These early skills are found to have an impact on the later development of literacy skills such as decoding, oral reading fluency, reading comprehension, writing and spelling (National Institute for Literacy, 2009).

Vocabulary

Vocabulary consists of the words that make up a particular language. Vocabulary knowledge is considered a component for effective, evidence-based reading instruction (Ouellette, 2006). Vocabulary plays a fundamental role in the reading process and is an important precursor to reading comprehension. Students who hear more words at home enter school with larger and more diverse vocabularies (Hart & Risely, 1995) and vocabulary is a strong indicator of student success in the early years and beyond (Baker, Simmons & Kame'enui,

1997). Oral vocabulary, in particular, is positively associated with reading outcomes and is a strong predictor of reading outcomes for monolingual children (Storch & Whitehurst, 2002). Students who are ELLs are acquiring two sets of vocabulary repertoires which distributes their vocabulary knowledge across languages. Therefore, ELLs will initially have smaller vocabularies in a given language than monolingual speakers of that language, matched for SES (Conboy & Thal, 2006; Oller, Pearson & Cobo-Lewis, 2007).

Phonological Awareness

Phonological awareness involves being able to recognize and manipulate the units of sound that make up a language. This skill is highly related to word reading acquisition and differentiates good and poor readers who are monolinguals and bilinguals (Anthony & Lonigan, 2004). ELLs may initially have difficulty with phonological awareness because they may not have enough experience with English to differentiate the sounds from those in their native language (Anthony, Solari, Williams, Schoger & Zhang, 2009). This would differ based on the native language of the ELL and the sounds in these languages can vary greatly. One example would be the differences between Arabic and English. Arabic has six individual phonemes that are not in the English language. Further, English has about three times as many vowel sounds as Arabic, so ELLs will initially have trouble distinguishing between some of the words they hear (Alja'arat & Hasan, 2017). ELLs will not be able to develop phonological awareness in English until they are familiar enough with the sounds of English. However, understanding the development of phonological awareness in ELLs is challenging because both language systems are implicated (Bialystok, Luk & Kwan, 2005). Phonological awareness is a precursor to reading, and the HIPPY program is designed to include the direct teaching of phonological awareness skills such as onset-rhyme identification, and letter-sound correspondence as well as

other skills related to learning to read. According to Anthony and Lonigan (2004), phonological awareness plays a critical role in acquiring early literacy skills. “When acquiring emergent literacy skills, ELLs bring an additional set of resources that are linked to their first language including knowledge of a first language’s phonology, morphology, syntax, semantics and orthography, if literate.” (Anthony et al., 2009, p.539). Therefore, understanding the developmental pathways of cross-linguistic relations between a child’s first and second language is important when designing programs to support young ELLs emergent literacy development, including phonological awareness skills. Further, these cross-linguistic relations in emergent literacy skills are also important when recognizing “at-risk status for later reading difficulties in young ELLs” (Anthony et al., 2009, p539).

Concepts of Print

Early in the literacy learning process children must learn the important concepts of print and how they relate to book handling skills, text directionality, spacing and function of letters/punctuation. They must understand that print can be used to communicate information. This knowledge of the concept of print provides a foundation for the development of reading skills (Clay, 2001). Children move from knowledge about the concepts of print and letter-sound correspondences, towards using that knowledge, combined with phonological awareness skills, to read words. Further, when children have a concept of print, they can better participate in shared reading activities.

Shared reading involves children listening to a book read aloud by a caregiver or educator. It could also involve the child reading the book along with the parent or educator. When reading along with a parent or educator, the child is directed to pay attention to the important concepts of print such as directionality, spacing, and punctuation. When caregivers

read books aloud to their children from an early age, this also offers an advantage for the child's vocabulary development. The child hears more spoken words and therefore has a broader range of possible word choices to use and understand (Merga, 2019). In the very early years spoken vocabulary has been linked to reading comprehension skills and related word recognition skills (Lonigan & Whitehurst, 1998). Lonigan and Whitehurst (1998) examined the impact of an early shared reading intervention on children from low SES backgrounds. When parents and teachers were trained in a specific form of interactive shared reading with their children, significant effects of the reading intervention were obtained and were largest for the children involved in reading at home with a parent. Wells (1985) demonstrated that the more frequently children between the ages of one and three listen to stories at home, the higher teachers rate their oral language skills at age five and reading comprehension skills at age seven. The shared read aloud model of the HIPPY program, which uses popular children's books, helps to build early vocabulary skills of young ELLs enrolled in the program. Further, research demonstrates that ELLs tend to lag behind their monolingual peers on standardized measures of English oral language development (Hoff, 2013). Language samples obtained from a narrative task can be analyzed for a range of language sub-skills which means they constitute a comprehensive measure of a young child's English oral language abilities (Paradis & Kirova, 2014). Therefore, examining the differences in oral narratives between ELLs who have been through the HIPPY program, compared to their ELL and EL1 peers, will provide interesting comparisons.

Social/Emotional well-being

Social/emotional well-being at school involves a child's ability to manage their emotions in a productive way so they can participate in classroom activities. A child's emotional well-being in the early years has a positive impact on their relationships with peers and adults

(Trawack-Smith, 2014). Social/emotional development in the preschool years involves taking turns, becoming independent in following routines, interacting positively with peers and controlling emotions. These skills are essential for successful participation in school experiences and for overall social/emotional development. Recently, studies have looked at the role of self-regulation skills on children's school readiness and academic outcomes (Eisenberg, Valiente & Eggum, 2011). Self-regulation involves a child being able to manage regulatory and emotion-related processes that can be willfully controlled (Eisenberg et al., 2011). Through an intensive review of research on the relationship between self-regulation and school success, Eisenberg et al. (2011) determined that a child's ability to control their emotions is critical for the child's quality of behaviour at school and their relationships with teachers and peers. Further, "children's emotions can also be regulated by external factors such as parents' behaviours" (Eisenberg et al., 2011, p.682). Therefore, although self-regulation skills are also a result of individual temperament (Eisenberg et al., 2011), promoting parent/child relationships through a positive early learning environment in the home, should help a child better self-regulate when they attend school.

Parental Involvement

Research suggests that parents can have a positive impact on their child's learning by being involved in the child's school (Henderson & Mapp, 2002). Parental involvement can have many forms including physical involvement and personal involvement. Physical involvement includes activities such as volunteering in the classroom or attending field trips. Personal involvement includes feeling welcome in the school community, feeling comfortable asking questions of the child's teacher and positively communicating with their child about school matters. Examining the impact of the HIPPY program on the personal involvement of parents

from linguistically diverse backgrounds is an important discussion point. Research demonstrates that school involvement of minority parents and parents from low SES backgrounds has more impact than involvement of parents from the ethnic/cultural majority (Graves & Wright, 2011).

Purpose of the current research

Considering the importance of early language development and school readiness skills, the current research study focuses on school readiness skills in students who have participated in the HIPPY program and attend Kindergarten in Ontario, Canada. Research on the impacts of the HIPPY program is limited in Canada and it is important to determine how this program is benefiting our young, linguistically diverse children at school entry. This research will help to determine the benefits of the program as they relate to the important language and social/emotional development skills discussed above.

The school board that was selected for this study has been providing the HIPPY program for 13 years. It is a school board in a fast-growing municipality in Ontario with the community experiencing a growth rate of 30.5% from 2011 to 2016 (Statistics Canada, 2016b). According to 2016 Census data, 39.4% of families in the school board selected report a language other than English as the first language spoken in the home. These trends reflect similar levels of growth and demographic changes in other middle-sized cities across Canada that have not traditionally been associated with large groups of second language (L2) speakers. HIPPY was selected by this particular school board because of its focus on both school readiness skills and parental involvement. HIPPY also provides employment for mothers who were previously participants in the program themselves, which helps to strengthen their role in the community and gain employment experience in Canada. As kindergarten classrooms are becoming increasingly linguistically diverse, it is important to consider how the school readiness skills of students

compare between ELLs who have participated in HIPPY, ELLs who have not participated in HIPPY and students who speak English only and have not participated in HIPPY.

Research Questions and Hypotheses

The current study focuses on three research questions, using a longitudinal design to examine similarities and differences across three groups.

Research Question 1: The first research question (RQ1) addresses what impact the HIPPY program has on kindergarten student's school readiness skills at Time 1 (early literacy, vocabulary, narrative storytelling and social/emotional skills). It is hypothesized that strengthening these skills in ELLs, through participation in the HIPPY program, will have a positive impact on English vocabulary development, phonological awareness, narrative storytelling and social/emotional skills.

Research Question 2: Second (RQ2), how do students who have participated in HIPPY progress in the kindergarten program as compared to their age matched peers from Time 1 and Time 2? It is further hypothesized that immediate effects of participation in the HIPPY program will positively impact the participant's language and literacy development. Further, it is important to look at whether the skills are maintained over time. When it comes to literacy skills, it is expected that the children in the HIPPY group will both maintain and develop skills at a similar rate to age matched peers who did not participate in the HIPPY program.

Research Question 3: The third research question (RQ3) examines Time 1 measures as predictors of Time 2 measures. Do scores on measures of early literacy skills at Time 1 predict scores on the same measures at Time 2? It is hypothesized that scores on Time 1 language-based measures will be related to each other at Time 1 and will predict Time 2 scores. Further, relationships between variables will be examined across time.

It is important to note that the lead researcher on this project is a teacher with the school board that participated in this study and was involved with the data collection. However, the researcher does not directly work with the HIPPY program or any of the families involved in the research study. Full ethics approval was obtained by the lead researcher from both Wilfrid Laurier University and the school board, prior to commencing the project.

Method

Participants

The participants were 63 junior kindergarten students living in a medium-sized city in Ontario, Canada. The children belonged to one of three groups based on their language learning backgrounds and their participation in the HIPPY program. Informed consent from the parents of 17 students in the HIPPY program was obtained. Further, parental consent forms were sent home with 200 students in Junior Kindergarten at three large schools in the participating school board. Only 46 out of the 200 were returned and all returned consent forms gave consent for participation. Parents were asked to indicate on the consent form whether their child speaks English only or English and another language. From those consent forms, 26 students who speak English only (EL1) and 20 students who speak English and an additional language (ESL) consented to participate in the study. Consent was obtained from the principals of each school where the participants attended, and teacher consent was obtained from the classroom teachers of participating students. Participants included 30 females and 33 males who are all between the ages of four and five years old and enrolled in Junior Kindergarten. Participation was lower at Time 2 due to movement of students outside of the school board. At Time 2, participants included 21 students in the EL1 group, 14 students in the ESL group, and 17 students in the HIPPY group. As an appreciation for participation in this study, each participating classroom

was provided with two dual-language story books to help young students see various home languages represented in their classroom.

EL1 participants

At Time 1, the EL1 groups consisted of eight females and 18 males (M_{age} = 4.37). All consent forms for students in the EL1 indicated that English is the child's only language.

ESL participants

At Time 1, the ESL group consisted of 12 females and eight males (M_{age} = 4.30). Home languages of the ESL group included; Urdu (n=9), Arabic (n=3), Hindi (n=1), Vietnamese (n=1), Punjabi (n=1), Gujarati (n=1), Tamil (n=1), and Pashto (n=1). Two of the participants in the ESL group did not report which language is spoken at home, just that they speak another language.

HIPPY participants

At Time 1, the HIPPY group consisted of 10 female and seven male participants (M_{age} = 4.51). Students in the HIPPY group had all completed the 30 week 4-year old HIPPY program prior to Time 1. Home languages in the HIPPY group included; Urdu (n=12), Arabic(n=1), Malayalam (n=2), Turkish(n=1), and Portuguese (n=1).

School Context

Students were recruited from schools that serve many language minority students. Each of the large schools had a population of over 900 students with 50% or more of the students identified as ELLs based on the information on their registration forms. Instruction was conducted in English in all the classrooms and students in this study were all enrolled in the Ontario Full Day Kindergarten program. Classrooms were comprised of a blend of junior kindergarten and senior kindergarten students between the ages of three and six years old.

Procedure

The children were all tested individually, outside of their classrooms, during May or June of their junior kindergarten year. The children were tested by the primary researcher and trained research assistants in English. The series of standardized and experimental tasks were administered to children over two sessions. Each session was approximately 20 minutes long. Session one included tests of picture vocabulary, word reading and phonological awareness. The second session included two tasks; an audio recording of the student telling a narrative story using a wordless picture book and naming animals in both English and their home language from pictures. The ESL and HIPPY participants were unable to name the animal pictures in their home language with the English-speaking researcher and therefore this task was only administered at Time 1. Children are used to speaking in English to their teachers throughout the school day. When the children were asked, in English, to name the animals in their L1, many children began to name the animals in English. It is possible that due to the young age of the children, they did not understand what the researcher was asking. It may have been more successful if the researcher was able to administer the measure in the L1 of the child, but due to the large variety of languages, it was not possible to recruit testers fluent in all the languages. The remaining tasks were repeated at a second time point, approximately 30 weeks after the first time point, with the exception of the animal naming task.

Measures

Demographic information

A brief demographic survey was sent home with students in the HIPPY and ESL groups at Time 1 to determine first language use at home by the child and parents. The survey asked parents to indicate how often their child speaks in their L1 and English to parents and siblings

(e.g., never, rarely, sometimes, frequently, always). The survey also asked parents to indicate their own comfort level with speaking, reading and writing their L1 and English on a scale from one (not at all fluent) to ten (very fluent). Parents were also asked to identify their highest level of education with a range of choices from elementary school to a graduate level degree.

Children's academic skills

Vocabulary English vocabulary knowledge was measured using the Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007). The PPVT consists of 228 items grouped into 19 sets of 12 items each, arranged in order of decreasing frequency, with increasing difficulty being assumed. An item consists of four full colour pictures. The children were asked to select a picture from each item that best matches the spoken word presented by the researcher (e.g., put your finger on; reading, mouth). The items include verbs, adjectives, and nouns. The words belong to one of 20 different content categories such as animals, actions or emotions. According to the guidelines in the manual, the initial set of items administered is dependent on the age of the participant. For this research, at Time 1, every participant started at the first set of items for age 2:6 and continued until he or she made eight errors in one of the sets. At Time 2, all participants started with the age 4 items and continued until he or she made eight errors in one of the sets. Both split-half and test-retest reliability for the PPVT-4 are high, with coefficients greater than α=.90 for four- and five-year old children (Dunn and Dunn, 2007). A raw score was computed for each participant and used for analyses. The suitability of the PPVT-4 for use with ethnically, linguistically or culturally diverse populations is debated, as it was developed to measure standard American English (Dunn & Dunn, 2007; Zhu & Gonzales, 2017). Studies have shown that ethnically and linguistically diverse populations tend to score one to two standard deviations below normative expectations (Washington and Craig, 1992; Champion et al., 2003).

English and L1 baseline vocabulary were also assessed using a printout of animal pictures (see Appendix A). First, children were asked to name any of the animals they can identify in their L1. They are also asked to name the animals in English. This task was attempted at the first time point and none of the children produced any animal names in their L1 at Time 1 despite the majority of items being high frequency words. Therefore, the task was not repeated at Time 2.

Word Reading Alphabet knowledge and early word reading were measured using the Letter-Word Identification subtest from the Woodcock Johnson Test of Cognitive Abilities (WJIV, Woodcock & Johnson, 2014). Children were asked to choose the correct letter as indicated by the researcher (e.g., point to the letter A). The children also needed to verbally name a series of letters (H, C, A, S, B, W) and identify a word named by the researcher from an array of four words (e.g., point to the word 'see'). Then, children were asked to read a series of early sight words as presented by the researcher (e.g., is, and, go, will, not, but, from, had). The children were asked to continue reading letters and words until they made six consecutive errors. A raw score for this subtest was calculated for each participant and used for analysis. Reliability coefficients for the letter-word identification WJIV exceed α=.90 for all age groups.

Phonological Awareness Phonological awareness was measured using the sound matching section of the Comprehensive Test of Phonological Processing (CTOPP), first edition (Wagner, Torgeson, Rashotte, & Pearson, 1999). The children were asked to match pictures that share the same first sound as the target picture (e.g., which picture starts with the same sound as 'man', 'mouse, car, or hat'). There are 10 items for first sounds. If the student was successful in matching at least 6 pictures with their corresponding first sound, they were asked to match pictures with the same last sound, on a similar task (e.g., which picture ends with the same sound

as ‘cap’, ‘car’, ‘lip’ or ‘fan’). The last sound items are also scored as number correct out of 10 items. This standardized measure is designed for children between the ages of four and six years old and reliability coefficients for the sound matching subtest exceed α=.80. The participant’s raw score out of 20 was used for analyses.

Narrative Story Telling. Narrative storytelling was measured using the Frog Story wordless picture books (Mayer, 1969). The researcher began by telling the child a scripted story using the wordless picture book “Frog Where Are You” (SALT software, 2017). After the child listened to the researcher tell the story, he or she was given the book and asked to tell his or her own story using the pictures on the pages. The children were audio recorded and transcribed by two trained research assistants. Each transcribed narrative was then coded for the inclusion of specific episodes (e.g., boy and frog, frog escapes, looking for frog) to obtain a score out of 14. At the second time point, the wordless picture book titled “One Frog Too Many” (Mayer, 1975) was used and coded in a similar manner to obtain a score out of 18. The Frog Story wordless picture books have been shown to be a valid method of eliciting detailed narrative language samples from participants of various linguistic and cultural backgrounds (Berman and Slobin, 1994). The two research assistants discussed the process for their transcriptions in detail to ensure consistency. The narratives were scored using a series of specific episodes, which were determined by the project supervisor and one of the research assistants, prior to assessing the transcriptions (see Figure 2 and Figure 3). Two research assistants coded the first 4 participants in each group at Time 1 and inter-rater reliability was calculated to be κ = .83. For Time 2 narratives, the author, and the research assistant who participated in the coding, each independently coded the first two participants in each group and the final two participants in

each group. Inter-rater reliability was assessed to be $\kappa = .92$. The author and research assistants discussed the coding scheme in detail prior to independently coding.

Social/Emotional Skills. The Strengths and Difficulties Questionnaire (SDQ) for Teachers was completed at Time 1 for students in all three groups by their teacher (SDQ: Goodman, 2001). The SDQ is comprised of 25 statements which are scored on a three-point scale (not true, somewhat true, or certainly true). The questionnaire yields five subscales including measures of emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour (five items each). The first four subscales generate a difficulties score, and the last subscale, a prosocial score. Reported reliability for the subscales are α=.80 or greater for the difficulties subscales and α=.73 overall (Goodman, 2001). All participating teachers provided signed consent to complete the SDQ.

Analysis Plan

Data were analyzed using IBM SPSS Statistics (version 25). Relationships were examined between all measures of interest by conducting Pearson correlations between measures at Time 1, and across time points. To compare groups on measures of early literacy and social/emotional skills (RQ1), a series of one-way, between groups ANOVAs was completed based on the results of the Levene's test. Post-hoc tests using the Dunnett and Tukey HSD were conducted to uncover the nature of any differences.

To compare group scores across time points (RQ2), a mixed model ANOVA was conducted for each measure with group as the between-subjects factor and time as the within-subject factor.

Further, regressions analyses were conducted to explore significant predictors of Time 2 scores using Time 1 variables as predictors (RQ3).

G*Power software was used to calculate the minimum sample size required for a power of $a = 0.95$ which identified a minimum sample size of N = 33 (n = 11 per group). Although the sample seemed sufficient, it is important to view the findings as exploratory.

Results

Demographic Information

Nine surveys from the HIPPY group and six surveys from the ESL group were returned. Due to the inability to obtain the survey information from many of the parents, the information collected was used for descriptive purposes only. In the HIPPY group, when asked how often their child speaks in the main home language to parents and siblings; three families indicated that their child rarely or never speaks in the main home language, two families indicated that their child sometimes speaks in the main home language and four families indicated their child always speaks in the main home language. The highest degree of education reported by one parent in the HIPPY group is graduate level degree. Even families with higher education may still be considered at-risk if they are new to Canada and are not employed. Of the surveys returned, only one child in the HIPPY group was born outside of Canada, but that student had only attended school in Canada. In the ESL group, when asked how often their child speaks in the main home language to parents and siblings; one family indicated that their child rarely or never speaks in the main home language, one family indicated that their child sometimes speaks in the main home language and four families indicated their child always speaks in the main home language. The highest reported level of parental education in the ESL group was also one parent with a graduate level degree. All of the surveys in the ESL group indicated that the children were born in Canada.

Descriptive statistics

Mean scores with standard deviations were calculated for each group on each measure (see Table 1). Variability is somewhat different across groups with higher variability and lower means in the HIPPY and ESL groups, particularly with scores on the PPVT4, which is consistent with research (Zhu & Gonzales, 2017). The ESL group demonstrated the lowest mean scores on all measures, with the exception of narrative storytelling at Time 2. Visible inspection of mean scores suggest improvement for each group across time points on measures of vocabulary, phonological awareness and word reading. However, mean scores were slightly lower for the EL1 group on Time 2 narratives compared to their scores at Time 1[1]. Floor and ceiling effects in data analysis can lead to biased estimates, which make it important to closely examine the distribution of scores in standardized measures, particularly when administrated to diverse populations (Zhu & Gonzales, 2017). Looking at the distribution of scores for each group, there is no evidence of floor or ceiling effects on academic measures, however there were scores of zero on the teacher reported social/emotional strengths for participants in both the ESL (n=1) and HIPPY (n=1) groups. The Woodcock Johnson IV allows for the calculation of age and grade equivalent scores. These age and grade equivalencies can be used to help with the understanding of scores. A score between 6 to 10 correct on the Letter-Word identification section of the Woodcock Johnson would translate to an age equivalency of 4 years, 10 months to 5 years, 6 months, which is the age of the participants in this study. The letter identification items are from item 1 through 14, and the word identification items start at 14. Therefore, a score of 0 on the word identification items would be considered age appropriate for kindergarten students. Only 25 out of 63 participants scored higher than 14 at Time 1 on the Woodcock Johnson IV, whereas

[1] Statistical differences will be examined in later sections.

at Time 2, the lowest recorded score on the Woodcock Johnson is a score of 12 (n=2), with 46 out of 52 participants achieving a score of 14 or greater correct. Overall the means for each group in this study fall within age and grade appropriate equivalencies for kindergarten students on measures of letter-word identification. A score greater than 17 correct on this subtest is associated with an age equivalency of 6-years old, first grade equivalency.

Research Question 1

What is the impact of the HIPPY program on Kindergarten student's school readiness skills (early literacy, vocabulary, narrative story- telling and social/emotional skills)?

To address the first research question, scores from Time 1 on measures of vocabulary, word-reading, phonological awareness, social-emotional skills and narrative story telling are compared using a between groups one-way ANOVA. Prior to analyzing the data, Levene's tests were completed to test the assumption of homogeneity of variance for each variable. Both the PPVT4 and CTOPP distributions violated this assumption. Since homogeneity of variance was violated, the adjusted Welch's F-value was used for the vocabulary measure. There were significant differences between groups on measures of vocabulary $F(2,37.12) = 7.63$, $p < .01$, $\eta_p = .24$. There were also significant differences between groups on measures of narrative storytelling $F(2,59) = 3.32$, $p < .05$. $\eta_p = .10$. Post hoc comparisons of vocabulary scores using the Games-Howell post hoc test indicate that the mean score for the EL1 group ($M = 74.15$) was significantly greater than the ESL group ($M = 60.55$, $p = .002$) and the HIPPY group ($M = 67.82$, $p = .044$). The ESL and HIPPY groups did not differ significantly on measures of vocabulary. Post hoc analyses using the Tukey HSD test of scores on narrative storytelling demonstrate significantly higher scores in the EL1 group ($M = 9.17$, $p < .05$) compared to the ESL group (*M*

= 7.26) and no significant differences between the HIPPY group (M = 7.94) and the EL1 and ESL groups.

Research Question 2

How do students who have participated in HIPPY progress in the kindergarten program as compared to their age matched peers?

To examine the effect of time, a 3 (condition) X 2 (time) mixed model design was used with condition (EL1, ESL and HIPPY) as the between-subjects factor and time of assessments (Time 1 and Time 2) being the within-subject factor. The dependent measures include scores for each group on measures of vocabulary, phonological awareness, word reading and narrative storytelling. There is a significant main effect of time on measures of vocabulary ($F(1,49)$ = 213.84, $p<.001$ $\eta_p^2 = .814$), phonological awareness ($F(1,49) = 99.96$, $p<.001$ $\eta_p^2 = .67$), and word reading ($F(1,49) = 76.84$, $p<.001$ $\eta_p^2 = .61$). However, there is no significant interaction between time and condition.

Interestingly, at Time 2, narrative storytelling scores are significantly higher in the HIPPY group compared to the EL1 group ($F(2,49) = 3.40$, $p < .05$). There is no significant difference in the Time 2 narrative scores between the ESL and EL1 groups or the HIPPY and ESL group.

Research Questions 3

Are Time 1 scores predictors of Time 2 scores on measures of vocabulary, word reading, and phonological awareness?

Relationships among variables within time

A series of Pearson correlation analyses were conducted to examine relationships among variables within and across time.

Cognitive Variables

There were significant moderate positive correlations between measures of vocabulary and phonological awareness ($r(61) = .30$, $p < .05$), and vocabulary and narrative story telling ($r(61) = .43$, $p < .01$). There were also significant moderate positive correlations between narrative storytelling and word reading ($r(61) = .33$, $p < .01$) and narrative story telling with phonological awareness ($r(61) = .32$, $p < .05$).

Social Emotional Variables

Further, there was a significant moderate negative correlation between social difficulties and vocabulary ($r(61) = -.28$, $p < .05$). Social strength and difficulty scores were only measured at Time 1 and there was a strong significant negative correlation between social strengths and social difficulties ($r(61) = -.70$, $p < .01$; see Table 2).

Relationships among variables across time

Cognitive Variables

Correlations across Time 1 and Time 2 demonstrated significant strong relationships between scores for measures of vocabulary ($r(50) = .68$, $p < .01$), word reading ($r(50) = .71$, $p < .01$), and phonological awareness ($r(50) = .52$, $p < .01$). Vocabulary scores at Time 1 were moderate and positively related to scores of phonological awareness at Time 2 ($r(50) = .33$, $p < .05$). Scores on measures of word reading at Time 1 were moderate and positively related to Time 2 scores of vocabulary ($r(50) = .44$, $p < .01$) and phonological awareness ($r(50) = .49$, $p < .01$). Phonological awareness scores at Time 1 were moderately related to scores on vocabulary ($r(50) = .45$, $p < .05$) and strongly related to word reading at Time 2 ($r(50) = .57$, $p < .01$). Narrative scores at Time 1 were moderate and positively related to vocabulary scores at Time 2 ($r(50) = .49$, $p < .01$; see Table 3).

Social/Emotional Variables

Further, measures of social difficulties at Time 1 demonstrated a moderate significant negative relationship with measures of vocabulary at Time 2 ($r(50) = -.37$, $p < .01$). Measures of social strengths at Time 1 demonstrated a significant moderate positive relationship with measures of vocabulary at Time 2 ($r(50) = .30$, $p < .05$).

Regression Analyses

To explore whether scores on measures of vocabulary, word reading, phonological awareness and narratives at Time 1 are significant predictors of Time 2 scores on the same measures, several hierarchical regression analyses were conducted and are presented in the next section. The following variables were used as predictors; Group, Time 1 vocabulary, Time 1 word reading, Time 1 phonological awareness, Time 1 narrative storytelling. The dependent measures were vocabulary, word reading, and phonological awareness (all at Time 2). Variables were selected based on whether they were significantly correlated with the Time 2 variable of interest as well as previous theoretical and empirical results, which also were used to determine the order of entry of the variables.

Vocabulary outcome

To assess the contribution of Time 1 variables on vocabulary scores at Time 2, the following Time 1 variables were entered in the regression analysis in this order: group, phonological awareness, word reading, narrative storytelling, vocabulary (see Table 4). The overall model was significant, $F(5,45) = 14.14$, $p < .001$, $R^2 = .57$. Time 1 vocabulary scores were the only variable uniquely related to Time 2 vocabulary scores, $\beta = 0.63$, $t(45) = 4.91$, $p < .001$, contributing 21% unique variance. Although group, word reading, phonological

awareness and narrative story telling were related to vocabulary when entered in previous steps, they failed to reach significance at step 5 (see Table 4).

Word Reading outcome

To assess the contribution of Time 1 variables on word reading scores at Time 2, the following Time 1 variables were entered in the regression analysis in this order; group, narrative storytelling, vocabulary, phonological awareness and word reading (see Table 5). The overall model was significant, $F(5,45) = 11.64$, $p < .001$, $R^2 = .52$. Word reading and phonological awareness at Time 1 were both uniquely related to word reading scores at Time 2 with Time 1 word reading $\beta = .70$, $t(45) = 4.30$, $p < .001$, and Time 1 phonological awareness $\beta = .54$, $t(45) = 2.06$, $p < .05$, contributing a total of 18% unique variance. Group, vocabulary and narrative failed to reach significance at all steps of the regression (see Table 5).

Phonological Awareness Outcome

To assess the contribution of Time 1 variables on phonological awareness scores at Time 2, the following Time 1 variables were entered into the regression analysis in this order; Group, narrative storytelling, vocabulary, word reading, and phonological awareness. The overall model was significant $F(5,46) = 4.60$, $p < .01$ $R^2 = .33$. However, phonological awareness at Time 1 was the only variable uniquely related to Time 2 phonological awareness scores $\beta = .41$, $t(45) = 1.97$, $p = .05$, contributing 5 % unique variance. Word reading was related at step 4 (see Table 6).

Discussion

This exploratory study compared the early literacy and social emotional skills of students in kindergarten. Kindergarten students in one of three groups (EL1, ESL, HIPPY) were compared at two time points on measures of vocabulary, word reading, phonological awareness, narrative storytelling and social-emotional skills. Students were selected from the same

classrooms and group membership for the EL1 and ESL group was based on parent-report of first language. Students in the HIPPY group were ELLs and had completed the 30-week HIPPY program for four-year old children prior to the study.

Group Differences

The first part of the results section compared the performance of children in each group on early literacy and social/emotional measures. Differences in scores between groups at Time 1 were mixed. As expected, there was a significant difference in the vocabulary scores of the EL1 and ESL/HIPPY groups, which is consistent with research examining English vocabulary development for ELLs (Hoff, 2013). Further, narrative storytelling scores were significantly higher in the EL1 group at Time 1. However, at Time 2, the HIPPY group demonstrated significantly higher mean scores on narrative storytelling compared to the EL1 group. This could be due to the fact that the HIPPY program uses children's stories to teach early language skills. Children in the HIPPY program read a story with their caregiver each week, which gives them exposure to the structure of fictional stories beyond what may be provided in the Kindergarten classroom. The EL1 group demonstrated slightly lower mean scores on measures of narrative story telling at Time 2 compared to their Time 1 scores. This can be attributed to the fact that they are not involved in an intervention, like the HIPPY students. However, it would still be expected that their scores would go up due to their age, development and time spent in the kindergarten classroom. This decrease in scores could be due to the new design of the kindergarten program as play-based with less structured story time opportunities. Further, although the Frog Story Picture books have been demonstrated to be equally reliable in measuring oral narratives (Heilmann, Rojas, Iglesias & Miller, 2016), there could have been more familiarity with the content in the first wordless picture book. It was important to use a

different story at Time 2 to prevent children from having familiarity with the pictures. However, in hindsight, it seems that the Time 2 story may have been more difficult than the Time 1 story. If there were a Time 3, it would be beneficial to have students use both stories to tell a narrative that were used in order to see if there is an improvement in scores on narrative measures using the same story.

Contrary to expectations, there was no significant difference between the groups on measures of word reading or phonological awareness skills at either time point. This is likely due to the very young age of participants and the fact that these are introductory skills for all students at that age. Alphabet knowledge and phonological awareness are taught in kindergarten and most children learn these skills once they enter formal schooling. The children may have some knowledge before school, but that is dependent on the individual child and their early home learning environment. Therefore, there is not much variety in scores since all children are learning these skills gradually together. Reading milestones expected for four-year old children include naming some letters of the alphabet, recognizing the letters in their names, naming some beginning letters or sounds of words, and matching some letters to their sounds (Zettler-Greeley, 2018).

Also, there were no significant differences between groups on measures of social strengths and social difficulties. However, correlations between social strengths and social difficulties were negative and significant, demonstrating that those students with higher scores on social strengths demonstrate lower scores on measures of social difficulties. Following classroom routines, taking turns, sharing, listening to the teacher and cooperating with peers are all skills that help young children succeed in the kindergarten classroom. Therefore, difficulties

in these social skills areas is also related to lower scores on some language measures demonstrated by the negative correlations between social difficulties and vocabulary scores.

The second part of the results section compares scores on each measure over time. Although it was anticipated that there would be interaction between group membership and time, this hypothesis was only partially supported by the findings. There is a main effect of time on scores of vocabulary, word reading and phonological awareness, with all groups demonstrating significant improvement in scores from Time 1 to Time 2. Differences in the means from Time 1 to Time 2 demonstrate expected developmental findings as all groups improved. The mean scores between groups became closer together at Time 2, indicating that most children improved and the gap between scores of ELL students and EL1 students begins to close during formal education in Kindergarten. Previous research on the acquisition of basic literacy skills for children with different language backgrounds demonstrates that children develop these skills in a similar manner (Chiappe, Siegel & Gottardo, 2002). This is mainly due to the growing connection between phonemic awareness and literacy skills for ELL children as a result of the early literacy instruction in school that is common to all children, rather than ELL children developing a familiarity with English (Chiappe, Siegel & Gottardo, 2002). There were no significant differences between the HIPPY group and ESL group. Differences between the HIPPY group and ESL group on early literacy measures were expected due to the intervention; however, despite the lack of significance for each measure, the HIPPY group demonstrated mean scores on all measures closer to the EL1 group. Possible explanations and implications of these findings will be discussed in the next section.

The final part of the results section looked at correlations between scores both within and across time as well as Time 1 scores as predictors of Time 2 scores. Not surprisingly, measures

of early literacy were significantly related to each other both within and across time, for the most part. Vocabulary and word reading scores were not significantly related to each other at Time 1 or between Time 1 vocabulary and Time 2 word reading scores. Some studies have discussed a direct role of oral language vocabulary on reading skill acquisition (Dickinson et. al, 2003; Scarborough, 2005). However, Oulette (2006) describes how in order to better understand the relationship between oral and written language, one must consider a full range of reading skills in conjunction with potentially important components of oral language. Further, the nature of associations between oral vocabulary and both decoding and reading comprehension has not been fully explained in previous research (Oulette, 2006). The results of the regression analyses demonstrated that Time 2 scores on measures of vocabulary and phonological awareness were only significantly related to their auto-regressor at Time 1, when all variables were considered together. However, both phonological awareness and word reading at Time 1 were significant predictors of Time 2 word reading at the final step of the regression. This is consistent with previous research on the relationship between vocabulary and word reading being mediated by phonological processing (Whitehurst & Lonigan, 1998) and that the link between phonological processing and reading is typically found in associations between phonological awareness and word decoding (Snowling, 2002).

The significant negative relationship between vocabulary scores and social difficulties scores demonstrated that students who experience more difficulties with social relationships and classroom routines have lower scores on measures of vocabulary. Focusing on social/emotional skills development in junior kindergarten would be beneficial in order to help students build those skills prior to expecting academic development in senior kindergarten. Alternately, weak vocabulary and language skills might result in frustration and behavioural challenges. Reducing

social difficulties in students should help the children more readily focus on academic skills, while treatment of language difficulties can enhance communication skills, which might alleviate behaviour problems.

Potential effects of the HIPPY program

There were no pre-HIPPY scores for children in the HIPPY group. Therefore, we did not have a baseline score to determine if the children improved as a result of the program. However, children who are recruited by the HIPPY program coordinators are asked to participate based on their at-risk status. These families may be new to Canada, experience poverty, or lack social support. It is possible that had those children not participated in the HIPPY program; they may have scored lower than the ESL group on measures of early literacy and social/emotional skills. Students in the HIPPY group performed better than children in the ESL and EL1 group on the narrative storytelling task at Time 2. Further, children in the HIPPY group demonstrated similar growth in their scores on measures of vocabulary, phonological awareness and word reading, which indicates they are developing skills at a similar rate as their age matched peers who did not participate in HIPPY. Interestingly, the results of the regression analyses show no effect of group on relations between Time 1 variables and Time outcomes. These results suggest that similar processes are related to reading and vocabulary in the different groups of children. Future research should obtain a pre-HIPPY score for children in order to look at improvements due to the intervention.

Language use at home

Data about language use at home were obtained through parent report. Parents reported which language was spoken at home on the consent form, but the extent of the child's comfort with their L1 and English was not assessed. We were unable to obtain an L1 vocabulary score for

children due to their young age, the diversity of languages spoken, and the children's inability to perform the first language assessment with the English-speaking researchers. Since research demonstrates that L1 vocabulary development is related to L2 vocabulary development (Lervag & Aukrust, 2010), future research should attempt to use further measures to obtain an L1 vocabulary score. It would be beneficial to follow up with these children in first grade to determine whether they continue to develop at the same rate, and to examine the differences between groups at another time point. Further, obtaining a second teacher report of social/emotional development would be beneficial. We were only able to obtain the SDQ scores at Time 1 (junior kindergarten), which is the child's first year of formal education. Looking at how the social strengths and difficulties change over time, and their relationship with academic achievement, will be important as the children progress through kindergarten and beyond.

Limitations and Future Directions

A main focus of the HIPPY program is on improving parental involvement in their child's education. However, due to restrictions imposed by a province wide teacher-strike and the international pandemic, we were unable to obtain data on parental involvement. This is an important factor to explore in further research as parental involvement is known to be positively related to school achievement (Graves & Wright, 2011). Another limitation is participant retention at Time 2. It would have been preferable to have all participants remain at Time 2 so there would have been more changes in scores to examine. Many of the families who consented to participate in this study at Time 1, moved to new communities at Time 2, with the exception of the HIPPY group who could be accessed through the HIPPY program coordinator. The particular school board that consented to have researchers visit students in the schools is known to have a transient student population. Therefore, since students were being visited within their

schools, those students who left the school board, could no longer be accessed at Time 2 for research. To address this limitation, sample sizes could be increased by extending the study into more school boards who offer the HIPPY program. The effect of school board could be analyzed within the data. Further, extending the study for a longer time period in order to look at different cohorts of children would also improve sample sizes and provide more comparisons. Although sample size is discussed as a limitation, it was sufficient according to the preliminary power analysis. Finally, to reiterate, pre-intervention scores should be collected for the HIPPY group to better determine the effects of the intervention.

Summary

Overall, this study demonstrates that kindergarten students do have varied trajectories in their language learning, but the differences in the children enrolled in this school board selected for this study, are not as profound as anticipated. All children, regardless of their language learning background, developed their early literacy skills in kindergarten. Early intervention programs, like HIPPY, should continue to be offered to at-risk children in order to help them develop the English language and social/emotional skills necessary to succeed in school.

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Table 1

Group Means Time 1 and Time 2

	EL1		ESL		HIPPY	
	Time 1 (*N=26*)	Time 2 (*N=21*)	Time 1 (*N=20*)	Time 2 (*N=14*)	Time 1 *(N=17*)	Time 2 (*N=17*)
	M(SD)	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*
PPVT	74.15(9.31)	96.41(13.04)	60.55(14.02)	81.85(12.28)	67.82(7.27)	86.94(11.88)
Woodcock Johnson	16.00(8.08)	20.29(6.91)	13.50(3.97)	20.86(6.61)	15.65(5.66)	21.18(8.44)
CTOPP	7.23(4.92)	12.09(3.3.75)	5.68(2.63)	11.77(5.46)	5.12(2.32)	12.12(5.64)
Narrative	9.17(2.44)	8.09(3.70)	7.26(2.58)	8.08(3.48)	7.94(2.58)	10.84(3.70)
SDQ Difficulties	8.88(4.94)		7.85(5.63)		9.31(6.12)	
SDQ Strengths	6.68(2.66)		7.05(3.42)		5.81 (2.90)	

Table 2

Correlations Among Key Variables (N =63)

Variables	1	2	3	4	5	6
1. Vocabulary	–					
2. Word reading	.24	–				
3. Phonological awareness	.30*	.64*	–			
4. Social difficulties	-.28*	-.15	-.28*	–		
5. Social strengths	.25	.01	.16	-.70**	–	
6. Narrative	.43**	.33**	.32*	-.15	.22	–

Note. *$p < .05$. **$p < .01$. Time 1 correlations.

Table 3

Correlations Across Time (Time 1 N=63, Time 2 N=52)

	Time 2 Variables			
Time 1 Variables	*Vocabulary*	*Word Reading*	*Phonological Awareness*	*Narrative*
1. Vocabulary	.68**	.06	.33*	.19
2. Word reading	.44*	.70**	.49*	.48**
3. Phonological awareness	.45**	.57**	.52**	.34*
4. Social Difficulties	-.37**	-.01	-.27	-.17
5. Social Strengths	.33*	-.13	.13	.04
6. Narrative	.49**	.18	.23	.41**

Note. *$p < .05$. **$p < .01$.

Table 4: Time 1 variables related to Time 2 vocabulary scores (Total $R^2 = .57$)

Step - Variables	ΔR^2	*β for step & Sig.*	*Final β*	Final t-value & Sig.
1.Group	.084	-320*	-.149	-1.47
2.Phonological awareness	.131	.393*	.035	.266
3.Word reading	.051	.336*	.234	1.84
4.Narrative	.085	.326*	.146	1.37
5.Vocabulary	.217	.531**	.531	4.91**

Note. All independent variables are scores from Time 1. * $p < .05$ ** $p < .001$

Table 5: Time 1 variables related to Time 2 word reading scores (Total $R^2 = .52$)

Step - Variables	ΔR^2	*β for step & Sig.*	*Final β*	Final t-value & Sig.
1.Group	-.017	.066	.060	.562
2.Narrative	.015	.192	.011	.099
3.Vocabulary	-.017	-.070	-.208	-1.84
4.Phonological awareness	.349	.637**	.279	2.05*
5.Word Reading	.184	.572**	.572	4.29**

Note. All independent variables are scores from Time 1. * $p < .05$ ** $p < .001$

Table 6: Time 1 variables related to Time 2 phonological awareness scores (Total $R^2 = .33$)

Step - Variables	ΔR^2	*β for step & Sig.*	*Final β*	Final t-value & Sig.
1.Group	-.020	.000	.114	.869
2.Narrative	.036	.046	.037	.271
3.Vocabulary	.015	.208	.086	.617
4.Word reading	.185	.464*	.262	1.60*
5.Phonological awareness	.045	.333*	.333	1.97*

Note. All independent variables are scores from Time 1. * $p < .05$ ** $p < .001$

Figure 1 Design Overview

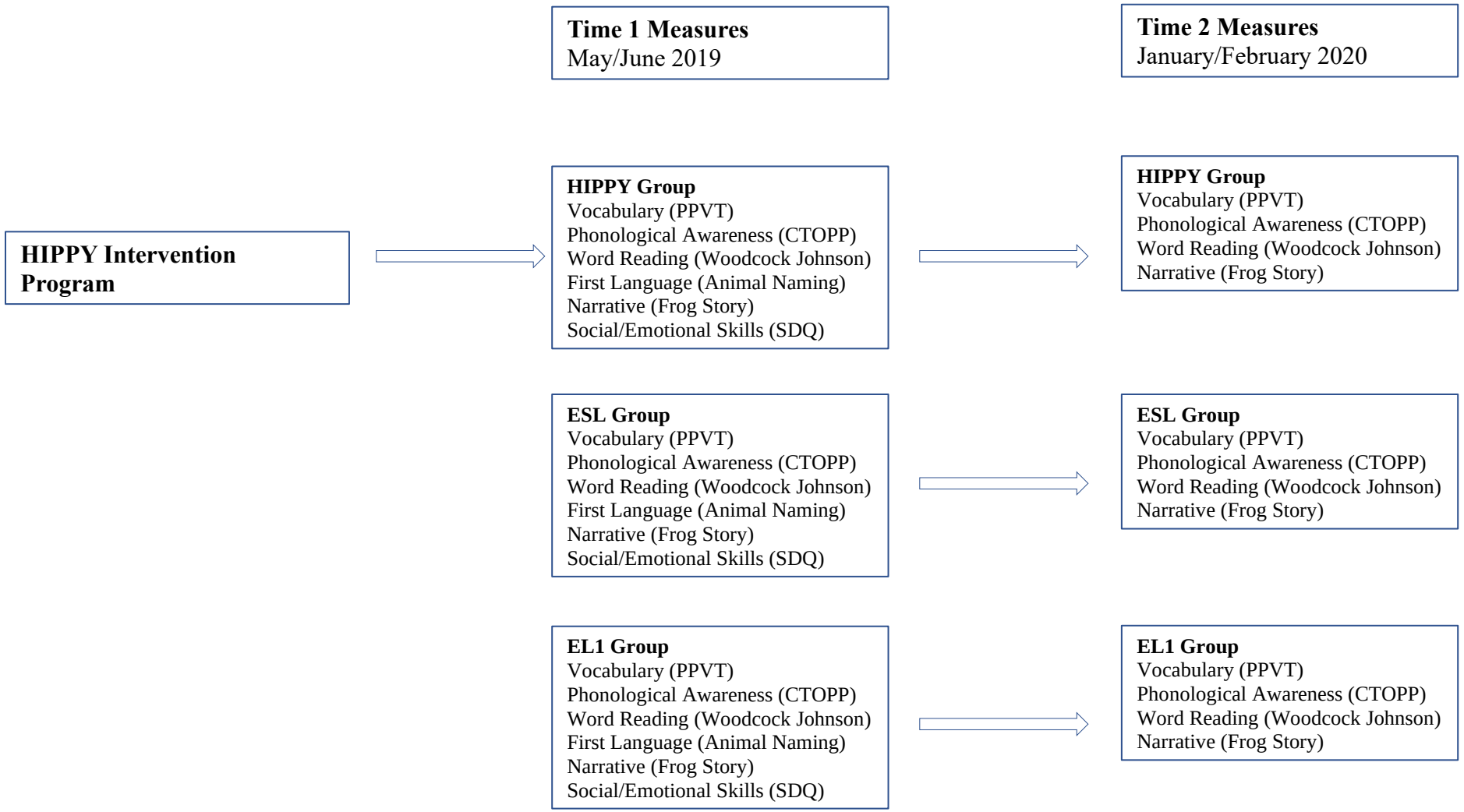

Figure 2 Episode Coding Chart for Frog Where Are You?

Episode Number	Episode
Episode 1	Boy and frog
Episode 2	Frog escapes
Episode 3	Discovers frog is gone
Episode 4	Looking for frog
Episode 5	Dog falls out window, jar breaks and boy gets angry
Episode 6	Calling for frog outside
Episode 7	Gopher incident (looking in hole, gopher comes out)
Episode 8	Boy and owl
Episode 9	Bees and dog
Episode 10	Boy searching, grabs branches but finds deer
Episode 11	Deer takes boy and throws him over a cliff into the water
Episode 12	Boy hears something and tells dog to be quiet
Episode 13	Finds frog
Episode 14	Takes baby frog home and says goodbye

Note. Participants are given a score out of 1 for each episode included. If only part of an episode is included, they receive a score of 0.5 for that episode.

Figure 3 Episode Coding Chart for One Frog Too Many

Episode Number	Episode
Episode 1	Boy receives a present
Episode 2	Boy opens present and finds baby frog
Episode 3	The big frog is jealous or upset
Episode 4	Boy introduces frog to his pets
Episode 5	Big frog is being mean to the little frog and bites his leg
Episode 6	The boy gets mad and the big frog tells him that is not nice
Episode 7	The boy and his pets go on an adventure while the pets ride on the turtle's back
Episode 8	The big frog kicks the little frog off the turtle's back
Episode 9	The boy gets angry and tells the big frog that is not nice
Episode 10	The boy tells the frog to stay behind as they go on a raft/boat with the other pets
Episode 11	When the boy is not looking, the big frog jumps on the raft
Episode 12	The big frog kicks the little frog off into the water
Episode 13	The turtle tries to get the boys attention and the boy notices the baby frog is gone
Episode 14	The boy and his pets look everywhere for the baby frog
Episode 15	They could not find the baby frog, so they decide to go home and are still upset (or any emotion) with the big frog
Episode 16	The boy and his pets lay down on his bed then hear a noise
Episode 17	The baby frog jumps in the window and lands on the big frog's head
Episode 18	Everyone was so happy the baby frog was back, even the big frog

Note. Participants are given a score out of 1 for each episode included. If only part of an episode is included, they receive a score of 0.5 for that episode.

Appendix A: Definitions of key terms

Language Trajectory refers to the pathway of language and literacy learning.

Cultural Identity refers to the image people have of themselves. Components of these self-images include the behaviours, beliefs, values, and norms of the culture related to the members of the ethnic group to which they belong (Ferdman, 1990).

At-risk status in this paper refers to students who are considered to have a higher probability of failing academically as a result of poor school readiness skills.

Dual Language Learner (DLL) is used to define students who are learning two languages simultaneously. Dual Language Learner describes children who are simultaneously developing two or more languages or those who are learning English as a Second Language while having some mastery of their home language already (Choi, Rouse & Dahyung, 2018).

English Language Learner (ELL) is used to define students who are learning English in addition to a different language at home. In the Canadian public education system and for the purposes of this study, ELLs are the students who have another language listed under ‘first language’ (L1) on their school registration form.

Early Intervention Programs are programs designed to educate children before school entry by supporting the child’s development. These programs are designed to identify and address a child’s developmental needs. The developmental needs may be physical, cognitive, linguistic, emotional or adaptive. Specifically, cognitive, linguistic and emotional development are important components of a child’s success in the kindergarten classroom and they are the main focus of this research project.

Appendix B: First language animal naming task