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Exploring the Emergent Literacy Needs of Preschoolers with Language Impairments

by

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Abstract

Current research indicates the need to identify and support children at-risk for reading difficulties as early as possible. Children with language impairments are one group of children who have been shown to be at-risk for literacy problems. Their difficulties likely stem from the challenges they tend to experience with acquiring emergent literacy skills as preschoolers. Very little empirical work has been done with preschoolers with language impairments to explore the nature of their emergent literacy development or their response to interventions which target emergent literacy skills.

In the present study, 55 preschoolers with language impairments were recruited from a speech and language centre in Southern Ontario. The nature of the relationship between children's early language and literacy skills was explored using measures of their written language awareness, phonological awareness and oral language abilities, in an attempt to better understand how to conceptualize their emergent literacy abilities. Furthermore, a between-subjects design was used to compare two language interventions: an experimental emergent literacy intervention and a standard intervention based on traditional models of speech and language therapy.

Results indicated that preschooler's emergent literacy abilities can be understood as a broad, multi-dimensional construct consisting of three separate but interrelated components: written language awareness, phonological awareness, and oral language. The emergent literacy-enhanced intervention was generally superior to the standard language intervention in improving children's skills in written language awareness, and children with the most severe impairments seemed to benefit the most from the

experimental intervention. Theoretical and practical implications, as well as areas for future research are discussed.

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CHAPTER 1

Introduction

Approximately 4% of preschoolers in Canada have a communication impairment in speech and/or language development (Canadian Association of Speech-Language Pathologists and Audiologists, 2005). For these children, their overall quality of life is threatened by the impact of their communication impairment, as they are at increased risk for experiencing a variety of social and academic difficulties (Zhang & Tomblin, 2000). For instance, research has demonstrated that children with communication impairments may be less socially competent and have more behavioural problems than their typically-developing peers (Aram, Ekelman & Nation, 1984). Furthermore, children with communication impairments may be at-risk for academic failure (Zhang & Tomblin, 2000), and in particular, have a greater risk of experiencing difficulties with learning to read than do children from the general population (Boudreau & Hedberg, 1999; Catts, 1993; Nathan, Stackhouse, Goulandris & Snowling, 2004).

Childhood communication disorders may be classified as either speech impairments or language impairments. Children with speech impairments have difficulties in speech sound production that impact their articulation and speech intelligibility (Schuele, 2004; Snowling & Haylou-Thomas, 2006), whereas children with language impairments have expressive and/or receptive language deficits in language processes such as vocabulary or grammar (Schuele, 2004; Snowling & Haylou-Thomas, 2006).

Although speech and language impairments are often comorbid (Schuele, 2004), it has been proposed that it is the language impairment rather than the speech impairment

that is the main contributing factor which leads to poor literacy outcomes (Bishop & Adams, 1990; Catts, 1993; Nathan et al., 2004). Indeed, children with language impairments appear to be particularly at-risk for poor literacy outcomes (Bishop & Adams, 1990; Catts, 1993; Nathan et al., 2004), and up to 80% of preschool children with language impairments later display some degree of reading impairment (Jenkins, Jewell, Leicester & O'Conner, 1994). In fact, even as young adults, many individuals who had language impairments as preschoolers meet the criteria for reading disabilities and other forms of learning disabilities (Young et al., 2002). From here children may be at further risk of social and emotional problems, as learning difficulties are associated with a host of problems including anxiety, depression, poor self-concept and low academic achievement (Lerner & Kline, 2006). For instance, researchers have found that youth with learning disabilities are more prone to depression and poor self-esteem (Bender & Wall, 1994; Margalit & Levin-Al-yagon, 1994; Palladino, Poli, Masi & Marcheschi, 2000); have poorer quality friendships (Wiener & Schneider, 2002); and are more likely to experience peer victimization (Nabuzoka & Smith, 1993) than their peers without learning disabilities.

Considering the detrimental impact of early learning difficulties on children's well-being, in recent years, researchers have emphasized the importance of providing early effective programming for children who may be at-risk for reading difficulties – including children with language impairments (Snow, Burns & Griffin, 1998). For these children, it has been suggested that language and literacy development should be addressed simultaneously in an integrative intervention by enhancing typical language therapy with early literacy support (Gillon & Dodd, 2005; Schuele, Spencer, Barako-

Arndt & Guillot, 2007; Tallal, Allard, Miller & Curtiss, 1997). However, integrative interventions have not traditionally been a part of preschool speech and language therapy services in Ontario. Historically, traditional speech and language therapy has focused primarily on children's speech and language needs; the majority of speech and language interventions have traditionally *not* included components of early literacy such as written language and phonological awareness, nor have these programs typically included the practice of addressing language goals using books and literacy-based activities. Yet with an increasing body of research in recent years which supports a link between language and literacy, organizations and governing bodies have recognized the need to reconsider the role of speech-language pathologists in addressing the promotion of literacy needs in preschoolers. For instance, in the United States, the American Speech and Hearing Association has recently broadened the role of speech-language pathologists by redefining the scope of speech-language therapy to include "providing services for disorders of language, including comprehension and expression in oral, written, graphic, and manual modalities; language processing; pre-literacy and language-based literacy skills, including phonological awareness" (ASHA, 2001b). As such, there has been a shift in the early language interventions provided by speech-language pathologists to include components of early literacy such as written language and phonological awareness. Including these important emergent literacy skills in early language interventions may provide children with the foundation they need to avoid the reading difficulties that far too often result from early language impairments.

Although many researchers recognize the need for a multi-faceted intervention that addresses both language and literacy goals in preschoolers with language

impairments, very few empirical studies exist which have documented the effectiveness of such an intervention. Furthermore, there is some discrepancy as to which early skills in language and literacy should be conceptualized as “emergent literacy” skills and included in a multi-faceted emergent literacy intervention. The present study seeks to address these issues. In this thesis, I attempt to clarify the relationship between children’s early language and literacy abilities in order to better understand how to conceptualize “emergent literacy”. I then investigate the effectiveness of an experimental emergent literacy-enhanced language intervention by measuring its impact longitudinally over approximately six months, as children with language impairments progress from preschool to kindergarten. This experimental intervention is an adaptation of a published program called *Read It Again!* Language and Literacy Supplement for Preschool Programs, designed by Justice, McGinty, Beckman, and Kilday (2006), and is designed to improve children’s abilities in aspects of written language and phonological awareness and oral language that have been shown to be predictive of later reading ability. The primary objective of the study is to compare the effectiveness of the experimental intervention with standard language therapy (which does not include literacy-related goals) in developing children’s language and literacy skills. In short, this study is my attempt to better understand the nature of emergent literacy and the support required by children with language impairments in order to limit their risk of future reading difficulties.

CHAPTER 2

Literature Review

In educated societies worldwide, the ability to read is inarguably one of the most critical and highly valued skills that individuals can acquire. Although most children develop this skill without much difficulty once they are exposed to formal reading instruction upon entering school, a number of children do experience difficulties in learning to read (Snow et al., 1998). In recent years, researchers have acknowledged that identifying and supporting children who experience difficulties with reading as early as possible is crucial in order to prevent a host of negative outcomes which have been associated with learning and reading disabilities. This concern may have evolved out of the realization that traditional educational practices do not adequately address the needs of children with reading difficulties. For example, the diagnosis of learning disabilities, including reading disabilities, is often delayed until the late primary grades (Catts, 1991a,b), when a significant discrepancy is observed between a child's IQ or grade level and the child's level of achievement (Lerner & Kline, 2006; Lyon et al., 2001; Snow et al., 1998). By this time, children have often been struggling with learning to read for several years (Catts, 1991a,b); their motivation and self-esteem may be impacted by their continuous failure (Boudreau & Hedberg, 1999), and if they have not already received remedial support, it is unlikely they will ever catch up to their peers in reading (Lyon et al., 2001).

Snow et al. (1998), among others, have recognized the problems associated with such an approach, and have called for earlier identification and early effective programming for children who may be at-risk for reading difficulties. It has been argued

that early identification of those at-risk for reading difficulties would enable professionals to limit the development of these problems and put at-risk children back on the path toward normal reading development (Hurford & Schauf, 1994; Justice, Invernizzi & Meier, 2002; Lyon et al., 2001; Torgesen, Wagner & Rashotte, 1997).

There is evidence to suggest that children who are at-risk for reading difficulties can be identified in the preschool years, prior to their exposure to formal schooling (Snow et al., 1998). At this time, children are in the emergent literacy stage of literacy acquisition (Teale & Sulzby, 1986); for some preschoolers – such as those with language or hearing impairments, those from low-income families, or those who have limited proficiency in English, for example – intervention is essential to support language and literacy development at this important stage (Snow et al., 1998). In order to ensure that preschool children who are at-risk for reading difficulties receive the emergent literacy support they require, it is important that parents, educators, and other professionals concerned about children's literacy development understand the nature of emergent literacy and how to recognize and support children in the emergent literacy phase who are at-risk for future reading difficulties (Snow et al., 1998). What follows is a discussion of emergent literacy and a look into a particular population of preschoolers (children with language impairments) who may especially require support in the emergent literacy phase of literacy development.

Emergent Literacy

Defining Emergent Literacy

In 1986, Teale and Sulzby formally introduced the term, “emergent literacy” to define the developmental period from birth through age six when children are “in the

process of becoming literate” (p. xix). They argued that during this phase, children are developing, learning and acquiring necessary skills in written language, even though they have yet to be exposed to formal schooling (Teale & Sulzby, 1986). This perspective differs from more traditional approaches, by conceptualizing literacy acquisition along a developmental continuum, rather than viewing literacy as a skill that is either acquired or not when children enter school (Lonigan, Burgess & Anthony, 2000; Whitehurst & Lonigan, 1998).

Since it was first conceptualized in 1986, researchers have used the term “emergent literacy” rather broadly to refer to a variety of literacy-related skills and environments, and the term has become complicated as researchers have used multiple perspectives and research methodologies to inquire about children’s emergent literacy abilities (Whitehurst & Lonigan, 1998). This inconsistency in the use of the term has made it difficult for researchers and practitioners to operationalize the construct of “emergent literacy”. It has been argued that refining what is meant by “emergent literacy” is critical in developing our understanding of the concept and solidifying links between research and practice; for example, a clear understanding of what constitutes emergent literacy is essential in guiding the design of effective emergent literacy interventions (Sénéchal, LeFevre, Smith-Chant & Colton, 2001). What follows is a brief discussion of how emergent literacy has been conceptualized differently by three different groups of researchers.

Early models of emergent literacy defined the term as a broad unitary construct comprised of skills and behaviours transcending three main sets of skills: written language awareness (including both print awareness, i.e. knowledge about the functions

of print; and alphabet knowledge); phonological awareness – that is, knowledge about the sound structure of language) and oral language (i.e. vocabulary and narrative abilities; Sénéchal et al., 2001). For example, skills in each of these three areas were included in a two-component model of emergent literacy suggested by Whitehurst and Lonigan (1998). In their model, emergent literacy is comprised of inside-out processes (which include skills in alphabet knowledge and phonological understanding – components of written language awareness and phonological awareness, respectively) and outside-in processes (which include abilities such as narrative and semantic understanding – components of oral language).

Yet more recently, researchers have challenged the notion that emergent literacy can be conceptualized so broadly. For example, following a comprehensive examination of previous theoretical models and empirical investigations, Sénéchal et al. (2001) concluded that emergent literacy should actually not be considered a unitary construct comprised of skills in written language awareness, phonological awareness and oral language. Instead, they argued that emergent literacy is comprised merely of skills in written language awareness, including children's print knowledge and alphabet knowledge; therefore, emergent literacy should be viewed as a narrow construct which is distinct from the constructs of phonological awareness and oral language. The authors provided some empirical support for this new, narrower model of emergent literacy. In a longitudinal investigation of 84 kindergarteners' early written language awareness (print and alphabet knowledge), phonological awareness and oral language (vocabulary) skills, as well as their later reading abilities, the correlational patterns among the variables revealed very complex, changing interrelations. For instance, while print awareness was

related to alphabet knowledge and oral language but not phonological awareness in kindergarten, alphabet knowledge was related to print awareness and phonological awareness, but not oral language. One year later, the patterns of interrelations were the same between alphabet knowledge, phonological awareness and oral language, but print knowledge was no longer related with any of these skills. Furthermore, some skills were found to have a unidirectional influence on the development of other skills, while others developed reciprocally. In addition, certain skills measured in kindergarten and at the start of grade one impacted reading acquisition in grade one, but not fluent reading in grade three. Sénéchal et al. (2001) claimed that the finding of these very specific longitudinal links among children's written language awareness, phonological awareness and oral language skills emphasizes the need to distinguish between them and provides justification for thinking about emergent literacy (which they describe as written language awareness) as something separate from phonological awareness and oral language.

In contrast to the narrower model of emergent literacy proposed by Sénéchal et al. (2001) which suggested that emergent literacy be thought of only as skills in written language awareness, Justice and colleagues (Justice, Chow, Capellini, Flanigan, & Colton, 2003; Justice & Ezell, 2004; 2001; Justice & Pullen, 2003) have published a host of theoretical and empirical papers in which emergent literacy has been defined differently. For example, although Justice and her colleagues also make explicit distinctions between children's skills in the three areas of written language awareness, phonological awareness and oral language (as Sénéchal et al. 2001 do), they include both written language and phonological awareness in their definition of emergent literacy, as

opposed to only including the former. Furthermore, in their view, although oral language is not considered to be a component of emergent literacy, they recognize it as a skill which is highly correlated with emergent literacy and literacy development in general (Justice et al., 2003; Justice & Ezell, 2004; 2001; Justice & Pullen, 2003).

Clearly, although researchers in the emergent literacy field agree that it is worthwhile to make distinctions among early abilities such as written language awareness (including both print and alphabet knowledge), phonological awareness skills, and oral language skills, there is some uncertainty as to which of these skills comprise the concept of emergent literacy. For the most part – with the exception of the empirical work by Sénéchal et al. (2001) – this issue has been dealt with at a purely theoretical level, where the definition of emergent literacy has been briefly outlined by researchers, but these definitions have not been supported or explored empirically. In the present study, I explore this issue further by empirically investigating the construct of emergent literacy and the nature of the relationships between skills in written language awareness, phonological awareness and oral language.

Literacy Development

During the past two decades, the acceptance of the “emergent literacy” perspective by researchers has made an important contribution to our understanding of literacy development (Whitehurst & Lonigan, 1998). Importantly, researchers now acknowledge that before children even begin formal schooling, there are individual differences that exist – such as differences in emergent literacy abilities – which account for later differences in reading ability (Lonigan et al., 2000). In order to understand how individual differences in emergent literacy abilities develop in preschoolers, the social-

interaction-based Vygotskian theory is often applied (see van Kleeck, 1990; Justice & Ezell, 1999). It has been proposed that emergent literacy acquisition is a sociocultural process (Justice & Pullen, 2003), whereby children develop emergent literacy knowledge and acquire concepts and skills within the context of supportive interactions with adults, such as parents or clinicians (van Kleeck, 1990; Justice & Ezell, 2004). From this perspective, emergent literacy skills are first introduced to the child with intensive support from an adult, who, as the child becomes more competent, gradually relinquishes control to the child until the child is eventually able to demonstrate acquisition of the concepts independently (van Kleeck, 1990; Justice & Ezell, 2004).

Whereas the Vygotskian perspective explains emergent literacy skill acquisition as occurring within the context of socially mediated interactions with an adult, Piagetian principles may also be useful in understanding how children independently acquire emergent literacy concepts (van Kleeck, 1990). As Sulzby (1986) notes, “children construct ideas about reading and writing that are not taught to them, are not modeled for them, and are not yet conventional” (p. 52); viewing emergent literacy development as at least partially a product of the child actively constructing his or her own knowledge about reading and writing is, in essence, viewing emergent literacy development through a Piagetian lens (van Kleeck, 1990). It seems reasonable to accept that both Vygotskian and Piagetian principles offer valid explanations of how children acquire emergent literacy knowledge (van Kleeck, 1990). That is, children may depend on adult guidance to fully develop their emergent literacy skills, while also actively constructing their own knowledge about print.

The emergent literacy abilities that children develop through social interactions and self-constructed knowledge provide them with a foundation upon which they build skills in conventional reading and writing (Justice et al., 2002; Justice & Pullen, 2003). Although the term “emergent literacy” may be used inconsistently by researchers and there is some confusion as to which skills should be classified as emergent literacy skills, there is less confusion about the importance of children’s early abilities with regards to print awareness, alphabet knowledge, phonological awareness, and oral language. Researchers have consistently found a strong link between the skills children demonstrate upon entering school, and their later academic achievement (Lonigan et al., 2000). For example, numerous studies have shown that children’s performance on various emergent literacy tasks reliably predicts their later literacy achievement. In an early study in the UK, Blatchford, Burke, Farquhar, Plewis and Tizard (1987) tested 343 four-year-olds at the end of nursery school on emergent literacy skills such as letter identification and print knowledge, as well as skills in word matching, word reading, oral vocabulary, and handwriting. When 245 of the children were followed up as seven-year-olds, their reading was significantly related to each of the previously-assessed preschool skills. Interestingly, the preschool skill which was most highly correlated with reading at age seven was one of the emergent literacy skills: letter identification ($r = .61$); the other emergent literacy skill measured in preschool (concepts about print) was the least correlated with reading at age seven ($r = .27$), although in general, children performed very poorly on the concepts about print task. Multiple regression analysis also demonstrated that letter identification, handwriting scores and vocabulary at age four were independently and significantly related to reading at age seven, explaining about

40% of the variation in reading scores. Children's print knowledge as preschoolers, although significantly related to later reading, was not an independent predictor of reading at age seven; the influence of this skill was indirect as it influenced children's skills in other areas which were directly related to later reading.

Over a decade later in the United States, Lonigan et al. (2000) also examined a variety of early literacy-related skills in preschoolers and similarly found that early letter knowledge was an important predictor of children's later reading achievement. In this study, two samples of preschool children, one younger ($n = 96$, mean age = 41.02 months) and one older ($n = 97$, mean age = 60.04 months) were assessed on two occasions with a variety of measures. Phonological sensitivity measures included a rhyme oddity detection task, an alliteration oddity detection task, a blending task, and an elision task; oral language and cognitive ability measures included a receptive vocabulary test, a descriptive language test, and an expressive grammar task; letter knowledge measures included letter-name and letter-sound tasks; environmental print measures included a task involving pictures of print in an environmental context (e.g., a Coke machine); print concepts measures assessed children's understanding of print directionality, book handling, etc., and word decoding measures included a word identification task. In general, results indicated that letter knowledge and phonological sensitivity in preschool was significantly related to children's decoding ability a year later. Together, these two skills accounted for 54% of the variance in children's later reading abilities. Interestingly, preschoolers' performance on the environmental print and print concepts tasks were not unique predictors of later reading when considered in a statistical model which included

letter knowledge and phonological sensitivity, although they were associated with reading when they were considered as isolated skills.

Further support for the importance of letter knowledge and phonological awareness can also be found in a more recent study (Catts, Fey, Zhang & Tomblin, 2001) which was concerned with predicting children's later reading comprehension skills, rather than their later decoding abilities. Six hundred and four kindergarten children (many of whom had language impairments) were assessed on a test of language abilities, a measure of narrative abilities, a nonverbal cognitive measure, a rapid automatized naming task, a phonological awareness measure involving a phoneme/syllable deletion task, and a letter identification measure. Follow-up tests of reading comprehension were completed in grade two. The results revealed that both the letter identification and phonological awareness tasks, as well as an expressive oral language task, the rapid automatized naming task, and mother's education level all uniquely predicted the probability of reading comprehension difficulties in second grade. Again, letter identification was the single best predictor of later reading ability.

Clearly, children's emergent literacy skills can be very informative with regards to understanding their expected developmental trajectory in literacy acquisition. Given the evidence that children's emergent literacy skills are predictive of their future literacy achievement, it seems obvious that researchers, educators and practitioners should concern themselves with identifying and supporting "vulnerable learners": those children who are at-risk for experiencing difficulties in the acquisition of emergent literacy (Justice & Kaderavek, 2004, p.233). Vulnerable learners may include children with developmental disabilities or communicative impairments, or those children who come

from an impoverished environment or who speak English as a second language (Justice & Kaderavek, 2004). One particular group of vulnerable learners – children with language impairments – is the focus of the next section of this thesis.

Understanding Language Impairments and Literacy Development

Children with language impairments are considered to be among those “vulnerable learners” who are at-risk for experiencing difficulties in acquiring emergent literacy skills (Justice & Kaderavek, 2004). This is not surprising, given that oral language skills and emergent literacy skills are thought to be interdependent (Tunmer, Herriman & Nesdale, 1988; Adams, 1990), developing reciprocally in the preschool years (Boudreau & Hedberg, 1999; Lonigan et al., 2000). For example, oral language skills have been shown to be significantly interrelated with both written language awareness and phonological awareness in preschoolers (Lonigan et al., 1999). Furthermore, considering the nature of the deficits experienced by children with language impairments, it is easy to understand why these children will also experience difficulties in learning to read. Bishop and Snowling (2004) used the term “double deficit” to explain that children with language impairments have deficits in two main areas of language processing. These children experience difficulties in both phonological as well as nonphonological (i.e., semantic, syntactic and discursive) language processes. These processes underlie the basic reading skills of decoding and comprehension which must be integrated for proficient reading (Schuele, 2004); deficits in these language processes may compromise literacy development. For example, difficulties in phonological processing may lead to problems in decoding text; deficits in semantic representations may lead to problems with comprehending text; weak syntactic skills may lead to difficulties in using sentence

context to interpret and make meaning of unfamiliar words; and poor discourse skills may lead to problems comprehending multisentence texts (Bishop & Snowling, 2004).

In understanding the relationship between language impairments and emergent literacy difficulties, it is important to recognize that although children with language impairments are generally considered a heterogeneous group (Aram & Nation, 1980), literacy-related difficulties permeate the distinctive boundaries that are often used to classify children with language impairments. For instance, distinctions are often made according to whether the language deficits exist in isolation, or whether they are accompanied by a general cognitive delay. A language impairment that exists in the absence of any nonverbal delays is classified as a specific language impairment (SLI), whereas a language impairment that is accompanied by below-average verbal and nonverbal abilities (although IQ must still be above 70 in order to rule out the possibility that the language difficulties are a result of a developmental delay) is classified as a nonspecific language impairment (NLI) (Catts, Fey, Tomblin & Zhang, 2002). Although this distinction has traditionally been deemed an important one, recent research has demonstrated that children with both SLI and NLI are at-risk for reading difficulties (Catts et al., 2002), and that nonverbal IQ is irrelevant in predicting children with language impairments' response to language intervention (Cole, Dale, & Mills, 1990); consequently, researchers have begun to question the usefulness of this distinction (Tager-Flusberg & Cooper, 1999).

A second distinction that is often made among children with language impairments involves the nature of their language difficulties: whether they affect receptive and/or expressive language. Receptive language refers to one's understanding

of verbal symbols. Receptive language impairments may involve difficulties in understanding the meaning of single words, sentences, or longer speech units. Children with a receptive language impairment may also have difficulty with blending letter sounds, recognizing morphemes within sentences, and tone discrimination (Lerner & Kline, 2006). Children with expressive language impairments on the other hand, can understand speech and language produced by others, but have difficulties with producing spoken language. Children with expressive language impairments may also be unable to remember and express words and they might have difficulties formulating complete sentences (Lerner & Kline, 2006). Again, although it is obviously important from a clinical standpoint to classify children with language impairments according to whether their deficits are expressive or receptive in nature, it is questionable whether the type of language impairment is relevant when considering the relationship between language impairments and later reading difficulties (Catts, 1991a). Considering that making these distinctions among children with language impairments may not be useful in the context of understanding the relationship between preschool language impairments, response-to-intervention, and emergent literacy development, and given the need to understand a broadly-defined population of young children with language impairments (Aram & Hall, 1989), in this thesis I adopt an approach that collapses these particular subgroups of children with language impairments while instead considering the population as a whole. In the next section of this thesis, I examine empirical research which sheds light on the documented literacy-related difficulties experienced by this population of children.

Language Impairments and Reading Difficulties

Previous research has demonstrated that preschoolers with language impairments often go on to develop later difficulties in reading and writing (Lerner & Kline, 2006). It is estimated that over 50 percent of children who have language impairments as preschoolers later experience academic problems such as reading difficulties (Aram & Hall, 1989; Catts & Kamhi, 1999). Early language impairments are so strongly associated with later reading difficulties that some researchers have claimed that the presence of language impairments in preschool should be taken as an early indicator of reading disabilities (Catts, 1991a,b; Carroll & Snowling, 2004). Indeed, there is ample evidence to suggest that preschool language impairments do in fact lead to poor literacy outcomes.

Research into the early abilities of preschoolers with language impairments has led to the speculation that these children may lack the skills needed to benefit from formal reading instruction when they begin school (Schuele, 2004). Support for this claim has been offered by Catts (1991a; 1993), who found that by the time children with language impairments enter grade one – the grade in which formal reading instruction often begins – they are already falling behind their non-impaired peers. This is not surprising, given that by nature, many children with language impairments have weaknesses in oral language skills that researchers have found to be strongly associated with literacy acquisition, such as vocabulary (i.e., Blatchford et al., 1987; Lonigan et al., 2000) and narrative abilities (Paul & Smith, 1993). Yet it has also been suggested that another reason preschoolers with language impairments may have reading difficulties later in life stems from the difficulties these children often encounter with acquiring emergent literacy skills (Boudreau & Hedberg, 1999; Snow et al., 1998). Gillam and

Johnston (1985) provided one of the earliest accounts of emergent literacy difficulties in preschoolers with language impairments. They compared 10 preschoolers who had been identified as language impaired by a certified Speech-Language Pathologist with 10 normally developing preschoolers on a variety of print awareness tasks. The children with language impairments performed more poorly than their peers on tasks that required them to match high-frequency environmental print to the objects represented by the print, and children's general oral language ability was a good predictor of their ability to interpret decontextualized print.

More recently, Boudreau and Hedberg (1999) also noted differences between 18 language-impaired and 18 typically developing preschool children on print awareness tasks. In particular, there were significant between-group differences on a variety of tasks that assessed book handling and basic print concepts, with the most marked difference on items which measured children's ability to identify units of print such as letters, words, capital letters, etc. In addition, the children with language impairments also performed more poorly than typical peers on tasks assessing children's understanding of rhyme and their knowledge of letter names.

Similar results were also found by Raitano, Pennington, Tunick, Boada and Shriberg (2004), who found that in a sample of 101 5- to 6-year old children with speech sound disorders, the presence of a language impairment was associated with poor performance on a letter knowledge task as well as various measures of phonological awareness (rhyme judgement, segmenting, blending and sound matching). Taken together, the results of these studies make it clear that children with language

impairments do struggle in acquiring fundamental emergent literacy skills as preschoolers.

It is important – albeit not surprising considering the strong relationship between emergent literacy abilities and later reading achievement – to recognize that the literacy difficulties experienced by children who have language impairments as preschoolers often persist beyond the emergent literacy stage. Tallal et al. (1997) noted that children with language impairments develop literacy skills at a different rate than their typically developing peers, and in fact, tend to fall further behind their classmates in reading in the early elementary school years, rather than catching up. Many empirical studies exist (e.g., Aram et al., 1984; Bishop & Adams, 1990; Catts et al., 2002; Menyuk et al., 1991; Snowling, Bishop & Stothard, 2000; Stark et al., 1984) which demonstrate the long-term impact of early language impairments on later reading abilities. Differences in reading ability are evident among children with and without language impairments even in the early elementary years, when children are just becoming fluent readers. For instance, Menyuk et al. (1991) found that 50% of children who were identified as language impaired at approximately 5 years of age demonstrated deficient reading ability three years later. The rate of reading difficulties in this group was higher than two other groups of children considered to be at-risk for reading problems, including a group of premature children and a group who had experienced language delays early in life but had no significant language disorder at the time of testing; no data was available concerning the rate of reading difficulties in typically developing same-aged peers. Catts et al. (2002) on the other hand, compared the early literacy achievement of 208 children who were identified with a language impairment in kindergarten, with that of a control group of 362

typically developing children. In second grade, nearly 53% of children with language impairments met the criterion for reading disabilities, and many more were considered poor readers. In fourth grade, 48% were classified as reading disabled. These numbers were significantly lower in the unimpaired children, where only 8.6% and 8.2% met the criterion for reading disabilities in second and fourth grades respectively.

Beyond the elementary years, evidence indicates that reading problems for children diagnosed with language impairments as preschoolers may also persist into middle childhood and adolescence. In an early study, Aram et al. (1984) investigated the academic achievement of 20 adolescents aged 12 to 16, who 10 years earlier had been diagnosed as language disordered in preschool by speech-language pathologists. As adolescents, only 25% of the group scored above the 50th percentile for reading and spelling, and well over half scored below the 25th percentile. In another longitudinal study, the reading abilities of 29 children who had been diagnosed with specific language impairments between the ages of 4.5 and 8 years were tested three to four years later. At this time, children with language impairments were achieving reading scores that on average, were two grades below the level expected based on their age; in contrast, all of the children in a typically developing control group were reading at or above grade level (Stark et al., 1984). Bishop and Adams (1990) found that in children who had language impairments at 4.5 years of age, 8% had reading disabilities related to reading accuracy, while 12% had reading disabilities related to reading comprehension at age 8.5. A follow-up of many of these children at age 15 revealed that of those who would have been considered to have a specific language impairment at age 5, 43% had reading

impairments in reading accuracy, and 23% had reading impairments in reading comprehension (Snowling et al., 2000).

Clearly, a significant proportion of children who have early language impairments go on to develop difficulties acquiring early literacy skills and developing their skills in fluent reading. Yet not all preschoolers with language impairments develop reading problems. In fact, in a study by Magnusson and Naucler (1990), where 37 children with preschool language impairments were paired with a demographically-similar typically developing peer, 15 of these language-impaired children were actually better readers than their typically developing peer at the end of fourth grade. An important question then becomes, which factors account for differences in literacy outcomes observed in children with early language impairments? The risk for reading problems appears to be greatest when the language impairment is severe (Catts et al., 2002), broad in scope (deficits in more than one area of language processing; e.g., Bishop & Adams, 1990) and/or persistent (the problem is not resolved in early childhood; e.g., Catts et al., 2002). Severe language impairments may be particularly problematic because children with severe impairments may not respond to literacy-related interventions as well as children with less-severe impairments (Justice et al., 2003).

Thus, although some children with language impairments do manage to avoid developing reading problems, preschool language impairments remain a major risk factor for later literacy difficulties. A likely result of these difficulties is decreased motivation for reading, which in turn will lead to decreased exposure to print (Snowling et al., 2000). Given that reading is such an important avenue through which school-age children develop their language abilities, low print exposure and reading difficulties may be

particularly devastating for children who are already experiencing impaired language development (Scheule et al., 2007). This is one reason that early literacy intervention is essential with this population; principles of such interventions are discussed next.

Intervention

Basic Principles

For years, researchers and clinicians have acknowledged that children with language impairments require early intervention in order to prevent the learning, behavioral and self-esteem difficulties that often accompany language problems (i.e., Stark et al., 1984). Intervention programs focused only on language development are insufficient for addressing the literacy needs of children with language impairments (Gillon & Dodd, 2005). Instead, interventions need to be integrative, aimed at addressing both oral and written-language deficits simultaneously (Gillon & Dodd, 2005; Justice & Ezell, 2004; Tallal et al., 1997); since many children with language impairments are already receiving intervention of some kind, it makes sense to simply expand these language interventions to include activities designed to prevent reading difficulties (Catts, 1993). More specifically, it has been suggested that early intervention efforts for young children with language impairments should promote the development of emergent literacy skills, which will equip children with the skills they need to benefit from formal reading instruction upon entering school (Schuele et al., 2007). Since it is impossible to identify with certainty which children with early language impairments are at-risk for future reading difficulties (Catts et al., 2001), it is advisable to assume that all preschoolers with language impairments are at-risk for difficulties learning to read, and

therefore, should receive early interventions focused on emergent literacy development (Schuele et al., 2007).

As a group of clinicians charged with the responsibility of assisting preschoolers with language impairments, speech-language pathologists have a critical role in promoting and fostering literacy, including emergent literacy, among children with communication disorders (American Speech-Language-Hearing Association, 2001a). In embracing this role, it is recommended that speech-language pathologists target multiple goals within their language intervention sessions, focusing on both language and literacy goals (Scheule et al., 2007). It is also recommended that in delivering these language-literacy focused treatments, speech-language pathologists combine elements of both an embedded and an explicit approach to therapy (Justice & Kaderavek, 2004).

Embedded approaches emphasize the opportunity to provide naturalistic, child-directed interactions with written language. In this case, the adult is a facilitator of the child's learning by mediating children's play with literacy-related artefacts and contextualized print (Justice & Kaderavek, 2004). For example, in an emergent literacy program for preschoolers with a variety of disabilities, Katims (1991) created a print-rich classroom where adult-child storybook readings were frequent, and children's exposure to print was enhanced by increasing their access to a variety of literacy artefacts (e.g., story-books, lists, schedules, labels, etc.). Over the school-year, children in this literacy-rich environment achieved greater gains in print awareness than did children in a control group. Repeated exposure to storybooks is another highly effective example of a naturalistic, embedded approach to language-learning (Justice & Kaderavek, 2004). For example, Whitehurst et al. (1994) demonstrated that 4-year-old children who were

engaged in an intervention consisting of dialogic reading where story-books were read and discussed in small groups in the classroom and one-on-one with an adult at home, as well as phonemic awareness activities at school, experienced greater improvements in print awareness, writing and some aspects of language and linguistic awareness compared to a control group. Another shared reading technique, print referencing, involves using verbal and nonverbal cues during shared storybook reading interactions to draw children's attention to the forms, features, and functions of written language (Justice & Ezell, 2004). This technique is particularly effective in facilitating the development of print awareness and alphabet knowledge (Justice & Ezell, 2002).

In contrast, in an explicit approach, the clinician aids the child in developing specific skills by providing structured, sequenced instruction. Literacy activities are usually decontextualized, focusing more on a direct route to develop basic skills rather than the meaning behind the various activities. The clinician, not the child, is in control of the goals, materials, and content for the session, and techniques such as modeling, demonstration, and repeated practice are common (Justice & Kaderavek, 2004). Phonological awareness is one emergent literacy skill that may be particularly difficult to facilitate in naturalistic settings; several researchers have indicated that an explicit approach is necessary for facilitating phonological awareness development in children with language impairments (e.g., Justice et al., 2003; O'Connor, Jenkins, Leicester & Slocum, 1993). Many interventions have demonstrated success when explicitly teaching phonological awareness skills to children at-risk for reading difficulties. For example, Gillon (2005) examined the impact of a program for preschoolers with speech impairments which involved explicit teaching of phoneme detection, phoneme

categorization, initial phoneme matching, phoneme isolation, letter names, and letter sounds through clinician-directed activities. Children who received the intervention made significantly greater gains in these skills than typically developing peers who did not receive the intervention.

Clearly, both embedded and explicit techniques may be valuable in facilitating various emergent literacy skills in an intervention for preschoolers with language impairments. Next, it is important to consider which specific aspects of emergent literacy are most important to be included in such interventions.

Skills to Include in an Emergent Literacy Intervention

Boudreau and Hedberg (1999) noted that many interventions for preschoolers with language impairments have targeted only phonological awareness skills and suggested that additional research is needed to examine broader, multi-faceted intervention approaches for supporting early literacy acquisition in children with language impairments. Four domains that are critical for inclusion in emergent literacy instruction have been identified by The Early Reading First program – a program which was Established under the No Child Left Behind Act of 2001, designed to ensure that every preschooler in the United States acquires the fundamental knowledge and skills they need for successful reading development in kindergarten and beyond. The four domains include alphabet knowledge, print awareness, phonological awareness and oral language (U.S. Department of Education, 2007). Justice, Sofka and McGinty (2007) re-conceptualized these four domains as two interrelated domains including code-related skills (skills in alphabet & letter-sound knowledge, print awareness, and phonological awareness) which are particularly important for later decoding abilities (Storch &

Whitehurst, 2002) and meaning-related skills (including oral language skills in vocabulary, grammatical understanding, and narrative), which are especially predictive of later reading comprehension abilities (Storch & Whitehurst, 2002).

Code-Related Skills

Alphabet knowledge. One target in emergent literacy interventions should be children's alphabet knowledge (Justice et al., 2007; Nathan et al., 2004; Schuele et al., 2007, U.S. Department of Education, 2007). Alphabet knowledge (familiarity with letters of the alphabet) is a specific component of print knowledge. Decades of research has consistently demonstrated that alphabet knowledge is one of the strongest predictors of later reading achievement (Snow et al., 1998). Learning letter names may be especially difficult for children with language impairments due to their limited vocabulary (Schuele et al., 2007). To develop this skill, children should have the opportunity to practice recognizing the letters of the alphabet in both upper- and lower-case forms in a variety of contexts (Justice et al., 2007; Schuele et al., 2007). In addition, children need to develop their knowledge of letter-sound correspondence (Justice et al., 2007; Schuele et al., 2007), as well as more complex sound correspondences such as digraphs and sound variations for some letters (Justice et al., 2007). These skills may be facilitated incidentally through engagement with alphabet books, blocks and puzzles, and can also be taught explicitly by an adult, as repeated exposure is of utmost importance for acquiring alphabet knowledge (Schuele et al., 2007).

Print Concepts. Print knowledge encompasses children's knowledge of the forms and function of print (Kaderavek & Justice, 2004), and research has demonstrated that print knowledge skills at preschool-age are associated with later reading ability (e.g.,

Whitehurst & Lonigan, 1998). In fact, a recent meta-analysis has found that taken together, children's knowledge of print concepts and the alphabet (the skills collectively referred to as 'written language awareness' throughout this paper) is the most important predictor of later reading achievement, superceding both phonological awareness and oral language (Hamill, 2004). Emergent literacy interventions should enhance children's understanding of book conventions (i.e., location of the title, front versus back of a book) as well as their knowledge of print directionality and units of written language (Justice et al., 2007). Furthermore, interventions should aim to develop children's understanding of the various functions of print (Schuele et al., 2007). Print awareness is fostered through exposure to literacy artefacts and events, and through participating in book-reading (Kaderavek & Justice, 2004; Katims, 1991; Schuele et al., 2007).

Phonological Awareness. Phonological awareness refers to children's sensitivity to the sound units of speech (i.e. words, syllables, onsets and rimes, phonemes; Kaderavek & Justice, 2004). Researchers (e.g. Cooper, Roth, Speece & Schatschneider, 2002; Metsala, 1999) have demonstrated a strong relationship between preschool oral language skills and phonological awareness abilities, and early skills in phonological awareness have been identified by the National Reading Panel (2000) as one of the top predictors of future reading ability. It is widely accepted that phonological awareness skills are critical for inclusion in emergent literacy interventions for children with language impairments (Gillon & Dodd, 2005; Justice & Schuele, 2004; Justice et al., 2007; Nathan et al., 2004; Schuele et al., 2007; U.S. Department of Education, 2007). For example, skills such as rhyming (Schuele et al., 2007), blending (Justice et al., 2007), and segmenting (Justice et al., 2007; Schuele et al., 2007) should be taught in an intervention

program. Interventions targeting phonological awareness skills should teach these skills explicitly (Justice et al., 2003; O'Connor et al., 1993). These skills may also be addressed through songs, rhymes, games, and books that have a rhyming and/or alliteration component (Schuele et al., 2007).

Meaning-Related Skills

Oral language. Early oral language skills are strongly associated with early code-related skills which promote word-reading abilities, and are also strongly related to later oral language abilities that are used in reading comprehension (Storch & Whitehurst, 2002). In an emergent literacy intervention, children's expressive and receptive vocabulary as well as their grammatical understanding of concepts such as past tense verbs, plural and possessive morphemes, etc., should be targeted for development (Justice et al., 2007). In addition, it is recommended that a narrative component be included in the intervention in order to develop skills in understanding and producing discourse (Justice et al., 2007; Paul & Smith, 1993; Wagner, Sahlen, & Nettelbladt, 1999). Oral language skills such as comprehension and vocabulary growth may be developed through adult-led book reading and discussions (Dickinson & Smith, 1994). Narrative ability can be enhanced through activities which require children to describe objects, actions, etc. or through lessons which require students to think about cause-and-effect or recall events of a story (Kaderavek & Justice, 2004).

Examples of Emergent Literacy Interventions

Very few empirical investigations exist that have examined the effects of an emergent literacy intervention for preschool children with language impairments (Ezell, Justice, & Parsons, 2000; van Kleeck, Vander Woude & Hammett, 2006). At present,

there are no known studies which have investigated a broad, multifaceted emergent literacy intervention with this population, however there are some studies which have targeted one or two emergent literacy skills at a time; these are discussed next.

Most interventions designed to support preschoolers at-risk for reading difficulties have focused on increasing phonological or print awareness (van Kleeck et al., 2006). For example, in an early study, O'Connor et al. (1993) examined the effectiveness of a phonological awareness training program for 47 children, 80% of whom had language impairments. Children were randomly assigned to one of four groups: they were either in the no-treatment control group, or they received training for seven weeks, with four 10-minute sessions per week in blending, segmenting or rhyming. In general, results indicated that children made progress only in the area of phonological awareness in which they were trained.

Similarly, Laing and Espeland (2005) also noted improvements in aspects of phonological awareness that were explicitly trained in preschoolers with communication impairments. After being trained in rhyming and sound categorization skills for 15 minutes, two times per week, children with language impairments made significantly greater gains in these phonological awareness skills than typically developing children who did not receive explicit phonological awareness training.

In another study with preschoolers with language impairments, van Kleeck, Gillam and McFadden (1998) provided phonological awareness training to sixteen children with speech and/or language impairments over a period of nine months. Children received instruction in groups of 3-4, for approximately 10-15min, twice-weekly. The first block of treatment was 12 weeks during the fall semester, and lessons were focused

on rhyming; for the second 12-week block during the spring semester, lessons focused on phoneme awareness. Results suggested that the intervention led to gains in rhyming and phoneme awareness that were not observed in a non-intervention control group.

These results were similar to those achieved by Warrick, Rubin, and Rowe-Walsh (1993) with a kindergarten sample of children with language impairments. Before receiving a phonological awareness intervention with components in syllable awareness, segmenting and rhyming, children with language impairments performed significantly more poorly on most phoneme analysis tasks than typically-developing controls. However, after participating in an 8-week training program with two 20-minute sessions per week, children with language impairments outperformed children with language impairments who did not participate in the intervention, and actually performed similarly to typically-developing children on tasks of phoneme analysis, word-reading and non-word reading.

In addition to these successful phonological awareness interventions, other researchers have designed interventions which have targeted the print awareness and alphabet knowledge of children with language impairments. In a pilot study investigating the effects of a parent-child book-reading program on the print awareness and alphabet knowledge of young children with language and/or phonological disorders, Ezell et al. (2000) found encouraging results. Over five weeks, parents read at least two books with their children, five days per week, while using various strategies to draw children's attention to print concepts and story content. Results revealed that after participating in the treatment, three of the four children experienced significant gains in print awareness, but none of the children experienced improved alphabet knowledge.

Gains in print awareness were similarly observed in a larger study by Justice and Ezell (2002), who examined the impact of print-focused shared storybook reading on increasing print awareness in 30 non-language-impaired preschoolers enrolled in Head Start programs. Children participated in 24 small-group story-book reading sessions over eight weeks. In the intervention group, book-reading interactions were print-focused, where the adult reader used verbal prompting to draw children's attention to print conventions, word concepts, and alphabet knowledge. In contrast, in the control group, shared book-reading sessions were focused on the characters, actions, or perceptual features of the illustrations. Results indicated that the children participating in the print-focused reading sessions had greater gains in performance on tasks assessing print recognition, words in print, and alphabet knowledge from pre- to posttest compared to children participating in the picture-focused sessions.

Combined, the results of the studies discussed above suggest that interventions designed to enhance specific emergent literacy skills of preschoolers at-risk for reading difficulties hold promise. For preschoolers with language impairments, there is a need to develop and investigate the effectiveness of interventions with multiple components that target emergent literacy skills more broadly, aiming to develop multiple domains of emergent literacy simultaneously.

Summary

Current classification criteria used for identifying children with reading difficulties are problematic. Experts have recommended that rather than waiting until children are identified with reading problems during the school years, intervention efforts should be targeted toward preschoolers known to be at-risk for developing reading

difficulties. Preschoolers who struggle with the acquisition of emergent literacy skills are likely among those at-risk.

Emergent literacy is the knowledge about reading and writing that children acquire prior to receiving formal reading instruction in school. Emergent literacy knowledge and skills lay the foundation for later reading development, and difficulties in emergent literacy skill acquisition are predictive of later reading difficulties. Research suggests that preschoolers with language impairments tend to have difficulties in acquiring emergent literacy skills, and often have poor reading achievement throughout elementary school and into adolescence.

Intervention is key in preventing these literacy-related difficulties, and should begin as early as possible. Emergent literacy skills can be developed through enhancements to typical language therapy provided to children with language impairments by their speech-language pathologists. These interventions should combine embedded literacy activities, where emergent literacy skills are developed through informal, naturalistic activities such as shared book-reading; and explicit literacy activities, where emergent literacy skills are taught in a structured, systematic manner. Research has identified four domains of emergent literacy that are critical for inclusion in an intervention for preschoolers with language impairments, including code-related skills such as alphabet knowledge, print awareness and phonological awareness, and meaning-related skills such as oral language skills in vocabulary and narrative abilities. A small number of studies have demonstrated success in targeting one of these skills with preschoolers with language impairments, however there are no known investigations of

interventions which have targeted multiple domains of emergent literacy; researchers have emphasized the need for such an intervention.

The Present Study

The present study is concerned with examining the construct of emergent literacy and investigating the effectiveness of a multi-faceted emergent literacy intervention aimed at addressing multiple domains of emergent literacy simultaneously in preschoolers with language impairments. Two categories of research questions have emerged for investigation:

RQ1: What is the nature of the relationship between children's early skills in written language awareness, phonological awareness, and oral language?

As discussed previously, there is some uncertainty as to precisely which skills should be considered to comprise the construct of emergent literacy. In this study, I will empirically explore the relationship among children's early skills in written language awareness, phonological awareness, and oral language in an attempt to clarify whether it is useful to make distinctions among these skills, or whether all of these early skills can be seen to represent one broad construct that can be termed 'emergent literacy'.

RQ2: a) For preschoolers with language impairments, will an emergent-literacy-enhanced language intervention result in more significant improvements in early reading and language skills than traditional language therapy?

RQ2: b) Will the intervention impact children with severe and non-severe language impairments differently?

RQ2: c) If there are gains observed in children's early reading and language skills after participating in language therapy, are these gains clinically significant?

Researchers and clinicians concerned with supporting preschoolers with language impairments have acknowledged the need to support these children in developing emergent literacy skills. Previous research has indicated that training programs designed to increase skills in a particular aspect of emergent literacy is possible with preschoolers with language impairments. For this reason, I expect that a multi-faceted intervention which broadly targets various domains of emergent literacy will be more effective than traditional language therapy which does not target emergent literacy skills. Furthermore, given the close link that has been demonstrated between emergent literacy and oral language development, I hypothesize that an intervention which targets both emergent literacy and language goals simultaneously may be more effective in improving oral language skills than an intervention which addresses language goals alone.

In understanding the effectiveness of the intervention, it will also be interesting to compare how children with severe and non-severe language impairments respond to the two intervention approaches. Considering the findings of previous research which has indicated that children with more severe language impairments are at greater risk of later reading problems (Catts et al., 2002) and may not experience great gains in emergent literacy development after participating in an emergent literacy intervention (Justice et al., 2003), it is important to explore whether or not the experimental intervention being investigated in the current study has an impact on children with the most severe impairments.

Finally, given the applied nature of this study and its possible implications for influencing the treatment received by hundreds of preschoolers at Speech Services Niagara each year, it is also important to understand the clinical significance of the

results observed in this study. In other words, regardless of whether the results are statistically significant, I am interested in examining whether any of the emergent literacy gains achieved by children in this study after participating in language therapy are significant when considering established benchmarks from the measures used in this study.

CHAPTER 3

Method

Overview

The current study has two objectives. The first is to explore the nature of the relationship between children's early language and literacy skills in an attempt to better understand how to conceptualize children's emergent literacy abilities. The second, primary objective of this study is to investigate the effects of a multi-faceted intervention designed to promote a broad range of skills which contribute to the development of emergent literacy abilities. Specifically, the study compares two intervention approaches – an experimental emergent literacy intervention and a standard intervention based on traditional models of speech and language therapy. It was hypothesized that the emergent literacy approach would result in significant gains in written language and phonological awareness skills, as well as oral language skills relative to a less structured standard intervention approach.

Participants

The children who participated in this study came from a population of approximately 1900 2- to 5-year old children who were referred to Speech Services Niagara and the Niagara Preschool Speech, Language and Literacy System by their parents or paediatrician because of concerns about their speech and/or language development. After being referred to Speech Services Niagara, children underwent a screening assessment by a speech-language pathologist to determine whether they had a delay in speech or language which qualified them as eligible for speech-language therapy. Preschool children who were between the ages of 3 to 4.75 years of age and who

were deemed eligible for speech-language therapy by the speech-language pathologist because of a significant delay in *language* development were invited to participate in a larger longitudinal study which will investigate aspects of children's language and literacy development over the course of two years. From the eligible population of preschoolers, a sample of 55 children was secured for participation in the larger study; these children also serve as the sample in the current study, as described below. Children with low incidence disabilities such as autism or intellectual disabilities, and children with significant ESL difficulties were not included as participants. Participating children were from a primarily middle-class suburban area in Southern Ontario.

Research Question 1

Fifty-five preschool children born in 2002 participated in the first component of this study, in which the nature of children's emergent literacy abilities was empirically investigated. Of the 55 children participating in the current study there were 44 boys and 11 girls. Participants were between the ages of 37 and 56 months at their first assessment session with a sample mean age of 49 months. All children participating in this study were identified as language impaired as defined by their performance on the Clinical Evaluation of Language Fundamentals –Preschool - Second Edition (CELF-P2), while also taking into consideration clinical judgment and additional testing. The CELF-P2 is a clinical tool for identifying and diagnosing language deficits in children ages 3 – 6 years (Wiig, Secord & Semel, 2004). Children who scored at or below the 34th percentile on the CELF-P2 and who were deemed eligible for language therapy by their speech-language

pathologist were considered to have language impairments and were included in this study.¹

Research Question 2

The second research question was concerned with comparing the effects of the experimental literacy-enhanced language intervention with the traditional language therapy. Thirty-eight (19 from the experimental group and 19 from the control group) of the original 55 children were included in the second part of the study, which required children's scores at both Time 1 (before treatment) and Time 2 (after treatment) for analyses. The sample size decreased from the original group of participants for several reasons: two children (both from the experimental group) withdrew from the study before treatment even began; three children (two from the control group and one from the experimental group) were discharged from therapy due to poor attendance issues as per Speech Services Niagara policies (e.g. they had missed more than two sessions without providing notice of cancellation); nine children (five from the experimental group and four from the control group) dropped out of the study and/or therapy during the course of the treatment; one child (from the control group) was discharged as per SSN policies because she began Kindergarten during the course of her treatment; one child (from the experimental group) did not show up for follow-up testing despite numerous attempts to contact his family; and one child (from the experimental group), although classified as language-impaired according to the CELF-P2 guidelines (he achieved a Core Language

¹ Children who fall below the 16th percentile on the Core Language Index of the CELF-P2 are considered to have below-average language abilities (Wiig et al., 2004). Although children who score above the 16th percentile may sometimes be considered to have average language abilities, if other factors – such as clinical judgment – suggest a reason for concern, a child may still be considered to have deficient language abilities that require intervention. In our sample, we included children who scored above the 16th percentile on the CELF-P2 if, based on clinical judgement and additional testing with Speech Services Niagara measures, they were deemed eligible for language therapy.

Score corresponding to the 5th percentile), did not meet SSN requirements for language therapy according to the clinician's judgment and additional testing protocol used by Speech Services Niagara to determine eligibility for treatment.

Attrition Analysis

In examining the decrease in sample size from the initial testing to the follow-up testing, the attrition rate in this study was 30.9%. At the time of the original testing, there were 55 participants; by Time 2, this number had dropped to 38, for the reasons outlined above. See Table 1 for characteristics of the sample used for both of the research questions in this study.

In order to understand the impact of attrition on the representativeness of the sample which remained at Time 2, children who were no longer participating in the study at Time 2 were compared with children who remained in the study on all Time 1 measures. On the PALS-Pre-K Print & Word Awareness task, the children who were no longer participating in the study scored higher, on average ($M = 4.12$) than those who remained in the study ($M = 2.5$); this result was statistically significant ($t = -2.63, p < .05$). No other between-group differences emerged on any of the Time 1 measures (see Table 2) when investigating the sample as a whole. When I further explored the impact of attrition within the control group and within the experimental group, similar results were observed: the only significant difference between children who remained in the study and those who were no longer in the study at Time 2 was on the Print & Word Awareness task for children in the control group. In general, the children who remained in the study at Time 2 were not different from those who were no longer participating.

Table 1

Characteristics of the Participants Used in RQ1 and RQ2

	Intervention Group (Randomly Assigned)		Sex		Age (in months)	Cognitive Ability (AGSESP)	CELF Core Language Score
	Experimental	Control	Girls	Boys	<i>M(SD)</i>		
RQ1 Sample (<i>n</i> = 55)	26	29	11	44	49.14 (3.71)	101.58 (11.66)	81.96(11.48)
RQ 2 Sample (<i>n</i> = 38)	19	19	9	29	48.92(3.34)	100.84(11.72)	81.03(10.68)

Table 2

Means and Standard Deviations on All Time 1 Measures for Children Who Were No Longer Participating at Time 2 and Children Who Remained in the Study at Time 2

	Children no longer participating at Time 2	Children who remained in the study at Time 2	<i>t</i>	<i>p</i>
Age	50.50(3.03)	48.63(3.85)	-1.63	0.11
Cognitive Ability (AGSESP)	104.36(10.98)	100.76(11.87)	-0.90	0.37
CELF Core Language Score	85.21(13.26)	80.73(10.67)	-1.25	0.22
PALS Upper-Case Letter	6.76(8.61)	3.82(5.37)	-1.30	0.21
PALS Print & Word	4.12(2.20)	2.50(2.06)	-2.63	0.01
PALS Beginning Sounds	2.65(3.01)	1.66(2.03)	-1.23	0.23
PALS Rhyme Awareness	3.18(2.77)	1.97(1.91)	-1.63	0.12

Measures

The measures in this study included three covariates, which were variables chosen based on their relationship with children's language and literacy abilities; one measure of oral language ability which was used to identify children with language impairments for participation in this study and to differentiate between children with severe and non-severe language impairments, and which also acted as one of the dependent variables; and four measures of early literacy, which acted as dependent variables in this study.

Covariates

Three variables were treated as covariates in this study in order to account for the contribution of each variable to children's scores on the dependent measures. Sex, age, and cognitive ability were chosen as covariates based on their suspected relationship with the dependent measures. These measures are discussed below. In addition, children's Time 1 test scores on the dependent measures (language and early literacy measures) were entered as covariates in the Time 2 analyses, as discussed later.

Sex. Children's sex (male/female) was included as a covariate in order to statistically control for sex differences in children's language and early literacy scores. In preschool-age children, boys have been shown to have weaker language (Silva, Williams & McGee, 1987) and literacy (Strand, 1999) abilities than girls.

Age. Children's age in months was measured at the time of testing. Previous research has indicated that children's age may impact their initial response to an emergent literacy intervention (Whitehurst et al., 1999).

Cognitive Ability. Children's cognitive ability was treated as a covariate in this study in order to control for any cognitive differences which may impact children's

language or literacy skills or their capacity to acquire these skills. Cognitive abilities were assessed using the AGS Early Screening Profiles (AGSESP), a tool used to screen children for a variety of possible handicaps (Harrison, 1990). The Cognitive Profile of the AGSESP was used in this study to acquire an overall measurement of children's cognitive ability. The Cognitive Profile consists of two subtests which assess children's nonverbal reasoning abilities: Visual Discrimination and Logical Relations. In the Visual Discrimination task, the child is presented with one stimulus image, and must select, from several other images, the image(s) which matches the stimulus. In the Logical Relations task, the child must solve visual analogies and point to images which correspond logically to the stimulus image.

THE AGSESP was standardized in the United States with a representative national sample of 1149 children aged 2 years 0 months through 6 years 11 months. Using Cronbach's coefficient alpha, the internal consistency of the Cognitive Profile is $\alpha = .86$ for the age groups included within our sample (Harrison, 1990).

Language Measures

Assessments of children's oral language were used to determine eligibility for participation in the study and also acted as a dependent variable in order to measure the effectiveness of the interventions on children's language ability. Children's performance on the CELF-P2 was used as a measurement of their oral language ability. The CELF-P2 was administered individually to all children by a registered speech-language pathologist. As discussed previously, language impairments were defined by a Core Language Score corresponding to the 34th percentile or below on the CELF-P2. The Core Language Score is a measure of general language ability that quantifies a child's overall language

performance. It is calculated by summing the Sentence Structure, Word Structure, and Expressive Vocabulary subtests of the CELF-P2, which are described below. Using Cronbach's coefficient alpha, the internal consistency of the Core Language Score ranges from $\alpha = .90$ to $\alpha = .93$ for the age groups included within our sample (Wiig et al., 2004). Norm-referenced data was obtained through the standardization of the CELF-P2 with a sample of over 1150 children in the United States.

Sentence Structure Subtest. The Sentence Structure subtest measures children's ability to interpret spoken sentences that increase in length and complexity.

Word Structure Subtest. The Word Structure task measures children's morphological skills. These skills are demonstrated through the child's ability to apply word structure rules to extend word meanings by adding suffixes; to derive new words from base words; and to correctly use referential pronouns.

Expressive Vocabulary Subtest. The Expressive Vocabulary subtest evaluates the child's ability to use nouns and verbs for referential naming of people, objects and actions depicted in illustrations.

Early Literacy Measures

A primary objective of the current study was to determine the effectiveness of the experimental literacy-enhanced language intervention in improving children's early literacy abilities. As such, several measures of children's pre-reading skills served as dependent variables; these skills were assessed with four subtests of the PALS-Pre-K. Based on previous literature, Justice et al. (2002) recommended several areas of emergent literacy which – according to their demonstrated value in predicting later reading achievement – should be targeted in an early literacy screening protocol for children with

speech and/or language impairments: letter-name knowledge; print awareness, and phonological awareness. In the present study, the PALS-Pre-K instrument (Invernizzi, Sullivan & Meier, 2001) was selected as a measure of children's early literacy because it is comprised of subtests which measure children's abilities in each of these areas, and because it is one of very few instruments that have been designed specifically for screening early literacy skills (Justice et al., 2002).

The PALS-PreK instrument (Invernizzi et al., 2001) is a screening tool that measures preschoolers' developing knowledge of important literacy fundamentals and offers guidelines to teachers for tailoring instruction to children's specific needs. The assessment reflects skills that are predictive of future reading success and difficulties (Invernizzi et al., 2001). The specific subtests of the PALS-PreK used in this study include the Upper-Case Letter Identification task, the Print & Word Awareness task, the Beginning Sounds Awareness task, and the Rhyme Awareness task; these are described below. For the purpose of this study, the Upper-Case Letter Identification and Print & Word Awareness tasks are treated as measures of the skill termed 'written language awareness', as these tasks assess children's knowledge of the alphabet and important print concepts (Invernizzi et al., 2001); these abilities are thought to be important components of written language awareness (e.g., Sénéchal et al., 2001). The Beginning Sounds and Rhyme Awareness tasks are classified as measures of 'phonological awareness', as these tasks assess children's ability to understand and manipulate words at the phoneme level (Invernizzi et al., 2001), which is an important component of children's phonological awareness (e.g., Invernizzi et al., 2001; Sénéchal et al., 2001).

Upper-Case Letter Identification. This subtest is a measure of alphabet knowledge, a component of written language awareness. In this subtest children were shown all twenty-six upper-case letters of the English alphabet in random order and asked to give the letter name. Responses were scored as correct if they corresponded with the appropriate letter name.

Print and Word Awareness. This subtest is a measure of print knowledge, a component of written language awareness. In this subtest the examiner read a familiar nursery rhyme printed in a book format and asked the child to point to different components. In this natural book-reading context children demonstrated their awareness of print concepts such as directionality and the difference between pictures, letters, and words. This subtest consisted of 10 test items.

Beginning Sound Awareness. This subtest measures skills in phonological awareness. In this subtest the examiner said the name of a picture and asked the child to produce the beginning sounds (phonemes) for words that start with /s/, /m/, and /b/. There were 10 test items.

Rhyme Awareness. This subtest is another measure of phonological awareness. In this subtest the examiner showed the child pictures and named each picture. The examiner then asked the child to point to the picture that rhymes with the first one. This subtest consisted of 10 test items.

The PALS-PreK measure was piloted with 663 preschoolers in Virginia over the course of 4 years. Cronbach's alpha for internal consistency range from $\alpha = .75$ to $\alpha = .93$ on the subtests selected for use in this study (Invernizzi et al., 2001).

Procedure

Design

A between-groups pre-test - posttest design exploring two intervention programs served as the framework for this study. After being identified with a language impairment according to their performance on the CELF-P2, children were invited to participate in the study (see Appendix A for the information/consent form used in recruitment). As children entered the study, they were randomly assigned to either the experimental or standard intervention group. Before receiving their respective intervention, all children were assessed with pre-test measures from the PALS-PreK. Scores achieved at this time on the CELF-P2 and PALS-Pre-K were used to address RQ1 and were used as covariates in analyses for RQ2.

Following group assignment and pre-testing, children completed a 12-week intervention period. Children participated in this intervention for 45 minutes each week over the course of 12 weeks. Children worked individually with their assigned speech-language pathologist. A total of 10 speech-language pathologists participated in the study and each was assigned approximately an equal number of children receiving the experimental and standard intervention. For example, one speech-language pathologist worked individually with two children who were given the experimental therapy regime, and worked individually with another two children who received the standard therapy regime. It was important therefore that each participating speech-language pathologist was knowledgeable of both intervention approaches. To ensure this, all speech-language pathologists participated in intensive training for each of the intervention approaches. Furthermore, as suggested by Troia (1999) therapy sessions were randomly videotaped

and evaluated by the primary investigators to ensure continuity within each approach (e.g., experimental sessions included 2 literacy targets per session and one book per session; control sessions did not include print, books, or explicit teaching of literacy targets). However, it is recognized that with the applied nature of this research, threats to internal validity and external reliability were inherently present; these issues are addressed in the concluding section on study limitations.

After completing this first 12-week block of therapy, children took a 12-week rest, where no formal intervention was provided by their speech-language pathologist at the speech-language centre. During this time, families continued a personalized home program designed to address the child's individual language goals in a similar manner to the weekly homework sessions described later. After this rest period, all children returned to Speech Services Niagara, at which time their language and emergent literacy skills were again assessed with the CELF-P2 and the PALS-PreK, by a speech-language pathologist who was blind to the child's group assignment (experimental or control).

Intervention

Both the experimental and standard intervention program consisted of 12 sessions held once per week for approximately 45 minutes. All sessions were held in small private rooms at one of six Speech Services Niagara sites and were conducted by a registered speech-language pathologist. Each speech-language pathologist has graduate level training in intervention principles for working with children with speech and language impairments, and is regulated by the College of Audiologists and Speech-Language Pathologists of Ontario. For the duration of the intervention period, children's parents, caregivers, and educators were blind to the study's design. Regardless of the type of

intervention received, it is important to note that each intervention session was designed to address children's individual language needs, as identified by the child's speech-language pathologist through initial language assessments.

Experimental Intervention Program. The experimental intervention program used in the study included an adaptation of a published program called *Read It Again!* Language and Literacy Supplement for Preschool Programs, designed by Justice et al. (2006). *Read It Again!* was designed to build children's language and literacy competencies in four areas transcending both emergent literacy and oral language: print knowledge, phonological awareness, vocabulary and narrative. These four areas encompass both the code-related and meaning-related skills that were previously discussed to be important in providing a foundation for later reading proficiency. Justice et al. (2006) write that early difficulties in any one of these areas can undermine this early foundation and set the stage for a host of ongoing challenges that become more difficult to remediate over time. The current study's experimental intervention included the four areas of focus from the *Read It Again!* Program (Justice et al., 2006): print knowledge (otherwise referred to as 'written language awareness' throughout this paper), phonological awareness, vocabulary, and narrative; as well as the activities and books involved in their facilitation (Please refer to the *Read It Again!* manual for complete details).²

² Although all four components of the *Read It Again!* program were incorporated into the experimental intervention used in the current study, only three of these skill areas were explicitly measured and thus available for statistical analyses in this study. While print knowledge, phonological awareness and vocabulary were measured explicitly at each time-point with subtests of the PALS-Pre-K and the CELF-P2, narrative abilities are not precisely measured with either of these tools (although narrative abilities are thought to encompass a broad range of oral language skills which are measured by the CELF-P2). The current study is part of a larger longitudinal study, where children are followed up to grade one, at which time they will undergo numerous assessments of their reading ability and their language skills, including their narrative abilities.

For the purposes of this study, the print knowledge component of the intervention was aimed at facilitating children's understanding of the purpose of print; their understanding of left-to-right directionality; and their ability to name the various units of print (letter, word, sentence) and identify general book concepts (author, title, front). In addition, contained within the print knowledge component of the intervention was the second important aspect of written language awareness: alphabet knowledge. Specifically, speech-language pathologists worked with children to develop their ability to identify upper-case letters, particularly those letters in the child's own name. In the intervention, print knowledge was often facilitated with the use of books (i.e. having the child identify a word or a sentence on a page).

In the current study, multiple aspects of phonological awareness were addressed by speech-language pathologists through the experimental intervention. Through a combination of explicit teaching and a variety of games and activities which provided ample opportunity for practice (i.e. rhyming games, clapping out syllables, etc.), children developed skills in rhyming, segmenting and blending syllables, elision, and letter-sound correspondence.

Within this study, several main aspects of vocabulary were targeted in the experimental intervention: developing children's understanding of, and ability to use new nouns and verbs; descriptive words; colour names and number words; and prepositions and sequencing words. New words came out of storybooks that were shared during the session. Children were explicitly taught the meanings of the words, and then were encouraged to use the new words while participating in a variety of games and activities.

For the purpose of this study, narrative skills were usually developed within the context of a shared storybook. During and after a story, children's narrative abilities were facilitated by the speech-language pathologist who prompted the child to discuss the story's characters, setting and plot in a clear, precise manner.

During each therapy session, the speech-language pathologist focused on two of these four objectives for the first 15 minutes of the 45 minute session. During this time, the speech-language pathologist read a book with the child and engaged the child in various exercises designed to meet the literacy objectives. These exercises were standardized across all children participating in the experimental group, and were explicitly outlined in the intervention manual provided to each speech-language pathologist (see Appendix B for a sample lesson plan that was followed for one therapy session). The remaining 30 minutes were spent focusing on the child's specific language-goals as identified in the intake screening session (see Appendix C for an example of a typical language therapy session for both the experimental and control groups, where the child's language goals are the same in both instances). However, to remain consistent with the broad objective of the experimental intervention design, the focus on language goals was embedded within an emergent literacy framework. For instance, the material used to elicit language targets was embedded within print. Furthermore, activities used to address the language goals were typically focused around a theme relevant to the literacy activities worked on at the start of the session (i.e., if Chicka Chicka Boom Boom was the story being used in the literacy regime on a particular day, that day's language activities may have been based around a coconut theme, since there is a coconut tree in the story).

See Appendix D for an outline of the book titles, learning domains and literacy objectives focused on during each session of the 12 weeks of therapy.

Standard Intervention Program. Traditionally, preschool language interventions provided to children with language impairments at Speech Services Niagara have been based on eclectic approaches that included repetition-and-practice activities aimed at improving children's receptive and expressive language needs. However, standard interventions have not typically embedded within literacy-based activities but rather the focus has been on eliciting the targets within a communicative interaction with no explicit emergent literacy targets. Within the standard intervention approach, a speech-language pathologist responded to specific language-based needs of children (e.g., using negation correctly; using plurality correctly; following one- and two-step directions; improving children's mean length of utterance (MLU), etc.) and structured therapy activities accordingly. For instance, to meet a child's specific need with expressive vocabulary, a speech-language pathologist may have explicitly modelled the correct use of auxiliary verbs (e.g., using "is"/"are" with verbs). The therapist may have modelled the sentence by emphasizing the auxiliary verb (e.g., "he *is* walking") and showing a corresponding picture or object. The therapist may have then involved the child in a game or activity where the child could practice using the auxiliary verb while playing the game or describing components of the game. Unlike in the experimental intervention, these practice games/activities were done without the use of books or literacy-related artefacts. In other words, compared to the literacy-enhanced experimental intervention, the standard intervention approach did not have a structured focus on emergent literacy objectives. Written language and phonological awareness skills were not targeted either

explicitly through direct teaching or indirectly through any of the games or activities (See Appendix E for a checklist of activities that might be selected for a traditional therapy session for a child in the control group; see Appendix C for an example of a typical language therapy session for both the experimental and control groups, where the child's language goals are the same in both instances).

Weekly homework was assigned to both groups. Homework for the experimental intervention group included a standardized literacy component (e.g., see Appendix F for examples) which targeted one of the two literacy objectives that were the focus of that day's session, as well as individualized activities designed to target the child's personal language goals. For these families, books, puzzles, games, etc. were offered for loan from Speech Services Niagara so that the families could complete the homework. Families in the control group also received individualized homework assignments that were particular to the child's unique language targets, however the homework for these children did not include any emergent literacy concepts. Puzzles and games were offered for loan from Speech Services Niagara so that the families could complete the homework. See Appendix C for an example of typical homework that might be assigned to children in the experimental or control groups after their language therapy session.

CHAPTER 4

Results

This chapter reports the results of the various analyses used to address the research questions of interest in this study. The chapter is separated into two sets of analyses. The first set of analyses is designed to address RQ1 by providing an exploration of the relationship among children's early abilities in a variety of areas. These analyses include correlational analyses and a hierarchical factor analysis. To address RQ2, the second set of analyses is concerned with exploring the effect of the experimental literacy-enhanced language intervention in comparison to the traditional language therapy received by the control group. Several ANCOVAs are used to investigate the impact of the intervention on the early literacy and language abilities of the children in the study, and to explore how the intervention may differentially impact subgroups of children within the sample.

Part 1 – Exploring the Relationship Among Children's Early Literacy and Language Abilities

The first research question in this thesis was concerned with exploring the relationship between children's early skills in written language awareness, phonological awareness and oral language. To explore these relationships, correlational analyses and a hierarchical factor analysis were used. As discussed in Chapter 3, in these analyses, the PALS-Pre-K Upper Case Letter Identification and Print and Word Awareness tasks were used as a measure of children's written language awareness; the PALS-Pre-K Beginning Sounds Awareness and Rhyme Awareness tasks were used as measures of phonological awareness; and scores on the CELF Core Language Score represented children's oral

language ability. In the correlational analyses, as expected, all of the variables were significantly and positively correlated with all other variables (see Table 3). Correlations ranged from .35 to .67, with the majority falling within the “moderate” range (Cohen, 1988). This is not surprising given that PALS-Pre-K measure is comprised of tasks that are highly interrelated and which are thought to be a part of one underlying construct known as emergent literacy (Invernizzi et al., 2004), and considering the known relationship between language and emergent literacy development (Schuele et al., 2007). Print and Word Awareness was the variable which correlated most highly with the other variables. The importance of these high, positive correlations will become clearer after investigating the data via factor analysis procedures.

Table 3

Means, Standard Deviations, and Bivariate Correlations for All Variables at Time 1

	M (SD)	1.	2.	3.	4.	5.
1. Upper Case Letter Identification	4.85 (6.55)	1.00				
2. Print & Word Awareness	3.42 (2.35)	.67***	1.00			
3. Beginning Sounds Awareness	2.18 (2.52)	.36*	.56***	1.00		
4. Rhyme Awareness	2.74(2.68)	.35**	.39**	.40***	1.00	
5. CELF Core Language Score	85.35(13.32)	.35*	.50***	.37**	.49***	1.00

*p<.05

**p<.01

***p<.001

Following the correlational analyses, children's scores on each of the PALS-Pre-K measures and the CELF measure were entered into a hierarchical factor analysis. In general, factor analysis (FA) is helpful in understanding the relationships among variables. FA can be used to test a theory about the number and the nature of the factors that may explain the variables, and to understand any underlying processes that might exist or be used to summarize the pattern of correlations among variables (Tabachnick & Fidell, 1996). In the current study, FA was first used to test a three-factor theoretical model, wherein – based on previous literature – written language awareness, phonological awareness and oral language were expected to emerge as three distinct factors. The three factors that were extracted from this analysis were then treated as 'first-order factors' and entered into a second factor analysis to examine how many 'second-order' factors could be used to explain the three-factor theoretical model that was specified in the first analysis. In other words, I was interested in exploring the possibility that the three factors that emerge when a three-factor model is specified, might actually be further understood as components of one broad construct or underlying process.

Prior to the analyses, data was screened using various SPSS procedures for missing data and possible outliers; to ensure the assumptions of normality, linearity and non-multicollinearity were met; and to examine the factorability of the correlation matrices. Two variables (the PALS-Pre-K Upper Case Letter Identification and Beginning Sounds Awareness tasks) were found to be positively skewed. This was not surprising, given the clinical nature of the sample and the expectation that preschoolers with language impairments may be lacking knowledge of important emergent literacy concepts.

A factor analysis was performed using five variables, with a sample of 55 preschoolers with language impairments. A three-factor model with an oblique (Oblimin) rotation was requested. The first factor that was extracted had an eigenvalue of 2.92 and accounted for 58.43% of the variance in the data. The PALS-Pre-K Upper Case Letter Identification and PALS-Pre-K Print & Word Awareness variables loaded highly on this factor (see Table 4), and therefore this factor was interpreted as “written language awareness”. The second factor had an eigenvalue of 0.74 and accounted for an additional 14.87% of the variance in the data. The CELF Core Language Score loaded highly on this factor (see Table 4); the factor was interpreted as “oral language”. The third factor had an eigenvalue of 0.56 and accounted for an additional 11% of the variance in the data. As the PALS-Pre-K Beginning Sound Awareness and Rhyme Awareness tasks loaded highly on this factor (see Table 4), the factor was interpreted as “phonological awareness”. These results confirmed the hypothesized three-factor model, wherein the two measures which were considered to be components of “written language awareness” did in fact load highly together on one factor, which was distinct from both the factor which included the measure of oral language ability and the factor which included the two measures which were considered to be components of “phonological awareness”. Also not surprising, is that the three factors were positively correlated with one another, with correlations ranging from .27 - .48 (see Table 5); therefore, the three factors, although certainly distinguishable as separate constructs, were also interrelated.

Table 4

Factor Loadings for all Variables in the Three-Factor Theoretical Model

	Factor 1 (Written Language Awareness)	Factor 2 (Oral Language)	Factor 3 (Phonological Awareness)
PALS-Pre-K Upper Case Letter Identification	0.94	-0.00	-0.02
PALS-Pre-K Print & Word Awareness	0.74	0.20	0.14
PALS-Pre-K Beginning Sounds Awareness	0.24	-0.20	0.84
PALS-Pre-K Rhyme Awareness	-0.12	0.42	0.71
CELF Core Language Score	0.18	0.89	-0.01

Table 5

Correlations Between First-Order Factors from the Three-Factor Theoretical Model

	Factor 1	Factor 2	Factor 3
Factor 1: Written Language Awareness	1.00		
Factor 2: Oral Language	0.27	1.00	
Factor 3: Phonological Awareness	0.48	0.36	1.00

After understanding that children's skills in written language awareness, phonological awareness and oral language emerge as distinct factors, my next goal was to determine whether these three factors might be explained by one broad construct, which could be interpreted as "emergent literacy". Factor scores were retained from the three-step model and were entered as "first-order factors" into a factor analysis which specified that only factors with an eigenvalue greater than one should be extracted. Only one "second-order factor" emerged, and analysis of the Scree plot confirmed a clear single-factor structure: this factor – interpreted to represent 'emergent literacy' – had an eigenvalue of 1.74, and accounted for 58% of the variance in the data. As seen in Table 6, this second-order factor was well-defined by the first-order factors, with all first-order factors loading onto the second-order factor at a level of .68 or greater.

Table 6

First-Order Factor Loadings on the Second-Order Factor

	Factor Loadings on the Second-Order Factor
Factor 1: Written Language Awareness	.78
Factor 2: Oral Language	.68
Factor 3: Phonological Awareness	.83

The entire hierarchical model with the relationships between the first-order factors and second-order factor is illustrated in Figure 1. Taken together with the results of the correlational analyses, the results of the hierarchical factor analysis indicate that children's abilities in written language awareness, phonological awareness, and oral language are separate but interrelated constructs which can be thought of as sub-constructs of one broad construct termed 'emergent literacy'.

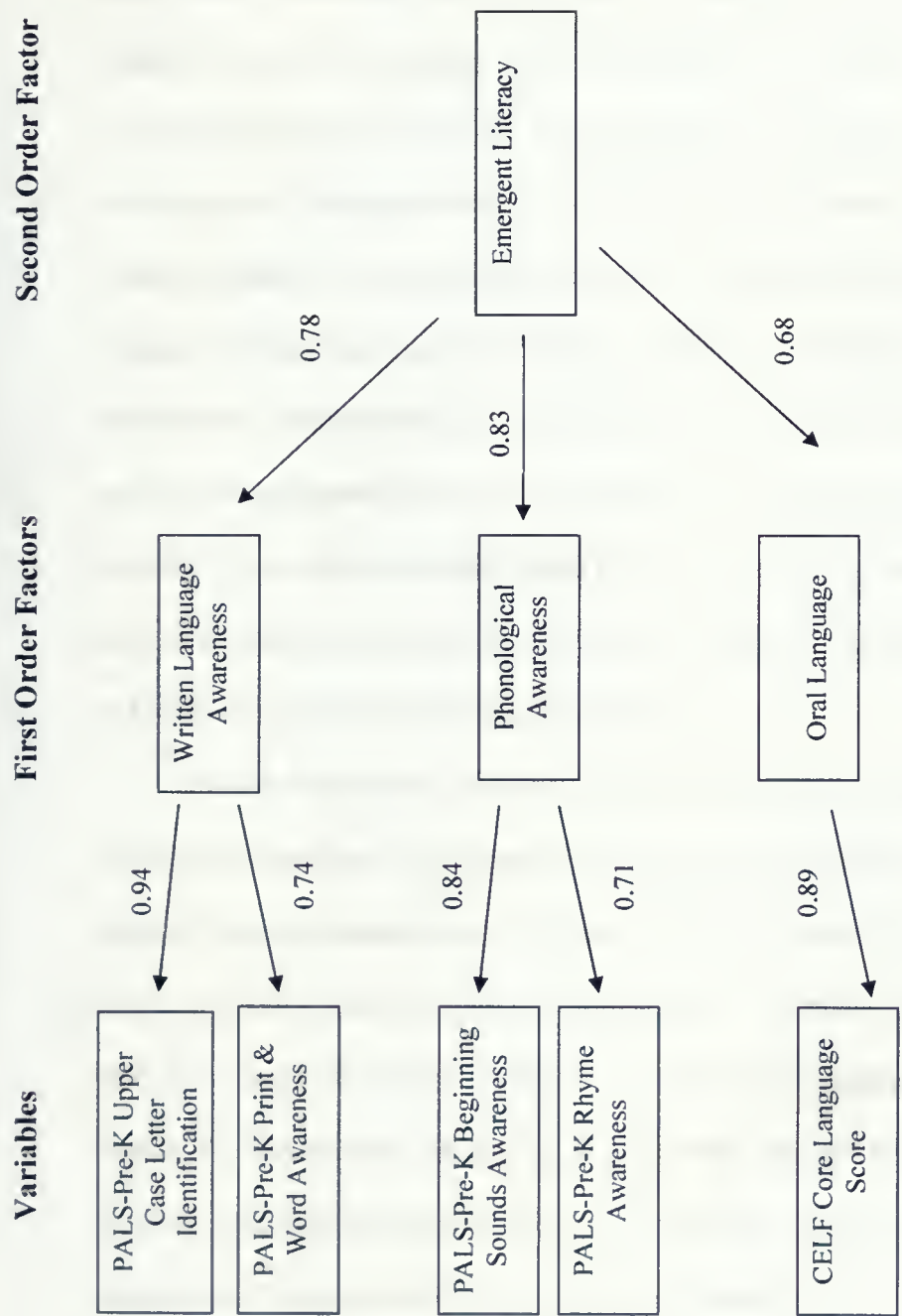


Figure 1. Hierarchical factor analysis model.

Part 2 – Exploring the Effects of the Experimental Intervention

A second objective of this thesis was to examine the effectiveness of a literacy-enhanced language intervention in improving children's emergent literacy abilities. Specifically, I was interested in comparing the experimental intervention with traditional language intervention typically received by children with language impairments at SSN. To accomplish this task, ANCOVA procedures were used in SPSS to investigate between-group differences between children in the experimental group who received the literacy-enhanced therapy, and children in the control group who received the traditional therapy. Children's sex, age and cognitive ability as well as their time one (T1) scores on each measure were entered as covariates. The practice of controlling for participants' T1 scores is often adopted in a pre-test – posttest experimental design in order to diminish the effect of any individual differences within and between groups that may have existed prior to the intervention despite the random assignment of children to the experimental and control conditions (Tabachnick & Fidell, 1996).

Prior to the analyses, data was screened using various SPSS procedures for missing data and possible outliers, and to ensure the assumptions of linearity, non-multicollinearity, homogeneity of variance, and homogeneity of regression were met. A between-subjects analysis of covariance was then performed on time two (T2) scores on each of the four PALS-Pre-K early literacy measures (Upper Case Letter Identification, Print & Word Awareness, Beginning Sounds Awareness and Rhyme Awareness) and on the Core Language Score of the CELF for 38 children. Group status (control and experimental) was entered as the independent variable ($n_{\text{control}} = 19$; $n_{\text{experimental}} = 19$). Covariates were sex, age, cognitive ability, and scores at T1. Raw means and standard

deviations can be seen in Table 7, however for the purpose of the discussion of results, reference will be made to the estimated marginal means, as these have been adjusted appropriately to account for the covariates. The marginal means are also found in Table 7.

Table 7

Time 1 Descriptives and ANCOVA Results Comparing Control and Experimental Groups at Time 2

	Control			Experimental			η_p^2	F	p
	T1 $M(SD)$	T2 $M(SD)$	Estimated Marginal Mean (SE)	T1 $M(SD)$	T2 $M(SD)$	Estimated Marginal Mean (SE)			
Upper Case Letter	4.89(6.44)	11.95(8.39)	11.06(1.65)	3.53(5.99)	14.84(9.73)	15.73(1.65)	0.11	3.94	0.06
Print & Word Awareness	2.63(2.36)	5.61(2.71)	5.48(0.42)	2.58 (1.95)	6.74(1.73)	6.89(0.42)	0.15	5.70	0.02
Beginning Sounds Awareness	1.95(2.22)	4.74(3.87)	4.34(0.74)	1.47(2.20)	5.26(4.39)	5.66(0.74)	0.05	1.56	0.22
Rhyme Awareness	2.26(2.35)	4.53(2.95)	4.33(0.50)	1.89(1.52)	4.42(2.32)	4.62(0.50)	0.00	0.16	0.70
CELF Total Language Score	80.16(11.08)	91.79(11.07)	92.03(1.75)	81.89(10.49)	90.42(12.11)	90.18(1.75)	0.02	0.55	0.46

It was hypothesized that children in the experimental group would perform better at T2 than children in the control group. This was in fact the case: the mean scores on each of the early PALS-Pre-K tasks (but not the language measure) were always higher for children in the experimental group compared to those in the control group (see Figures 2 and 3).

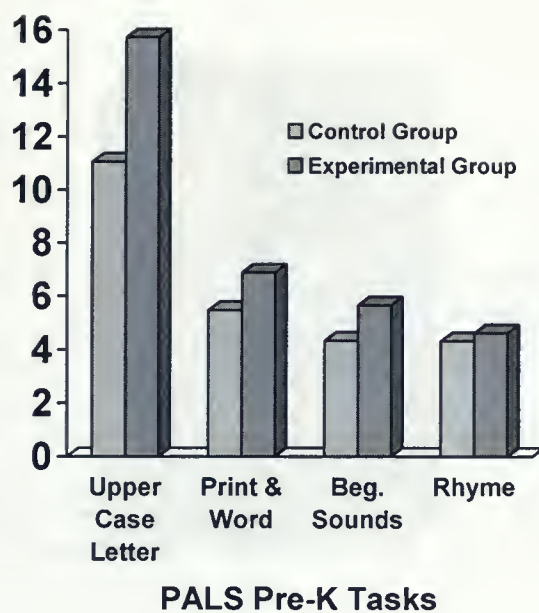


Figure 2. Control and experimental group marginal means for all PALS-Pre-K tasks at T2.

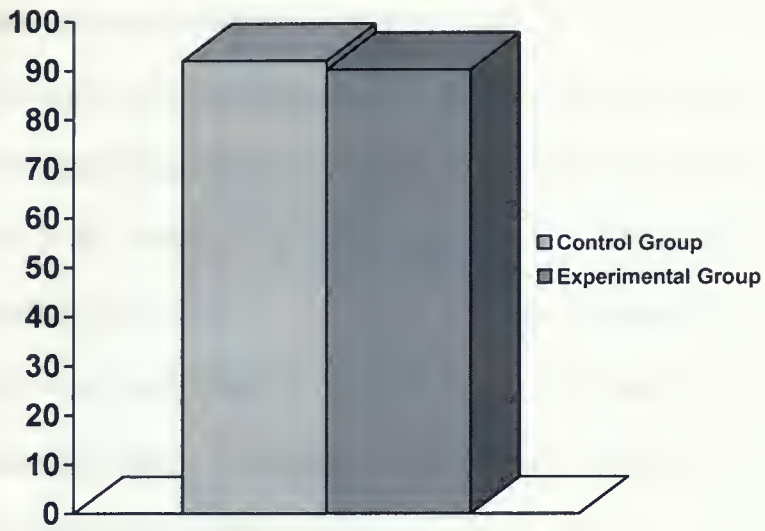


Figure 3. Control and experimental group marginal means for the CELF Core Language Index at T2

However, Print & Word Awareness was the only variable which varied significantly by group status after adjustment for covariates, $F(5, 32) = 5.70, p = .02$ (see Table 7). The estimated marginal means, as displayed in Table 7, show that children in the experimental group scored higher at Time 2 ($M = 6.89$) than children in the control group ($M = 5.48$) on the Print & Word Awareness task. This difference reflects a moderate effect ($\eta_p^2 = 0.15$; Cohen, 1988). No other significant between-group differences were found, however the difference on the Upper Case Letter Identification task neared significance. On that task, the experimental group ($M = 15.73$) outperformed the control group ($M = 11.06$), $F(5, 32) = 3.94, p = .06$.

The significant between-group difference observed on the Print & Word Awareness task invited further exploration of the potential impact of the experimental intervention. Specifically, the next set of analyses was designed to explore whether or not the effectiveness of the intervention varies according to children's characteristics. Given the possibility of a link between the severity of children's language impairments and their response to emergent literacy interventions (Justice et al., 2003) and/or their later reading outcomes (Catts et al., 2002), in this case, it made sense to explore the interaction between the type of intervention and the severity of children's language impairments. Thus, two additional groups were formed: a group of children with severe language impairments (a CELF Core Language Score corresponding to the 16th percentile or below), and a group with non-severe language impairments (those with a CELF Core Language Score corresponding to the 17th-34th percentiles). Within these two groups, differences between the experimental and control groups were investigated. Raw means

and standard deviations on all measures at T1 and T2 are reported in Table 8. Differences between groups are depicted in Figures 4 and 5.

Table 8

Raw Means and Standard Deviations by Group Status and Language Impairment Status for all tasks at Time 2

Language Impairment Status		0-16 th Percentile (Severely Impaired)				17-34 th Percentile (Non-Severely Impaired)				
Group Status		Control Group (n = 11)		Experimental Group (n = 12)		Control Group (n = 8)		Experimental Group (n = 7)		
		Pre-test	Posttest	Pre-test	Posttest	Pre-test	Posttest	Pre-test	Posttest	
Language Impairment Status	PALS Upper Case Letter Identification	M(SD)	2.55(3.14)	9.18(6.48)	1.17(1.47)	12.67(9.98)	8.13(8.48)	15.75(9.62)	7.57(8.59)	18.57(8.72)
	PALS Print & Word Awareness	M(SD)	1.73(1.90)	3.82(1.99)	1.75(1.42)	6.83(1.59)	3.88(2.47)	8.12(0.99)	4.00(2.00)	6.57(2.07)
	PALS Beginning Sounds Awareness	M(SD)	1.00(1.10)	2.55(2.25)	1.00(0.95)	4.08(3.96)	3.25(2.76)	7.75(3.65)	2.29(3.40)	7.29(4.64)
	PALS Rhyme Awareness	M(SD)	1.00(1.34)	3.27(2.69)	1.5(1.31)	3.83(2.44)	4.00(2.39)	6.25(2.49)	2.57(1.72)	5.43(1.81)
	CELF Core Language Score	M(SD)	73.00(8.75)	85.64(10.19)	76(8.71)	83.83(9.41)	90(3.85)	100.25(5.06)	92(1.63)	101.71(6.47)

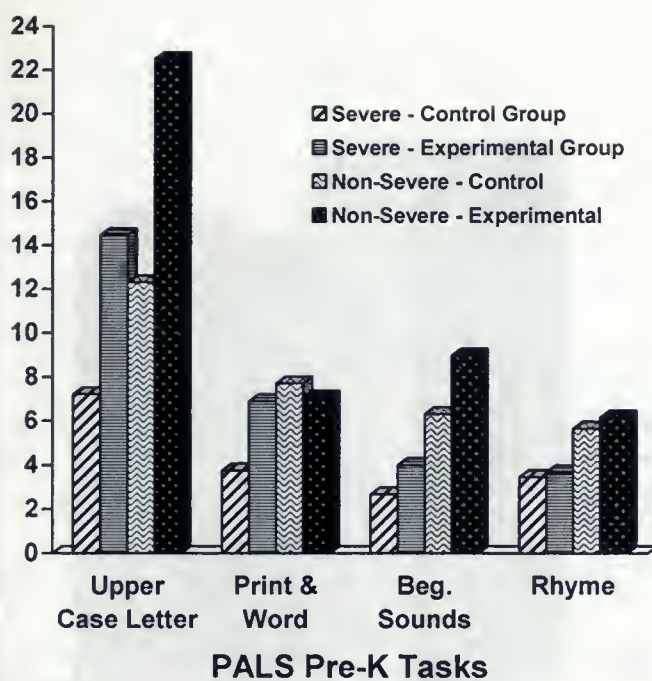


Figure 4. Control and experimental group marginal means for severely and non-severely impaired children for all PALS-Pre-K tasks at T2.

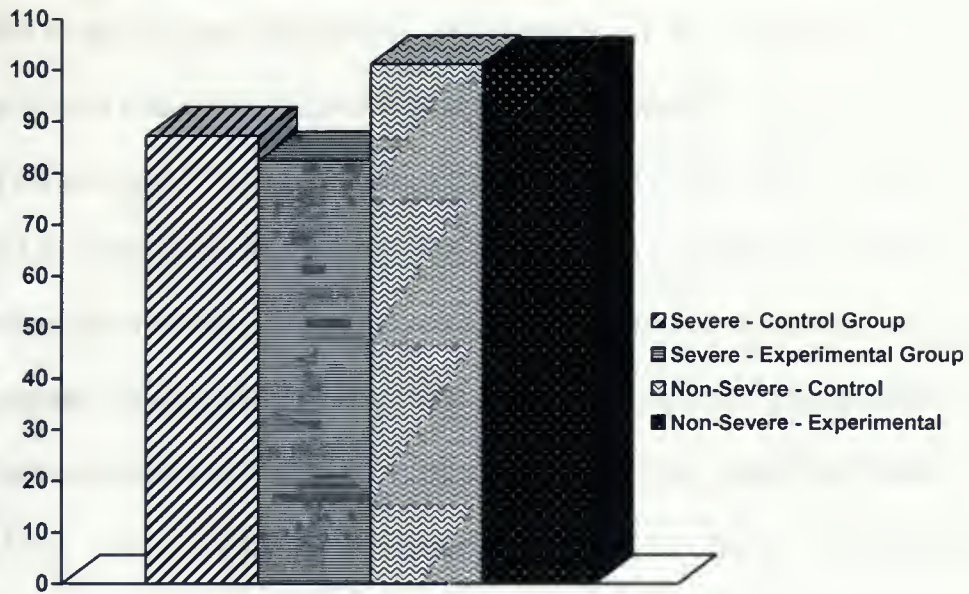


Figure 5. Control and experimental group marginal means for severely and non-severely impaired children for the CELF Core Language Index at T2.

Children with Severe Language Impairments

To begin, the differences between the experimental and control groups of children with severe language impairments were investigated. A between-subjects ANCOVA was performed within the group of severely language impaired children on T2 scores on each of the four PALS-Pre-K early literacy measures and on the Core Language Score of the CELF. Group status (control and experimental) was entered as the independent variable. Covariates were sex, age, cognitive ability, and T1 scores. Within this group of severely language impaired children, significant between-group differences emerged between the experimental and control groups on both the Upper Case Letter Identification, $F(5, 17) = 5.34, p = .03$, and Print & Word Awareness, $F(5, 17) = 28.23, p < .001$ tasks. On both of these tasks, the experimental group scored higher at T2 ($M = 14.47$ and $M = 6.89$ respectively) than the control group ($M = 7.21$ and $M = 3.75$ respectively); on the Upper Case Letter Identification task, the difference reflected a moderate effect size, $\eta_p^2 = 0.24$ (Cohen, 1988), whereas the effect for the Print & Word Awareness task was large, $\eta_p^2 = 0.62$ (Cohen, 1988). Although an examination of the estimated marginal means in Table 9 reveals that the experimental group performed better on all of the early literacy tasks (but not on the language measure) than the control group, no other between-group differences were statistically significant.

Table 9

Estimated Marginal Means and ANCOVA Results Comparing Control and Experimental Groups and Language Impairment

Status at Time 2

	0-16 th Percentile (Severely Impaired)					17-34 th Percentile (Non-severely Impaired)						
	Control Group		Experimental Group			Control Group		Experimental Group				
	Estimated Marginal Mean (Standard Error)		Estimated Marginal Mean (Standard Error)	F	η_p^2	p	Estimated Marginal Mean (Standard Error)		Estimated Marginal Mean (Standard Error)	F	η_p^2	p
PALS Upper Case Letter Identification	7.21 (2.18)		14.47 (2.08)	5.34	0.24	0.03	12.31 (1.74)		22.50 (1.89)	12.84	0.59	0.01
PALS Print & Word Awareness	3.75 (0.42)		6.89 (0.40)	28.23	0.62	0.00	7.70 (0.57)		7.06 (0.64)	0.44	0.05	0.52
PALS Beginning Sounds Awareness	2.66 (1.05)		3.98 (1.00)	0.81	0.4	0.38	6.29 (1.03)		8.96 (1.12)	2.50	0.22	0.15
PALS Rhyme Awareness	3.45 (0.70)		3.67 (0.67)	0.05	0.00	0.83	5.63 (0.69)		6.14 (0.75)	0.21	0.02	0.66
CELF Core Language Score	87.20 (2.67)		82.40 (2.55)	1.62	0.09	0.22	101.12 (1.65)		100.72 (96.65)	0.02	0.00	0.89

Children with Non-Severe Language Impairments

Within the group of non-severely impaired children, a similar pattern of findings emerged. Again, the between-group difference between the experimental and control groups on the Upper Case Letter Identification task was significant, $F(5, 9) = 12.84, p = .01$; this effect was large, $\eta_p^2 = 0.59$ (Cohen, 1988), as the experimental group scored higher ($M = 22.50$) on the task than the control group ($M = 12.31$), after controlling for the covariates (see Table 9 for the marginal means). Likewise, on the Beginning Sounds Awareness and Rhyme Awareness tasks, the experimental group performed better than the control group (see Table 9 for the marginal means), however these differences were not statistically significant. On the Print and Word Awareness task and Core Language Score, the control group performed slightly better than the experimental group, but these results were not statistically significant.

Clinical Significance

Due to the clinical nature of this project, after recognizing that the experimental intervention may in fact have had an impact on some early literacy and language skills for some of the children it was important to investigate the clinical significance of the gains achieved in both emergent literacy and language skills.

Emergent literacy. To examine the clinical significance of children's gains in emergent literacy skills, the T2 observed means of each of the four groups of children (Severe – Control; Severe – Experimental; Non-Severe – Control; Non-severe – Experimental) on the four early literacy tasks were compared to normal developmental ranges for each task (see Table 10) as identified in the PALS-Pre-K Teacher's Manual (Invernizzi et al., 2004). The mean scores observed at T1 and T2

for each of the four groups on each PALS task can be seen in Figures 6-9, where the lower end of the normal range of scores is indicated with a dashed line.

Table 10

Mean Scores at Time 2 and Spring Developmental Norms on PALS Pre-K tasks

	0-16 th Percentile		17-34 th Percentile		PALS Spring Developmental Norms
	Control Group (<i>n</i> = 11)	Experimental Group (<i>n</i> = 12)	Control Group (<i>n</i> = 8)	Experimental Group (<i>n</i> = 7)	
PALS Upper Case Letter Identification	9.18	12.67	15.75	18.57	12-21
PALS Print & Word Awareness	3.82	6.83	8.12	6.57	7-9
PALS Beginning Sounds Awareness	2.55	4.08	7.75	7.29	5-8
PALS Rhyme Awareness	3.27	3.83	6.25	5.43	5-7

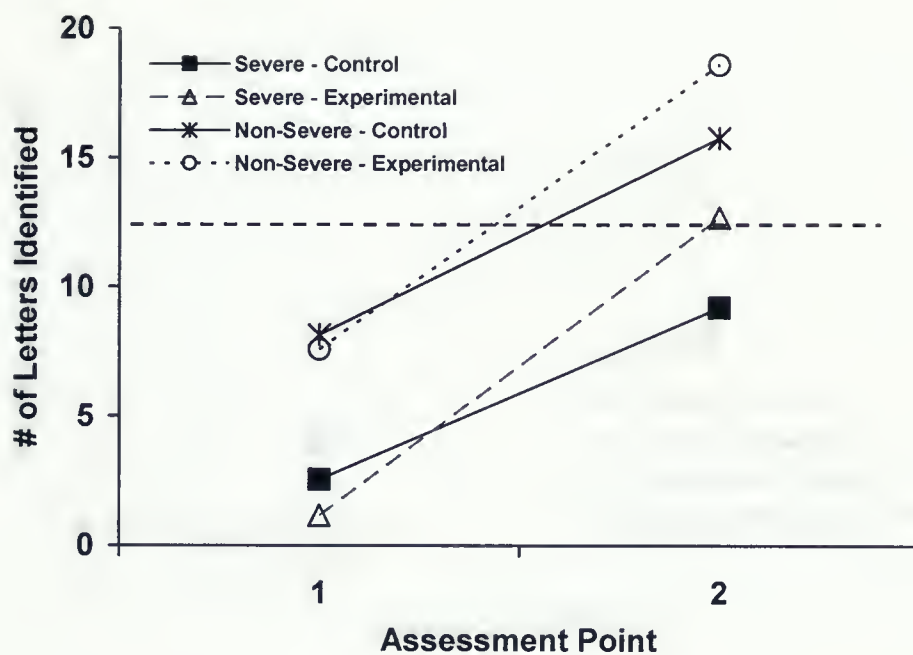


Figure 6. Control and experimental group means for severely and non-severely impaired children on the PALS-Pre-K Upper Case Letter Identification task.

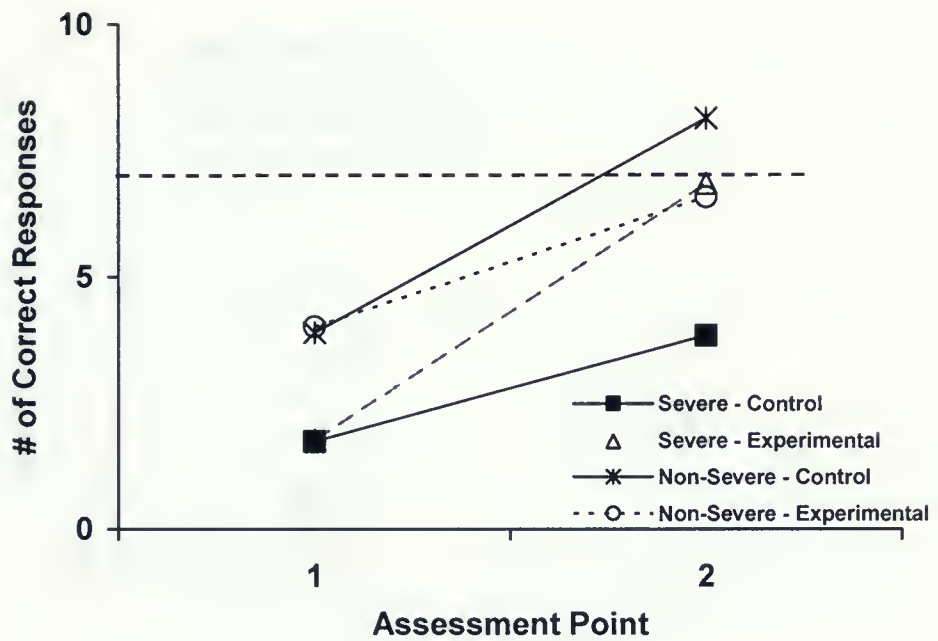


Figure 7. Control and experimental group means for severely and non-severely impaired children on the PALS-Pre-K Print & Word Awareness task.

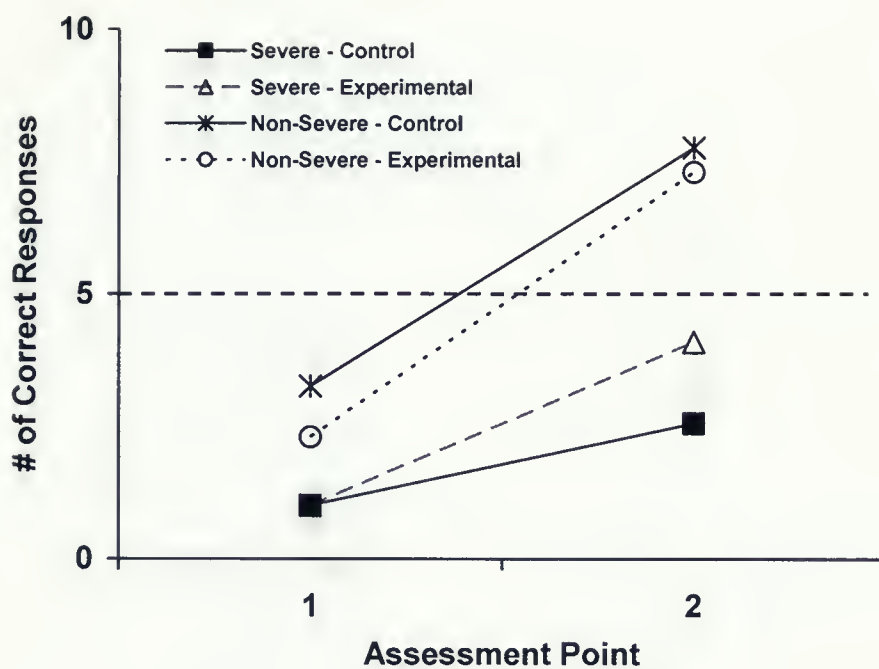


Figure 8. Control and experimental group means for severely and non-severely impaired children on the PALS-Pre-K Beginning Sounds Awareness task.

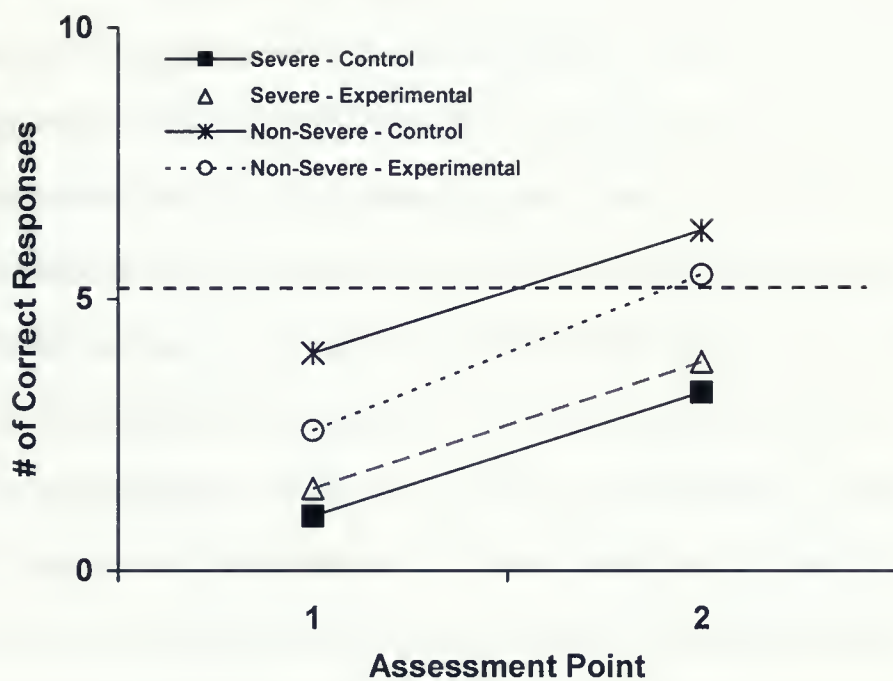


Figure 9. Control and experimental group means for severely and non-severely impaired children on the PALS-Pre-K Rhyme Awareness task.

As seen in Figures 6-9, although the mean score for each group on each task at T1 was below the developmental norm, this was not always the case at T2. At T2, children in the two non-severe groups were within the normal range on every task except the Print and Word Awareness task, where the experimental group was slightly below the norm. In other words, after receiving language intervention, whether it was the traditional therapy or the literacy-enhanced experimental therapy, for the most part children with non-severe language impairments were within the normal range on measures of emergent literacy.

On the other hand, in examining the T2 scores of children in the two severely language impaired groups, no scores were in the developmental norm range except on the Upper Case Letter Identification task, where the experimental group did achieve an average score that falls within the normal range. That is to say, regardless of what form of intervention they received, children with severe language impairments did not, for the most part, achieve scores within the normal range on measures of emergent literacy. However, a visual inspection of the means in Table 10 and Figures 6-9, reveals that although the average scores of both groups of severely language-impaired children do not fall in the normal range (with the exception of the aforementioned result on the Upper Case Letter Identification task for children in the experimental group), on each task the experimental group mean is just slightly below the lower range of the developmental norms. Furthermore, the severely impaired experimental group sometimes appears to achieve scores which are not much different than the scores achieved by the two groups of non-severely impaired children. These results are encouraging in that the scores of the severely impaired experimental group are certainly nearing the normal range and getting

close to the scores observed by their less severely-impaired peers; the experimental intervention is producing clinically significant gains for severely-impaired children.

In general, children who received the experimental literacy-enhanced intervention tended to achieve higher scores on most measures of written language and phonological awareness than children who receive the traditional therapy. The experimental intervention may be particularly helpful for children with severe language impairments. Although these results are not always statistically significant, they appear to be clinically significant gains as severely-impaired children in the experimental group approach the range of scores expected for children their age and the scores achieved by children with less-severe impairments.

Language. In order to determine the clinical significance of the gains observed in children's language abilities, the mean standard scores on the CELF Core Language Score achieved at T2 by each of the four groups of children was examined. As seen in Figure 10, at T2 all four groups of children had a mean standard score above 85 on the Core Language Score. This means that on average, children were functioning with language levels above the 16th percentile, regardless of their initial level of language impairment or their assignment to the experimental or control conditions; no group would fall within the category of "severely impaired" at T2.

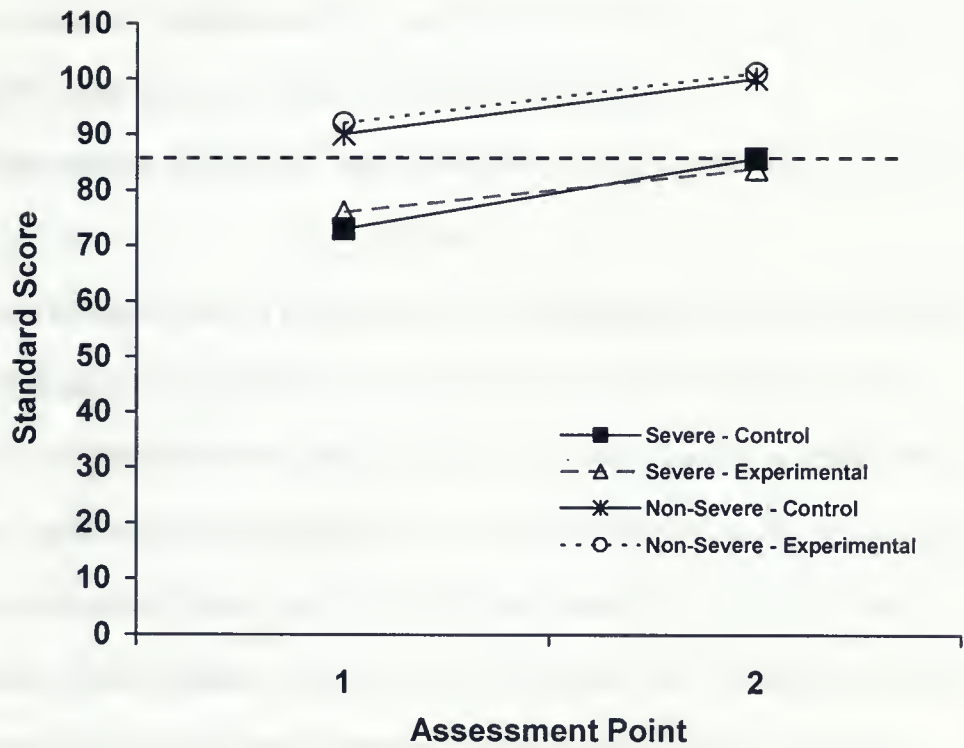


Figure 10. Control and experimental group means for severely and non-severely impaired children on the CELF Core Language Index.

CHAPTER 5

Discussion and Conclusions

This final chapter is organized into four broad sections. The first two sections discuss each of the study's research questions. The third section outlines the general theoretical and practical implications of the study, while the final section notes general limitations of the study and areas where future research is needed.

Part 1 – Exploring the Relationship Among Children's Early Literacy and Language Abilities

The first research question in this thesis explored the relationship between three sets of skills that are often considered to be important predictors of children's later reading ability: early skills in written language awareness, phonological awareness and oral language. As discussed in Chapter 2, there is a certain degree of ambiguity around the definition of emergent literacy and which skills are thought to comprise children's emergent literacy abilities (Sénéchal et al., 2001). While some researchers use the term to refer to children's skills only in written language awareness (Sénéchal et al., 2001), others (Justice et al., 2003; Justice & Ezell, 2004; 2001; Justice & Pullen, 2003) use the term more broadly to include both skills in written language awareness and phonological awareness. Very little empirical work has been done to clarify which skills should be included in our conceptualization of emergent literacy. Therefore, I was interested in empirically exploring the relationship among children's skills in written language awareness, phonological awareness, and oral language in order to determine whether it is useful to distinguish between the three categories of skills, or whether the distinctions should be collapsed and the skills reclassified simply as 'emergent literacy'.

Correlational Analyses

To empirically investigate the relationships between children's skills in the three areas, correlational relationships were examined for children's scores on the two measures of written language awareness (PALS-Pre-K Upper Case Letter Identification and PALS-Pre-K Print & Word Awareness), the two measures of phonological awareness (PALS-Pre-K Beginning Sounds Awareness and PALS-Pre-K Rhyme Awareness), and the one measure of oral language ability (CELF Core Language Score). Not surprisingly, moderate-to-large positive correlations were observed between all variables. Two of the most significant relationships emerged between the two written language awareness tasks ($r = .67, p < .001$) and the two phonological awareness tasks ($r = .40, p < .001$). These results may speak to the appropriateness of classifying letter knowledge and print and word awareness together as measures of "written language awareness" (as do Justice & Ezell, 2004; Justice & Pullen, 2003; and Sénéchal et al., 2001, etc.) and classifying phoneme identification (awareness of beginning sounds) and sensitivity to rhyme together as measures of "phonological awareness" (as suggested by Justice & Pullen, 2003, for example). In addition to the strong positive correlations within the two categories of skills, there were also significant relationships across the two sets of skills. That is, measures of written language awareness were significantly positively related to measures of phonological awareness: the correlation between Print & Word Awareness and Beginning Sounds Awareness was almost as high as the correlation between Print & Word Awareness and Upper Case Letter Identification ($r = .56, p < .001$). These patterns of correlations suggest that all four PALS-Pre-K tasks are highly interrelated, regardless of whether the task is considered a written language or phonological awareness task. In

general, the significant correlations between all four PALS-Pre-K tasks may point to the validity of the PALS-Pre-K measure as an assessment tool which effectively assesses children's skills in one construct which could be referred to as emergent literacy - the construct it was designed to measure (Invernizzi et al., 2004).

Additionally, all four PALS-Pre-K measures were significantly correlated with the measure of oral language: the CELF Core Language Score. One of the highest correlations among all variables was observed between Print and Word Awareness and the CELF Core Language Score ($r = .50, p < .001$). Again, this pattern of findings was not surprising. Researchers have consistently demonstrated a link between oral language and other components of emergent literacy development (Tunmer et al., 1988; Adams, 1990), and Lonigan and colleagues (2000) provided evidence that skills in oral language and components of written language awareness and phonological awareness are interrelated in preschoolers.

Factor Analyses

In order to better understand the relationships between these variables, a hierarchical factor analysis was conducted. In the first step of this analysis, a three-factor model was tested; the three first-order factors that emerged from this model were then entered into a second factor analysis to determine the number and nature of the second-order factors needed to explain the three first-order factors.

Step 1. Previous research has typically distinguished between skills in written language awareness, phonological awareness and oral language (Lonigan et al., 2000; Sénéchal et al., 2001), and as discussed, the correlational analyses in this study did provide some support for making distinctions among the skills in this manner. Therefore,

based on previous literature and the theoretical foundation of this thesis, in the first step of the hierarchical factor analysis, a three-factor model was extracted in order to determine whether the children's skills in the three domains would in fact be distinguishable. The results of the FA indicated that the three factors that emerged were consistent with my theoretical framework. One factor (referred to as "written language awareness") loaded highly with scores on the letter identification and print awareness tasks; a second factor (interpreted as "phonological awareness") loaded highly with children's skills in identifying beginning phonemes and rhyming; and a third factor (called "oral language") loaded highly with children's CELF Core Language Score.

In general, the findings of this first FA confirm that within the battery of measures used in this study, lie three different constructs or sets of skills. This finding is in line with previous research which, as mentioned, has typically distinguished between skills in these three areas. Yet researchers have done little to discuss *why* children's early skills tend to be distinguishable according to these three sub-constructs. One possible reason may be that children's skills in the three areas develop as a function of different influences. For example, skills related to written language awareness are thought to be primarily contributable to experience (McNamara, Scissons & Simonot, 2004; Samuelsson et al., 2005). In other words, children may develop skills in written language awareness through exposure to print and through participation in activities at home, preschool, etc. which introduce them to concepts of print and alphabet knowledge. In contrast, phonological awareness has been hypothesized to be less strongly influenced by environmental influences and more strongly related to genetics (McNamara et al., 2004; Samuelsson et al., 2005), such that children's basic phonological awareness skills may

develop regardless of their level of experience or amount of exposure to phonological information. Oral language is influenced strongly by both environmental and genetic factors (Samuelsson et al., 2005). Therefore, the emergence of the three constructs when analyzing a variety of children's skills may simply be a reflection of the fact that children's abilities in the three areas are developing in a qualitatively different manner.

Another possible explanation for why children's early skills in written language awareness, phonological awareness and oral language emerge as distinct abilities comes from considering not only *how* children develop these skills, but also *when* these skills develop. Children tend to demonstrate skills in written language awareness earlier than skills in phonological awareness (Lomax & McGee, 1987), and oral language abilities are thought to begin developing as early as birth (Snow et al., 1998). Thus, it is not surprising that measuring children's skills across these three areas at one particular point in their development resulted in the emergence of three different groups of abilities; children are likely at very different stages of development within each of the three skill sets.

Clearly, distinguishing among these three constructs of skills may be useful in providing us with a deeper understanding of how and when children's early skills develop; this understanding could lead to practical implications for designing developmentally-appropriate interventions. The usefulness of making distinctions between the three sets of skills for intervention-related purposes will become more apparent later in this chapter, while discussing the results of the second research question.

At the same time, researchers have demonstrated that while it may be useful to distinguish between children's skills in these three areas, it is also important to recognize that the three areas are interrelated. For instance, in a study by Samuelsson et al. (2005),

although children's numerous skills in written language awareness (referred to as 'print knowledge' by the authors), phonological awareness, and oral language (referred to as 'general verbal ability' by the authors) distinguished themselves in a factor analysis, these three broad constructs were highly correlated. Furthermore, it has been suggested that skills in one construct may be dependent on skills in another (e.g., Lomax & McGee, 1987; Sénéchal et al., 2001). In the current study, the three factors that emerged from the three-factor model were in fact correlated, thus confirming the findings of previous research. To better understand the meaning of the interrelationships between these factors, an additional FA was conducted.

Step 2. The second FA was conducted to determine the nature and number of second-order factors which were needed to explain the three first-order factors that were extracted in the three-factor model in Step 1. In this FA, only one second-order factor emerged, and was well-explained by the variables; this factor was interpreted to represent the construct of emergent literacy.

Taken together, these findings may suggest that emergent literacy abilities may be better understood theoretically as one broad, unitary construct that encompasses three sub-constructs: written language awareness, phonological awareness and oral language. While it is certainly useful to make distinctions between these sub-constructs in order to gain a deeper understanding of how and when children's emergent literacy skills develop, it appears that when conceptualizing emergent literacy at a theoretical level, it is important to understand that these separate sub-constructs are interrelated and together, can be thought to comprise one broad construct called 'emergent literacy'. Excluding any one sub-construct from a conceptualization of emergent literacy (as Sénéchal et al., 2001,

among others, do), may over-simplify the complex interrelationships of skills that are at work, influencing children's overall emergent literacy abilities, and ultimately, their later reading achievement.

Limitations

Caution must be taken in interpreting these results. The sample size ($n = 55$) used in these analyses is typically considered low for FA (Tabachnick & Fidell, 1996). Also, the number of measures used to define each factor was less than satisfactory, and therefore the factors that emerged in these analyses may be considered to be poorly defined (Tabachnick & Fidell, 1996). The variables used were also very broad measures of certain skills: for instance, phonological awareness is often considered to be a complex set of skills across tasks such as rhyming, segmenting, blending, etc. at the level of words, syllables, phonemes, etc. (Snow et al., 1998); however in this study phonological awareness was assessed only at the level of identifying beginning phonemes and rhyming. More thorough measurements of the numerous specific skills known to comprise written language awareness, phonological awareness and oral language may have altered the relationships between variables.

Furthermore, the correlational analyses and factor analyses were conducted using children's scores at only one point in time, when children were in the emergent phase of literacy development. Although the results of these analyses indicated that all variables were interrelated and best described as three sub-constructs of one unitary construct interpreted to be emergent literacy, it is possible that the interrelationships between the variables and the relationship between the variables and the construct of emergent literacy may change over time; the nature of these relationships may not be fully

understood until they can be explored in the context of their longitudinal relationship with early reading. For example, in the investigation by Sénéchal and colleagues (2001), the need to adopt a more focused view of emergent literacy which consisted of only children's skills in written language awareness (and not their skills in phonological awareness or oral language) became clear only through observing how the relationships between children's skills in these areas changed from kindergarten through to grade one, and by observing how children's skills in some areas but not others had an impact on actual reading abilities in grades one and three. Since it was not possible to offer this sort of longitudinal examination of the relationships between components of emergent literacy and later reading ability, it is important to recognize that the emergence of emergent literacy as a broad unitary construct in this study may reflect a pattern of skill development that existed only at the time of measurement, and which may be subject to change over time.

In addition, one final note must be made concerning the interpretability of the results. Tabachnick and Fidell (1996) point out the need to recognize that the results of FA can be very different when they are conducted with different samples. Thus, the underlying component structure which emerged in this study is highly specific to the sample with which it was observed. For example, with another group of children who are a different age; who have typically developing language skills; who have impaired speech processes rather than language processes; who have other risk factors such as low socioeconomic status, or who are different from our sample in any other way, the pattern of interrelationships between variables may have been completely different. In other words, we must acknowledge the specificity of our results, which are merely

representative of the early skills of our specific sample of language-impaired preschool children.

Part 2 – Exploring the Effects of the Experimental Intervention

The second set of research questions was based on exploring the effectiveness of the experimental literacy-enhanced language intervention in improving preschooler's early skills in written language and phonological awareness, and oral language. Based on the previous results, it seems appropriate to consider the impact of the intervention on children's skills in each of the three skill areas separately. Because written language awareness and phonological awareness skills were both assessed with the PALS-Pre-K measure, these will both be discussed together; oral language ability was measured with the CELF Core Language Score, and the effects of the intervention on children's scores on the CELF are discussed later.

Effects on Written Language and Phonological Awareness Skills

In looking at the entire sample of children after 12 weeks of therapy, results indicated that the experimental group achieved higher scores on all PALS-Pre-K tasks than children in the control group. However, the only statistically significant difference was on the Print & Word Awareness task, although differences on the Upper Case Letter Identification task approached significance. To investigate the effects of the intervention even further, I decided to explore whether or not the severity of children's language impairment played a role in determining how children would respond to the experimental and traditional interventions. Results revealed that for children with severe language impairments, the group receiving the experimental intervention always outperformed children in the control group on the PALS-Pre-K tasks; the between-group differences

were statistically significant for both the Upper Case Letter Identification and Print & Word Awareness tasks. Similarly, for children with non-severe language impairments, the group receiving the experimental intervention outperformed children in the control group who were receiving the traditional therapy on three of the four PALS-Pre-K tasks, and the between-group difference on the Upper Case Letter Identification task was statistically significant. On the Print and Word Awareness task, the control group performed slightly better than the experimental group, but statistically, these results were almost negligible.

From an applied research perspective, it was informative to consider the clinical significance of the gains achieved by children on the PALS-Pre-K measure. To do so, the scores children achieved on the PALS-Pre-K tasks after participating in language therapy were compared to the “spring developmental ranges” identified in the PALS-Pre-K Teacher’s Manual (Invernizzi et al., 2001). Although the PALS-Pre-K measure is not a norm-referenced tool, it does provide the spring developmental ranges, which can be taken as a “general sense of where four-year-old children might be if they are on the typical path of literacy development associated with successful later reading” (Invernizzi et al., 2004, p. 62). Children’s spring PALS-Pre-K scores are moderately to highly correlated with their fall PALS-K scores, and these spring developmental ranges are generally predictive of reading success in first grade (Invernizzi et al., 2004). For children in the non-severely impaired group, it appears that language therapy of any type (the literacy-enhanced therapy or the traditional therapy) produced clinically significant gains: regardless of what intervention they received, most children were functioning within the spring developmental ranges on measures of written language and phonological

awareness. In contrast, the severely impaired children who participated in the experimental intervention were closer to the spring developmental ranges than the severely impaired children who received the traditional language intervention.

Generally, the pattern of results observed in this study indicates that the experimental intervention may be particularly effective in improving children's written language awareness, (letter identification and awareness of print) but not their phonological awareness (awareness of beginning sounds and rhyming). The fact that the intervention influenced children's skills in these two constructs differently provides evidence of the importance of distinguishing between children's skills in written language awareness and phonological awareness, as discussed earlier. Furthermore, the intervention effect observed with respect to children's skills in written language awareness is very encouraging, given the relationship between children's early skills in this area and their later reading abilities (Hamill, 2004). Young children's awareness of print has been shown to be strongly related to later reading-related skills (Lomax & McGee, 1987), and the ability to identify letters has consistently been demonstrated to be the single most reliable predictor of later reading ability (Blatchford et al., 1987; Catts et al., 2002; Snow et al., 1998).

However, early skills in phonological awareness have also been linked to later reading ability (National Reading Panel, 2000), and thus it is important to understand why the experimental intervention was not as effective at influencing children's skills in this area. One possible explanation for these results may come from once again considering the order in which children acquire skills in written language and phonological awareness: if children typically develop written language awareness earlier

than phonological awareness, it may be the case that the children in the present study simply have not begun to develop their phonological awareness abilities to the same extent as their skills in written language awareness, and therefore, the interventions did little to affect their phonological awareness skills. As mentioned previously, support for this explanation is seen in research indicating that awareness of print concepts is thought to be one of the earliest skills children develop (Lomax & McGee, 1987), and an examination of the mean scores achieved by children on both of the written language awareness tasks in this study reveal that on average, children do better on these tasks than they do on the two phonological awareness tasks (see Table 3). Furthermore, the development of skills in phonological awareness may depend on earlier skills in print awareness (Lomax & McGee, 1987) and alphabet knowledge (Juel & Meier, 1999), and some phonological awareness tasks such as rhyming are thought to be particularly difficult for preschoolers with language impairments (Boudreau & Hedberg, 1999). Therefore, it may be suggested that the experimental intervention was particularly effective for tasks of written language awareness because developmentally, these skills are the ones that children are actually in the process of acquiring at this stage of literacy development. The intervention was less effective at influencing children's phonological awareness skills because these skills are only just beginning to emerge, and may be at least partially dependent on the development of skills in written language awareness.

Another possible explanation for the finding that the intervention was more successful in influencing children's achievement on tasks of written language awareness than tasks of phonological awareness is that certain skills may be more sensitive to intervention than others. As mentioned earlier, research has demonstrated that while

skills in alphabet knowledge and print awareness may be more susceptible to environmental than genetic influences, children's phonological awareness skills have a strong genetic influence (McNamara et al., 2004; Samuelsson et al., 2005). Although it is certainly not the case that children's phonological awareness is unresponsive to early exposure to the phonological components of language (e.g., see Bryant, MacLean, Bradley & Crossland, 1990), it is sensible to assume that early instruction will be more effective in increasing children's written language awareness skills – which are sensitive to early experiences – than their phonological awareness skills, which may be more strongly influenced by genetics than experience (McNamara et al., 2004). Quite simply, it may be easier to improve children's written language awareness abilities through intervention than their phonological awareness.

Related to this idea, it is also important to consider that the nature of the intervention itself may explain why the intervention was successful in impacting children's performance on some, but not other PALS-Pre-K tasks. As discussed in Chapter 2, certain skills are fostered more effectively through embedded, naturalistic approaches to literacy instruction, while others are better learned through explicit teaching. Children's alphabet knowledge and print awareness – which are highly sensitive to environmental influences – are skills which can be effectively taught through embedded approaches (Justice & Ezell, 2002), whereas researchers often point to the need to use a direct, explicit approach to teach phonological awareness – which, as discussed, may be less susceptible to environmental influences (e.g., Justice et al., 2003; O'Connor et al., 1993). Although the experimental intervention employed in this study was designed to balance an embedded-explicit approach, it may be the case that the

explicit, direct teaching components were not explicit or intensive *enough* to impact the weak phonological awareness skills of the children with language impairments in our study. For instance, explicit instruction may need to be provided more frequently. As discussed previously, other interventions have demonstrated success in teaching phonological awareness skills to young children with language impairments (O'Connor et al. 1993; Laing & Espeland 2005; van Kleeck et al., 1998; Warrick et al., 1993). These interventions have all used explicit, direct approaches to teaching phonological awareness skills in preschoolers with language impairments, with two to four 10-20 minute sessions per week. The findings of these studies point to the need to provide funding for more frequent therapy sessions for preschoolers with language impairments if we hope to impact their phonological awareness skills through a literacy-enhanced language intervention.

Effects on Oral Language Skills

Children's oral language abilities, as measured broadly with the CELF Core Language Score, were assessed after completing the 12-week intervention. When comparing the experimental and control group of the entire sample at T2, the control group performed slightly better on the measure of oral language, but this difference was far from statistically significant. These results were similar within both the severely and non-severely impaired groups, although within the severely-impaired group, it should be noted that the average standard score achieved by the control group was nearly 5 points higher ($M = 87.20$) than that of the experimental group ($M = 82.40$). From a clinical perspective, it is worthwhile to note that within the entire sample, both the experimental and control groups achieved a mean standard score above 85 at T2, and were therefore

not classified as severely-impaired, regardless of which intervention they participated in. Within the group of severely impaired children, the control group, but not the experimental group, were generally no longer classified as severely-impaired after receiving 12 weeks of treatment, although the experimental group was just below the cutoff for being classified as non-severely impaired. These results are encouraging in that, overall, it appears that children's language skills improve as a result of participating in language therapy, whether the intervention is enhanced with an emergent-literacy component or not.

Severity of Language Impairment and Response to Intervention

As previously mentioned, the severity of children's language impairments did impact their response to intervention. While there was a statistically significant difference between the experimental and control groups' performances on two PALS-Pre-K tasks in the severely impaired children, the intervention appears to have only significantly affected children's skills on one PALS-Pre-K task in the non-severely impaired children. This finding is somewhat contradictory to the suggestion from Justice et al. (2003), that children with more severe language impairments are less influenced by emergent literacy interventions. However, it does lend support to the possibility that children with more severe impairments require different intervention approaches than those with less-severe impairments (Justice et al., 2003), as children responded differently to the current interventions based on the severity of their impairments.

One possible explanation for the finding that children with more severe impairments experienced more widespread gains after participating in the experimental intervention than those with non-severe impairments, can be taken from a suggestion

made by Gillam and Johnston (1985). They suggested that those children with greater communicative abilities may require less experience with print to develop an understanding of print, than those children with poorer communicative abilities. In other words, children with more severe language problems require more extensive exposure to print in order to develop their print awareness skills. In the context of the current study, this statement could be taken to explain that the children with non-severe language impairments were able to develop their print awareness skills even with minimal exposure to print, and therefore, even those children in the control group who were not continually being exposed to print were sufficiently able to develop their print awareness. In contrast, according to Gillam and Johnston's (1985) theory, children with severe impairments require more extensive exposure to print to develop their skills; those children in the experimental group who were continually being exposed to print were able to develop their print awareness, but those in the control group were not. Again, future research needs to clarify the relationship between the severity of children's language impairments and their response to emergent literacy interventions and determine what forms of intervention work best for children with different levels of impairment.

Limitations

In general, caution must be taken in interpreting these results. Statistically, the possibility of making a Type I error was inflated as a result of analyzing the data with several univariate ANCOVAs to assess the effect of the experimental intervention on each of the PALS-Pre-K tasks and the oral language measure (Tabachnick & Fidell, 1996). Thus, there is an increased possibility that the significant between-group

differences observed on some of the PALS-Pre-K tasks were actually due to chance. Although this possibility would typically be eliminated through the use of MANOVA rather than multiple ANCOVAs, in this case a MANOVA was not feasible because of the desire to statistically control for children's T1 scores on each of the dependent variables.

In addition, it should be noted that the measures used as dependent variables in this study did not address all of the components that were included in the experimental intervention. For instance, narrative abilities, which were targeted by the intervention, were not measured in any of the PALS-Pre-K tasks or the CELF Core Language Score; segmenting and blending skills were components of phonological awareness that were taught as part of the experimental intervention, but were not assessed with the phonological awareness tasks on the PALS-Pre-K measures. Therefore, the results may not fully capture the effects of the experimental intervention on children's emergent literacy abilities.

Furthermore, one important confounding variable which could not be controlled for in this study, was the fact that all but one of the preschoolers who were participating in the project were attending a preschool program during the course of the study. Although it is expected that many of these programs addressed some of the language and literacy goals that were of interest in this study, it is likely that there was some degree of variability in the content of the instruction that children received while at their preschool program; their experiences outside of the language therapy may have impacted their achievement on the PALS-Pre-K and CELF tasks. It is hoped that the differences in children's achievement which may have been accounted for by the variability in their

preschool programs would be similar across the control and experimental groups, however this cannot be guaranteed.

Implications

Theoretical Implications

As discussed, within the field of early literacy, there has been some inconsistency in the way researchers have conceptualized the construct of ‘emergent literacy’ and which skills are thought to comprise children’s emergent literacy abilities; there has been minimal empirical work to resolve this issue. In the present study, empirical results revealed three main patterns of findings: a) three categories of skills do emerge, as expected, distinguishing between children’s abilities in written language awareness, phonological awareness, and oral language; b) although these skill constructs are distinguishable, they are also interrelated; c) the three skill constructs may be better understood as sub-constructs of one broad construct known as emergent literacy. The results of the current study point to the need to conceptualize emergent literacy as a broad construct comprised of three separate but interrelated sub-constructs: written language awareness, phonological awareness and oral language. However, in conceptualizing emergent literacy in this way, it is also important to recognize the value of distinguishing among these sub-constructs in order to provide us with a richer understanding of the way in which children’s various emergent literacy skills develop and respond to intervention differently. This theoretical interpretation will encourage researchers and practitioners to fully appreciate the complexity of children’s emergent literacy abilities, which will in turn have practical implications in terms of providing a theoretical basis for designing emergent literacy interventions.

Practical Implications

The current findings also hold important practical implications around supporting children with language impairments. The results of this study supported the common finding that some children with language impairments have poor emergent literacy skills, and indicated that to some degree, a language intervention which is enhanced with emergent literacy components is more useful than traditional language therapy in improving children's emergent literacy skills. At the most basic level, this finding points to the need to devote resources to providing children with language impairments with an early intervention which addresses their emergent literacy needs. Doing so may put these children back on the path to normal reading development, so that by the time they enter school and begin receiving formal literacy instruction, they have the foundational skills they need to succeed. Importantly, in this study, the gains achieved in written language and phonological awareness by children receiving the literacy-enhanced language intervention generally did not appear to come at the cost of improvements in language ability. That is, regardless of the type of intervention they received, all children in the study improved in their language abilities. Therefore, support was provided for the suggestion that language and literacy goals can be met simultaneously by adding literacy to children's existing language therapy regimes (Gillon & Dodd, 2005; Schuele et al., 2007; Tallal et al., 1997). Moreover, the literacy component of the experimental intervention in this study was only directly targeted in the first 15 minutes of each therapy session (and then embedded throughout the rest of the language therapy); thus, it appears that with minimal time and effort, language interventions can be modified

slightly to incorporate literacy activities that will produce significant gains in emergent literacy abilities.

Another important finding from this study was that the experimental intervention impacted children's emergent literacy abilities differently depending on the severity of their language impairment. Children with severe impairments appeared to benefit more from the literacy-enhanced intervention in comparison to the traditional intervention, to a greater extent than the children with non-severe impairments. This finding offers promise that there are intervention approaches that can be effective with the most severely-impaired preschoolers, and the intervention model employed in the current study may be looked at for examples of the types of strategies that may be particularly effective for this group of children who are typically thought to demonstrate less response to intervention than those children with less severe impairments (eg. Justice et al., 2003).

Furthermore, important implications can even be seen by examining the methods used in this study to classify children with severe and non-severe language impairments. As discussed in the methodology section, children in our 'non-severe' language impairment group were children who, based on their CELF Core Language Score scores, would be considered to have 'average' language abilities. However, based on informal testing and the clinical judgement of these children's assigned speech-language pathologists, the children were still considered to have impairments in language and thus were included in the study. Although the non-severely impaired group didn't appear to be influenced by the intervention as much as the severely impaired group, significant gains were seen in the emergent literacy and language abilities of some of these children as a result of participating in the experimental intervention. These findings not only indicate

that we must recognize that individual differences in response-to-intervention do occur, but further, that we must acknowledge the value of clinical judgment in identifying children who demonstrate a need for early language and literacy intervention. Some benefits can be observed when we do not rely strictly on standardized tests and stringent cut-offs as a means of determining children's eligibility for treatment.

General Limitations and Areas for Future Research

There are some limitations of the current study that must be acknowledged. First of all, the generalizability of the results is limited, given the small, fairly homogeneous sample of participants in this study. Future research should replicate this study with a larger, more diverse sample, and the effectiveness of a similar intervention could be explored with other groups of preschoolers who are considered at-risk for future reading problems for reasons other than having a language impairment (ie. Children from disadvantaged backgrounds, children with developmental delays, etc.). Furthermore, it is clear that including an additional control group of typically developing children would have provided us with a deeper understanding of the effectiveness of both the traditional and experimental interventions in improving children's emergent literacy abilities. It would have been useful to compare the emergent literacy development of language-impaired children with those of typically developing children, both prior to and after participating in their respective interventions.

A second limitation emerges from the applied nature of this project. Because this study was conducted in an applied setting rather than a controlled laboratory, there were several issues that were beyond the control of the research team. For instance, there were ten clinicians who provided therapy to the children in this study; although there were

clear guidelines for the content and style of the therapy sessions and several steps were taken to ensure treatment fidelity (refer to Chapter 3), there may still be a certain degree of variability associated with each clinicians' delivery of the experimental and traditional interventions. Necessarily, there was also a lot of variability with respect to the language therapy received by children in this study; the content of language therapy and the activities used to develop children's language skills during therapy sessions and through homework was personalized for each child to target their unique language goals. Again, although clear guidelines for the interventions and homework were provided, standardizing the traditional intervention or the language components of the experimental intervention was impossible. Despite the measures taken to minimize their impact, these sources of variability in the treatment received by children participating in this study certainly pose a threat to the reliability of the results. However, in recognizing the value of applied research, we assume these risks and argue that our applied project is very reflective of the reality of language interventions. In any applied setting, it will be necessary to adapt and adjust to individual children and circumstances; an intervention that is demonstrated to be effective in this setting holds promise that clinicians are able to successfully utilize their expertise to deliver a form of treatment that can improve children's emergent literacy skills while simultaneously being responsive to children's individual needs

Another limitation relates to the long-term effects of the intervention. Although this thesis is part of a larger study which examines the effectiveness of the intervention longitudinally, in the present study, the effects of the intervention was investigated based on children's achievement on several emergent literacy tasks after the intervention. It

would be interesting to examine, as the longitudinal project does, whether the gains observed in the present study are maintained over time, and specifically, whether quantitative and qualitative differences in children's abilities emerge once the children begin actually reading. Furthermore, the effectiveness of the intervention could also be measured with respect to outcomes other than children's literacy achievement, such as their enjoyment or interest in reading after participating in the intervention.

Several other research questions emerge that are beyond the scope of the proposed study. For instance, in the proposed study, the only child-related factors that were considered with respect to children's response to intervention were the child's age, sex and cognitive ability (which served as covariates), and the severity of the child's language impairment (used to classify children to determine the differential impact of the intervention). Future research may examine the role of other child-related variables, such as speech skills, socioeconomic status, ethnicity, and primary language spoken in the home, for example, in impacting children's response-to-intervention. Exploring the nature of the intervention itself, and how this is linked to children's response-to-intervention is also important. For instance, do children with certain characteristics respond better to some aspects of the intervention but not others? Do some children require more explicit intervention approaches, whereas other children respond better to embedded approaches? Is the frequency or duration of the therapy sessions and the intervention important for some children? These are all questions that should be undertaken in future intervention studies in order to further our understanding of how to develop emergent literacy skills in children who are at-risk for later reading difficulties.

In general, the results of this thesis are encouraging and suggest that enhancing children's language interventions with an emergent literacy component may be beneficial in improving their emergent literacy skills. However, more research is needed to clarify the nature of emergent literacy and the relationship between children's early skills in written language and phonological awareness and oral language, as well as to further understand the effectiveness of the intervention by considering a) how children participating in the intervention compare to typically-developing children with respect to literacy development; b) the long-term effects of the intervention; c) which child-related factors contribute to children's response-to-intervention; and d) which intervention-related factors contribute to different children's response-to-intervention.

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APPENDICES

Appendix A

Information Letter/Consent Form

Informed Consent

Date: **May 18, 2006**

Project Title: **Emergent Literacy for Preschool Children with Language Difficulties**

Co-Principal Investigator: **John McNamara**
Department of Child and Youth Studies,
Brock University
 Tel: **905.688.5550 ext 3835**

Co-Principal Investigator: **Jackie Van Lankveld**
Speech Services Niagara
 Tel: **905.688.3550**

INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to develop and measure the effects of an emergent literacy facilitation program designed to support pre-school children who have been identified as having speech and/or language difficulties. The research will be conducted by Dr. John McNamara from Brock University in partnership with Jackie Van Lankveld, the Director of Speech Services Niagara. The research is aimed at measuring the effectiveness of an emergent literacy facilitation program that includes a primary focus on phonological and print awareness on children as they progress from pre-school (age 3 and 4) to grade one (age 6).

WHAT'S INVOLVED

As a participant, you will be asked to possibly include your child in an enhanced language therapy that includes a pre-literacy component in addition to the typical language therapy they would receive from Speech Services Niagara. As a participant your child will be randomly assigned to one of two groups. The first group will include children who receive the enhanced form of language and literacy therapy. The new pre-literacy component of this therapy is designed to support children's reading as they progress into elementary school. The second group will include children who will receive the typical language therapy. Both groups of children are important parts of the study. You may be concerned that your child will be assigned to the typical language therapy group and therefore not receive the enhanced literacy-based therapy. This new therapy has not yet been proven to be enhanced and testing this new therapy is the purpose of the study. We are currently unaware of the effects of this therapy. At the end of the study you may access the summary of the results of this study which will describe the components of the enhanced therapy – components that you can implement at home and at school.

Your child's participation in this study will take no longer than typical language therapy they would be provided if they did not participate in the study. Children participating in the study will not notice any difference in the delivery or service they will experience in their language therapy sessions. In addition to the therapy sessions, we will be contacting parents to conduct follow-up assessments. There will be two follow-up assessments approximately 3 months and 1 year after their last therapy session at SSN. The follow-up assessments will take approximately 1 hour and may take place at the Niagara Peninsula Children's Centre or at your home. The follow-up assessment will be conducted by the same Speech and Language Therapist that completed your child's therapy. An honorarium of \$50 will be paid to participating families at the end of the last follow-up assessment.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include your child gaining enhanced literacy skills that will assist in her/his future reading ability. There are no known or anticipated risks associated with participation in this study. Your decision to participate or not is totally up to you and has no bearing whatsoever on your therapy services. You may be concerned that when participating in the study your child will not receive the enhanced literacy-based therapy. This new therapy has

not yet been proven to be enhanced and this is the purpose of the study. You may access the summary of the results of this study which will describe the components of the enhanced therapy – components that you can implement at home and at school.

CONFIDENTIALITY

All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Data collected during this study will be stored with your child's speech and language therapist as well as with the principal investigator. Data pertaining to the research study will be kept for 10 years after which time it will be destroyed. Access to this research data will be restricted to the research team consisting of Dr. John McNamara, Jackie Van Lankveld (Director of Speech Services), and the Research Assistants working on the research project.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available by contacting the principal investigator at the above address. A summary of preliminary results will be available in September 2007.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (insert file #). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

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

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____ Date: _____

Appendix B

Sample of a Lesson Plan for the Literacy Component of One Experimental

Intervention Session

Week Eight Spot's Birthday Party by Eric Hill	
Activity #3	
Objective: To segment words into syllables and to blend syllables into words	
Phonological Awareness	Materials: book
	<p>Activity Description:</p> <ul style="list-style-type: none"> • Tell the children how some words have a lot of parts, but others have only one part. You could say: <ul style="list-style-type: none"> ○ <i>Today we are going to listen for the parts of words. Some words have two parts, like the word birthday. Clap for each syllable in this word: birth-day. (Be sure to clap as you say the syllable in the word, not before or after.) Some words have only one part, like the word Spot. Clap for the one syllable in this word: Spot.</i> • Now, tell the children that you are going to say some words that are broken into their smaller parts. Tell the children to try to identify the word you are saying. Use these seven words, and say them syllable-by-syllable with a 2-second pause between the syllables. <ul style="list-style-type: none"> ○ Par-ty ○ Cup-board ○ Some-one ○ Be-hind ○ Sill-y ○ Ta-ble ○ Cur-tain <p>After you say each word and the children have an opportunity to guess what it is, model the correct answer. You could say:</p> <ul style="list-style-type: none"> ○ <i>I said part-y The word is party. I broke the word into its two parts, part-y, and then you had to put them together to figure out the word. Party has two parts: part-y. Let's say those two parts: part-y Now let's say the word with all its parts pushed together: party.</i> ○ <i>I said cup-board. The word is cupboard. I broke the word into its two parts, cup-board, and then you had to put them together to figure out the word. Cupboard has two parts: cup-board. Let's say those two parts: cup-board. Now let's say the word with all its parts pushed together: cupboard.</i>
Activity #4	
Objective: To recall three or more major events in a story	
Narrative	Materials: book, chalkboard or large paper to write down ideas
	<p>Activity Description:</p> <ul style="list-style-type: none"> • Re-read the book. • During reading: Comment about major events in the story. You could say: <ul style="list-style-type: none"> ○ <i>It is Spot's Birthday.</i> ○ <i>Spot is playing hide and seek.</i> ○ <i>Spot found the bear behind the curtain.</i> • After reading: Talk with the children about the major events of the story. You could say: <ul style="list-style-type: none"> ○ <i>Spot was playing hide and seek with his friends. Let's try to remember where Spot found his friends.</i> • Write the major events on the chalkboard or paper. After listing several events, read the list to the children. You could say: <ul style="list-style-type: none"> ○ <i>These are all the events we remembered from our story.</i>

Appendix C

Sample Outline of One Complete Experimental and Control Group Therapy Session for
Children With the Same Language Goals

Language Goals:		
1) Understanding and use prepositional phrases/concepts: behind, in front, beside 2) Will use negation (is not, do not) with 80% accuracy in structured task. 3) Will use possessive pronouns his, hers, theirs with 80% accuracy in structured task. 4) Expand expressive vocabulary.		
	Experimental Group (Literacy-Enhanced Therapy)	Control Group (Traditional Therapy)
Introduction	<ul style="list-style-type: none"> • Open the session with a discussion about birthdays. Ask the child how old they are. Do they remember their birthday party? Did they get any toys? What else might they see at a birthday party? • Read Spot's Birthday Party and follow the outlined lesson plan as per the modified <i>Read It Again!</i> regime • Review the prepositions behind, in front and beside as you find the animals in the book. • Talk about what you see at a birthday party 	<ul style="list-style-type: none"> • Open the session with a discussion about birthdays. Ask the child how old they are. Do they remember their birthday party? Did they get any toys? What else might they see at a birthday party?
Activity One	<p><u>Target:</u> possessive pronouns HIS/HERS <u>Target:</u> expressive vocabulary – toy labels and actions</p> <ul style="list-style-type: none"> • Pretend it is a birthday party and the children open presents to give to the boy and girl dolls. • Place 10 pictures of different toys in small presents that can be opened. • Let the child open the present one at a time. • Let the child label each toy inside the present. • Talk about what we do with each toy. Think of an ACTION word. Can we push the toy (car), pull the toy (wagon), throw the toy (ball), jump with the toy (rope), fly the toy (kite). • Following the discussion of what we do with the toy, let the child decide whose toy it is. The SLP can cue the child "Is it <i>her</i> toy or <i>his</i> toy?". As the child gets 	<p><u>Target:</u> possessive pronouns HIS/HERS <u>Target:</u> expressive vocabulary – toy labels and actions</p> <ul style="list-style-type: none"> • Pretend it is a birthday party and the children open presents to give to the boy and girl dolls. • Place 10 pictures of different toys in small presents that can be opened. • Let the child open the present one at a time. • Let the child label each toy inside the present. • Talk about what we do with each toy. Think of an ACTION word. Can we push the toy (car), pull the toy (wagon), throw the toy (ball), jump with the toy (rope), fly the toy (kite). • Following the discussion of what we do with the toy, let the child decide whose toy it is. The SLP can cue the child "Is it <i>her</i> toy or <i>his</i> toy?". As the child gets used to the format, the SLP can sub-step

	<p>used to the format, the SLP can substep and merely asks “Whose toy is it?”</p> <ul style="list-style-type: none"> • After all the presents have been distributed, review what the girl and boy can do with each toy. 	<p>and merely asks “Whose toy is it?”</p> <ul style="list-style-type: none"> • After all the presents have been distributed, review what the girl and boy can do with each toy.
Activity Two	<p><u>Target:</u> Negation</p> <ul style="list-style-type: none"> • Continue to pretend it is a birthday party. Play a “matching game” with construction paper presents. Each present has a picture of one of the ten toys found in the previous activity glued on it, and each toy appears on a present twice. • Place all the presents face down. As the child turns over two presents, they can say “They match” or “They <i>do not</i> match”. Review what you can do with each toy as you find it. Wave your finger to promote the use of negation. 	<p><u>Target:</u> Negation</p> <ul style="list-style-type: none"> • Continue to pretend it is a birthday party. Play a “matching game” with construction paper presents. Each present has a picture of one of the ten toys found in the previous activity glued on it, and each toy appears on a present twice. • Place all the presents face down. As the child turns over two presents, they can say “They match” or “They <i>do not</i> match”. Review what you can do with each toy as you find it. Wave your finger to promote the use of negation.
Activity Three	<p><u>Target:</u> Prepositional phrases: in front, behind, beside, etc.</p> <ul style="list-style-type: none"> • These prepositions were targeted through reading the book in the introduction activity 	<p><u>Target:</u> Prepositional phrases: in front, behind, beside, etc.</p> <ul style="list-style-type: none"> • Play “Prepositional Bingo” (a game where each Bingo square shows common toys and objects behind/in front of/beside other objects) • As they come up in the game, use the images on the Bingo board to practice the using the prepositions to describe the images
Homework	<ul style="list-style-type: none"> • ask the child to cut out and glue pictures of toys from magazines that they like on one page of their language book and toys that they DO NOT like on another page. Encourage them to practice “I like _____” and “I do not like _____”. • Encourage the child to talk about what they can do with each toy (action word vocabulary). • Encourage the child to also clap out the syllables for all the toys that he likes. 	<ul style="list-style-type: none"> • ask the child to cut out and glue pictures of toys from magazines that they like on one page of their language book and toys that they DO NOT like on another page. Encourage them to practice “I like _____” and “I do not like _____”. • Encourage the child to talk about what they can do with each toy (action word vocabulary). • Provide families with the matching game cards from negation activity so they can repeat this activity at home

Appendix D

Book Titles, Learning Domains & Literacy Objectives for the 12-week Literacy-
Enhanced Experimental Intervention

LEARNING DOMAINS:
Print Knowledge
Vocabulary Skills
Phonological Awareness
Narrative Skills

SESSION:	BOOK TITLE:	ACTIVITY #:	LITERACY OBJECTIVES:
1	Chicka Chicka Boom Boom	1 & 2	-recognition of print carrying message of story -use of colour names
2	Chicka Chicka Boom Boom	3 & 4	-identification of rhyme -description of setting, characters & events
3	Sheep Take a Hike	1 & 2	-recognition of print carrying message -comprehension and use of new nouns
4	Sheep Take a Hike	3 & 4	-identification of rhyme, -description of setting, characters & events
5	The Letters Are Lost	1 & 2	-recognition of left-right directionality -comprehension and use of verbs
6	The Letters Are Lost	3 & 4	-syllable segmentation and blending -recall of 3+ events in a story
7	Spot's Birthday Party	1 & 2	-recognition of left-right directionality -comprehension and use of prepositions
8	Spot's Birthday Party	3 & 4	-syllable segmentation and blending -recall of 3+ events in a story
9	Growing Vegetable Soup	1 & 2	-letter naming -comprehension and use of adjectives
10	Growing Vegetable Soup	3 & 4	-syllable segmentation and blending -recall of 3+ events in a story
11	The Mitten	1 & 2	-letter naming -comprehension and use of new animal vocabulary
12	The Mitten	3 & 4	-identification of initial sounds -recall of 3+ events in a story

Appendix E

Traditional Therapy Checklist for Activities to be Used in Control Group Sessions

Traditional Therapy Includes:

- ☐ Games/structured activities
- ☐ Books for bombardment, sequencing, narratives
- ☐ Drill work/cards
- ☐ Hierarchy of tasks: bombardment
 - ☐ Discrimination
 - ☐ Words
 - ☐ Phrase
 - ☐ Sentences
 - ☐ Conversation carryover (natural talking)
- ☐ May include themes
- ☐ Label names under pictures of words
- ☐ May include crafts/toys/books for carryover/conversation

Does NOT Include:

- ☐ Book reading focused on print, the setting, characters, etc.
- ☐ Alliteration
- ☐ Segmenting
- ☐ Rhyming
- ☐ Letter recognition
- ☐ Letter/sound correspondence

Appendix F

Samples of Standardized Literacy Homework for Children in the Experimental Group

Session 1

Target: Print Awareness

What to do this week:

- Before reading the book to your child, read the **title** of the book and point to **each word** as you read it. Explain that this is the ‘name’ of the story, or the title.
- Ask your child if he/she can find the **words** on the first page, which you are about to read (as distinct from the pictures)
- As you read the book, **follow each word with your finger**. Make a point of telling your child that you start reading over here (on the left) and move along to the right side of the page.

You can repeat this activity for other books that you may be reading to your child during the week.

Session 3

Target: Introducing New Words Into Your Child’s Vocabulary

What to do this week:

- As you read the homework book together, or another book of your child’s choice, point out a few words which may be new to him/her and give a **brief explanation**.
- They may be **names of things** (eg. *Yak* – “That’s an animal that looks a bit like a bull”) or **descriptive words** (eg. *Plaid* – “That’s a pattern made with different coloured lines, like the one in the picture”) or **action words** (eg. *Creating* – “That means that they are making something”) or **other types of words** (eg. *Boldly* – “That means that they felt very brave and they weren’t scared at all when they went up to the cave”).
- At the end of the story **re-visit** some of the new words which you explained to your child, showing the relevant pictures if possible and see if he/she can remember something about them (eg. “Do you remember what we do with an xylophone?”)

You can repeat this activity for other books that you may be reading to your child during the week.

Appendix G

Brock University Research Ethics Board Approval

DATE: February 11, 2008

FROM: Michelle McGinn, Chair
Research Ethics Board (REB)

TO: John McNamara, Child and Youth Studies
Sherri-Leigh Vervaeke

FILE: 07-242 MCNAMARA/VERVAEKE

TITLE: Exploring the emergent literacy Needs of Preschoolers with Language Impairments

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: Request for secondary use of data accepted

This project has received ethics clearance for the period of February 11, 2008 to December 31, 2008 subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The clearance period may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and cleared by the REB. During the course of research no deviations from, or changes to, the protocol, recruitment, or consent form may be initiated without prior written clearance from the REB. The Board must provide clearance for any modifications before they can be implemented. If you wish to modify your research project, please refer to <http://www.brocku.ca/researchservices/forms> to complete the appropriate form Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

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

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form *Continuing Review/Final Report* is required.

Please quote your REB file number on all future correspondence.

MM/kw

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