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Sentence Recall in Monolingual and ELL with and without Parental Concerns about Language Development

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Science
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SENTENCE RECALL IN MONOLINGUAL AND ELL WITH AND WITHOUT PARENTAL CONCERN ABOUT LANGUAGE DEVELOPMINT

(SPINE TITLE: SENTENCE RECALL IN MONOLINGUAL AND ELL WITH AND WITHOUT PARENTAL CONCERN ABOUT LANGUAGE DEVELOPMINT)

(Thesis format: Monograph)

by

Areej M. Balilah

Graduate Program in Health and Rehabilitation Science

A thesis submitted in fulfillment of the requirements for the degree of Master of Science

The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

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Master of Sciene

Abstract

Sentence recall has been identified as a potential clinical marker of Specific Language Impairment (SLI). The extent to which sentence recall may be useful in distinguishing children with SLI from English Language Learners (ELL) has not been examined. Despite tapping existing language knowledge, sentence recall may be sufficiently sensitive to reveal differences between these groups. In the present study, 1253 school age children completed a sentence recall task and their parents declared whether their first language was English and whether there were any concerns about language development. Given the lack of a "gold standard" in identifying language impairment in bilingual groups, parental concern was used to compare four groups: (1) monolingual-no-parental-concerns; (2) monolingual-with-concerns; (3) ELL-no-concerns; (4) ELL-with-concerns. The results indicated that the monolingual-no-concerns group recalled sentences more accurately than all remaining groups while the ELL-with-concerns group performed least well. Interestingly, the monolingual-with-concern group and the ELL-no-concern group achieved almost identical mid-range scores. The developmental consistency of these findings was striking.

Keywords: Language development, Specific Language Impairment, English Language Learners, sentence recall, second language acquisition, and clinical markers.

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Chapter 1

General Introduction

Most children learn language effortlessly, moving seamlessly from speaking first words to becoming sophisticated language users. By school entry, children have typically developed an impressive master native language, but this is not the case for all. Some children fail to learn their native language despite having otherwise typical development (e.g., an absence of neurological, emotional, or sensory deficits, and having average opportunities). These children have specific language impairment (SLI). They may struggle to understand and produce language as well as their peers in school (e.g., Dale, Price, Bishop, & Plomin, 2003; Paul, 1991, 1993; Paul & Smith, 1993; Rescorla & Schwartz, 1992; Roulstone, Peters, Glogowska, Enderby, 2003), and many will need to receive intervention (Leonard, 1998). Another group of school-age children whose language abilities appear to fall below that of their peers is children receiving instruction in a language other than their first language. These children learning the language of instruction as a second language - typically English in many Canadian sites - can be referred to as English Language Learners (ELL). Differentiating these two groups of children (SLI and ELL) with language differences is a challenging, but important problem. Distinguishing these groups is important to our understanding of language development, our ability to identify children struggling with language, and in providing appropriate intervention. Recently, tasks highly sensitive to language differences in children have been described. For example, the ability to repeat a sentence immediately after hearing is known as *sentence recall* and has been identified as a potential clinical

marker of SLI (Cont-Ramsden, 2003; Cont-Ramsden, Botting, & Faragher 2001). The extent to which sentence recall may be useful in distinguishing children with SLI from those learning English as a second language has not yet been examined. This thesis examines the problem of distinguishing these SLI and ELL groups, and the utility of sentence recall as a measure discriminating them.

Specific Language Impairment

While many children follow the usual pattern of language development, this is not the case for all developing youths. Some children struggle to learn their native language and face many language-related problems. Early observations of such children show that they learn their respective languages at a slower rate than their typically developing peers (Leonard, 1998). Despite their struggling language skills, children with an impairment specific to language do not express other observable developmental problems such as mental retardation, neurological damage, hearing impairment, oral motor deficits, or low non-verbal intelligence test scores (Bishop, 1987; Gauger, Lombardino, & Leonard, 1997; Rebolledo, Prieto, Henao, Restrepo, & Salvador, 2004).

According to Leonard (1998), children who have a significant and relatively specific impairment in their language ability are considered to have a specific language impairment (SLI). SLI is estimated to occur in approximately 7% of kindergarten children (LaParo et al., 2003; Tomblin, Records, Buchwalter, Zhang, Smith & O'Brien, 1997), and is more prevalent in males than females with an approximate 2.8:1 male to female ratio across studies (e.g., Robinsons, 1987; Tomblin et al., 1997; Choudhury & Benasich, 2003; Flax, Realpe-Bonilla, Hirsch, Brzustowicz, Bartlett, & Tallal, 2003). In

many cases, children with SLI have parents or relatives with a history of language deficits (e.g., Leonard, 1998; Choudhury & Benasich, 2003; Tomblin, 1989).

Although it is possible that treatment could help children with SLI to improve their language ability, it may not be easy to achieve. The language impairment often affects many aspects of their lives persisting throughout later childhood, adolescence, and in some cases, even adulthood (Bishop & Edmundson, 1987; Tomblin, Zhang, Buckwalter, & O'Brien, 2003; Aram, Ekelman, & Nation, 1984; Johnson, Beitchman, Young, Escobar, Atkinson, et al., 1999; Snowling, Adams, Bishop, & Stothard, 2001; Snowling, Bishop, & Stothard, 2000; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). Naturally, language deficits due to SLI affect children's academic achievement at school, especially in reading (Catts, Fey, Tomblin, & Zhang, 2002; Flax et al., 2003; Snowling et al., 2000) and writing (Bishop & Clarkson, 2003; Fey et al., 2004; Mackie & Dockrell, 2004). Beyond academic performance however, the limitations to language ability caused by SLI can affect children's general social well-being (Gertner, Rice, & Hadley, 1994).

The Criteria of Children with SLI

As language problems can be a common co-occurrence in many different kinds of developmental impairments such as Autism Spectrum Disorder (ASD), Asperger's Syndrome, and Developmental Coordination Disorder (DCD) (Schaeffer, 2003; Leonard, 1998), researchers and speech and language pathologists distinguish between SLI and other impairments through the use of specific criteria. Confidently identifying a child with SLI itself remains difficult however, because children with SLI are a heterogeneous group. Within the categorization as SLI, these children have different language profiles

and have differing strengths and weaknesses in the many facets of language (Leonard, 1998).

Measures of language ability. The standardized measure of language ability is one of the common methods employed by researchers and speech and language pathologists to identify children with SLI. According to Leonard (1998), standardized tests are a good starting point to determine a child's language ability. Standardized testing shows that children with SLI illustrate a deficit in tested areas of language ability compared to typically developing (TD) children. However, one of the problems with using standardized tests is that they do not assess all of the areas of language that could potentially be areas of weakness for children with SLI. Furthermore, in some cases the language areas covered by standardized tests are not representative of the language used on a day-to-day basis by children (e.g., Muma, 1986; Leonard, 1998).

Most of the standardized tests employed for the purposes of identifying SLI cover two important areas: comprehension and expression/production. The Test of Language Development-Primary, 2nd edition (TOLD-P:2) (Newcomer & Hammil, 1991) is one such test that has been used in many studies identifying children with SLI (e.g., Leonard et al., 1992; Tomblin, 1966b). An influential study by Records and Tomblin (1994) revealed high agreement between clinician's judgments of SLI and test results for children who scored at least 1.25 standard deviations below the mean on the TOLD-P:2.

As an alternative to using standard scores, a child's language age can identify whether or not he or she has a language impairment (LI) (e.g., Lahey, 1990; McCauley & Swisher, 1984). Children who are at least six months below age expectations for

language comprehension with at least one year below expectations in language production may be considered to have a language impairment.

Another measure that is used to judge children's language ability is the mean length of utterance (MLU), which has been widely employed by researchers. MLU data are collected based on samples of children's spontaneous speech. According to Leonard (1998), using MLU alone to identify children with SLI is rare; instead, results from MLU testing are usually considered simultaneously with standardized test data. Duna, Flax, Sliwinkki and Aram (1996) did however find that MLU is more consistent with the clinical diagnoses of children with SLI than many other language tests.

Nonverbal intelligence. Average scores on a nonverbal intelligence test is considered an important criterion to identify children with SLI (Stark & Tallal, 1988). In theory, a discrepancy between language and nonverbal intelligence should identify children with specific difficulties in language who otherwise have average intelligence. Age expected performance is revealed by standard scores of at least 85, or less than 1 SD below the mean. As a consequence, children with SLI have a clear gap between their nonverbal IQ and their language score. It should be noted that concern has been raised about this criterion (Snyder, 1982; Aram, Hack, Hawkins, Weissman, & Borawski-Clark, 1991) for several reasons. One problem is that these measures are subject to some measurement error, and as a result the discrepancy may not be accurate (Lahey, 1990). In addition, groups of children with language impairment whose nonverbal intelligence scores fall either above or below the cut off have not been found to differ in several studies (Cole, Dale, & Mills, 1990; Fey, Long, & Cleve, 1994) suggesting that this criterion does not identify meaningfully different groups.

Hearing sensitivity. Language deficits in children with SLI are not tied to hearing impairment. Most children with SLI pass a hearing-screening test (pure tones presented at 20 dB in each ear at the frequencies 500, 1000, 2000, and 4000 Hz).

Loeb and Leonard (1991) excluded from their study children who have had Otitis Media with Effusion (OME) for a period of twelve months due to the fact that OME is a disease that can cause children's hearing loss for a period of time. Friel-Patti and Finitso (1990) assert that spoken language learning can be affected if the child has had a period of hearing loss. It should be noted however that OME is not considered to be one of the fundamental causes of SLI (Bishop & Edmundson, 1986), nor is it a standard criterion employed in identifying SLI (Stark & Tallal, 1988).

Neurological status. Presence of a neurological condition is an exclusion criterion for SLI because many neurological conditions can be reason alone for having language impairment. Focal brain lesions, traumatic brain injury, cerebral palsy, seizure disorders, and Landau-Kleffner syndrome are all examples of such neurological conditions. Children who have mild neuromaturational delays however are not ruled out from the criteria of being considered SLI; in fact, there are many children with SLI who have shown to have relatively slow motor responses (Bishop, 1990; Bishop & Edmundson, 1987a; Noterdaeme, Amorosa, Ploog, & Scheimann, 1988; Powell & Bishop, 1992; Stark, & Tallal, 1988; Tallal, Dukette, & Curtiss, 1989). Additionally, limitation in attention is another trait observed by researchers in children with SLI (Baker & Cantwell, 1982, Mackworth, Grandstaff, & Pribram, 1973; Tallal, Dukette, & Curtiss, 1989; Townsend, Wulfeck, Nichols, & Koch, 1995).

Oral structure and function. Children who have problems with oral structure are ruled out from the criteria of SLI as such problems can affect the child's language production (Leonard 1998). For that reason, any test used in the diagnosis of SLI must include an evaluation of oral ability. Oral movements that should be evaluated include rounding the lip, sealing the lips, biting down on the lower lip, protruding the tongue, and moving the tongue from one side of the mouth to the other. Robbins and Klee (1987) found that by age 3;6 children should be able to control the developmental function for most oral movements well .

Social interaction. Children who show symptoms of impaired reciprocal social interaction or a limited range of activities are generally excluded from the criteria of SLI (e.g., Leonard, 1998; Tager-Flusberg & Cooper, 1999). It is not surprising however, that children who have a limitations in their language ability can exhibit social skill difficulties (McConnell & Odom, 1986). Craig (1993) and Jerome, Fujiki, Brinton, and James (2002) found that children with SLI are at a disadvantage for establishing relationships with peers. Children with SLI may also face difficulties in initiating social interactions (Craig & Washington, 1993; Gallagher, 1993, 1999), participating in ongoing interactions (Hadley & Rice, 1991) and resolving conflicts during social interactions (Brinton, Fujiki, & McKee, 1998; Brinton, Fujiki, Spencer, & Robinson, 1997). Stanton-Chapman, Justice, Skibbe, and Grant (2007) examined the social and behavioral characteristics of preschool children with SLI. The study compared typically developing children with SLI on two measures: the Social Skills Rating System (Gresham & Elliott, 1990) and the Child Behavior Checklist (Achenbach, 1995). The results indicated that

there is a significant difference between the two groups of children in the area of social skills, but not for behavioural problems.

The Language Characteristics of SLI

In general, the language deficits in English-speaking children with SLI may affect all areas of language compared to their same-age peers. Evidence for language limitations in children with SLI comes from children's data of language areas described in many language studies (e.g., lexical, morph syntactic, phonological and pragmatic). It should be noted however that the majority of available research pertains to the British and American English dialect.

Lexical ability. From an early age, children with SLI acquire their first words later than their same-age peers. Trauner, Wulfeck, Tallal, and Hesselink (1995) found that according to parental reports, children with SLI acquire their first words at an average age of almost 23 months, compared to typically developing children who speak at 11 months. Nevertheless, children with SLI were found to use the same types of words that are observed in younger normal children's speech (Trauner et al., 1995). Children with SLI have also been found to use a smaller variety of verbs and have a smaller mean length of utterance than their age controls (Fletcher & Peters, 1984; Watkins, Rice, & Molz, 1993).

"Fast-mapping" is the ability to associate a word and its referent after only one or two exposures to the word; it is a phenomenon that appears in the preschool years and has received attention from many investigators. Rice, Buhr, and Nemeth (1990) examined the overall mapping ability on a comprehension task in five-year-old children with SLI. The task included five unfamiliar names in four different categories: object, actions,

attributes, and affective words. Children with SLI showed a limited mapping ability compared to similar-age control children as well as MLU controls. All groups of children (especially those with SLI) found the action category of names to be the most difficult, a finding that has received support from many other studies (e.g., Rice, Oetting, Marquis, Bode, & Pae, 1994; Oetting, Rice, & Swank, 1995). In general, preschool children with SLI show a lexical ability that matches that of MLU controls, however verbs still tend to be an area of difficulty for children with SLI.

The term "word-finding problem" is often used in literature describing lexical limitations in school-aged children with SLI. Word-finding problems also referred to as lexical look-up problems (Menyuk, 1975, 1978) or delayed speed of word retrieval (Schwartz & Solot, 1980), describe a difficulty in retrieving a previously-learned words for use in other situations (e.g., German, 1987; McGreger & Leonard, 1995; Rapin & Wilson, 1978; Weiner, 1974) "Naming errors" (saying the wrong label for a known word) appear frequently alongside word-finding problems in children with SLI. In picture-pointing tests, children with SLI make more naming errors compared to their same-age control group (Rubin & Liberman, 1983; Wiig, Semel, & Nystrom, 1982). According to Leonard (1998), one possible explanation for this problem could be that the correct word is present in the child's memory, but the child uses ineffective ways of accessing it. Another explanation for the deficit could be that words have a network of association in memory and some words simply have a richer and stronger network of association than other words (Leonard, 1998). Words can be connected in semantic, grammatical, or phonological ways in memory. Words that are more frequently used can have a stronger network of association than words that are less frequently used.

Consequently, the easier and faster a word can be retrieved, the richer and stronger its network of association is.

Early word combinations have received attention from investigators; it was found that children with SLI show a delayed ability in forming their first word combinations when compared to normally developing children. Trauner et al. (1995) found that the average age for initial word combination was almost 37 months for children with SLI compared to 17 months for normally developing children. However, the early word combinations in children with SLI have largely not been found to differ from MLU controls (Leonard, Steckol, & Schwartz, 1978; Trauner et al., 1995).

Syntactic structure. Morehead and Ingram (1970, 1973) compared children with SLI aged 5 to 8 years with children aged 20 months to 3 years matched on MLU. Compared to an MLU control group, these researchers found that young children with SLI showed limitations in the number of sentence contexts in which they used major syntactic categories (e.g., noun, verb, embedded sentence). Grammatical morphology is a subject that has received much attention from investigators as a part of morphosyntactic ability in children. From an early age, children with SLI show a significant limitation in grammatical ability; grammatical morphology is considered a specific area of difficulty for children with SLI (e.g., Leonard, 1989; Schmauch, Panagos, & Klich, 1978; Steckol, & Leonard, 1979). Evidence from a series of studies showed that children with SLI use several grammatical morphemes (e.g., auxiliary, copula *be* forms, noun plural *–s*, genitive *'s*, infinitive *to*, and articles) less than MLU controls (Ingram, 1972b; Steckol & Leonard, 1979; Leonard, Eyer, Bedor, & Grela, 1997). Rice, Wexler, and Cleave (1995) found that children with SLI have a significant deficit in the use of regular past, third-person

singular, the copula and auxiliary *be* form, and the auxiliary *do* form than MLU controls. Albertini (1980) followed two groups: preschool-age children with SLI and a control group whose MLUs ranged from 1.5 to 2.1 morphemes. After six months, the MLU controls showed an improvement in the use of progressive–*ing*, plural-*s*, *in*, *on* and gentive*'s*. On the other hand, children with SLI only showed improvement in the use of *in* and *on*. In examining types of grammatical morphemes, Ingram (1972b) found that, in general, omission errors were more frequent in the speech of children with SLI (e.g., omission of copula and auxiliary *be*).

Nominative case pronouns (e.g., I, he, she, and they) are another area of grammatical morphology that has received attention from investigators. Children with SLI show a higher frequency of using accusative words for nominative case pronouns (e.g., him eating ice-cream) than younger normally development controls. (Loeb & Leonard, 1988; Leonard 1982a; Lee, 1966; Menyuk, 1964).

Another area of grammar that has been found to be difficult for children with SLI is grammatical morpheme judgment. Children with SLI are reported to be more accepting of sentences with grammatical errors (e.g., missing past tense) than controls groups matched on language ability (Van der Lely & Ullman, 1996). An additional study that examined children's grammatical judgment ability also showed that children with SLI aged 7 to 14 years accepted a higher number of grammatical errors than age-controls. In addition, children with SLI showed a slower response time in making their grammatical judgment for sentences compared to age-controls (Wulfeck & Bates, 1991).

Phonology. According to many investigators (e.g., Paul & Shriberg, 1982; Ruscello, St. Louis, & Mason, 1991; Shriberg, Kwiatkowsk, Best, Hengst, & Terslic-

Weber, 1986), preschool-age children who have problems with morphosyntax and lexical skills are likely to have phonological problems as well (problems with the sound system of the language). Similarly, children who exhibit phonological problems are expected to have problems in other areas of language. A common way to examine phonological ability in children with SLI is to look at their segment, which describes the accuracy of each consonant and vowel. Children with SLI show a delay in acquiring speech segments relative to typically developing children, although the pattern of development mirrors that of typical development (e.g., Farwell, 1972). Investigators who examined the use of vowels noted that the same vowels that cause difficulty for normally developing children are used with limited accuracy by children with SLI. Catts and Jensen (1983) found that children with SLI produce voicing contrasts (e.g., *coal-goal*) with less accuracy compared to their age-peers. Research on the speech of normally developing two-year-old children illustrates that processes occurring with high frequency (e.g., consonant cluster reduction, liquid gliding, final consonant deletion, and word-initial weak syllable deletion) appear to be more prevalent in the speech of children with SLI (Edwards & Bernhardt, 1973; Hodson & Paden, 1981; Ingram, 1976, 1981; Leonard, 1982b; Schwartz, Leonard, Folger, & Wilcox, 1980). According to Fee (1995), a minority of individuals who have SLI continue to have some phonological process problems into adulthood.

Pragmatics. Pragmatics is the study of the way people use language in actual conversations. In the study of children with SLI, investigators looked to the speech act ability in these children. In single-word utterances, Synder (1975, 1978) found that children with SLI are more likely to use requestive and declarative functions through

gestural means than younger normally developing children who use words to convey requestive and declarative functions. Similarly, in multi-word utterances, the speech act used by children with SLI shows a greater deficit than age-controls (Prinz, 1982). In fact, the speech act of children with SLI seems to be well matched with that of younger normally developing children (Prinz & Ferrier, 1983).

Conversational participation and discourse regulation abilities in children with SLI also received attention from researchers. The conversations of children with SLI were assessed for abilities such as conversational initiations and replies, turn taking, and repairing utterances based on listener feedback or interruption. When compared to same-age peers, children with SLI are less likely to initiate conversations when speaking to adults (Sheppard, 1980; Siegel, Cunningham, & Ran der Spuy, 1979; Stein, 1976; Watson, 1977). In contrast, when children with SLI interact with children with a similar MLU, they appear to lead the conversation more than when they interact with same age-peers (Fey, Leonard, & Wilcox, 1981). Jacobs (1981) found that children with SLI are more conversationally assertive when they talk with other children with SLI than when they interact with normally developing children of the same age. Craig and Washington (1993) and Craig (1993) reported that even when children with SLI appear to interact easily with others, interaction with more than one normally developing child can be difficult for children with SLI. In a classroom setting, Rice, Sell, and Hadley (1991) found that children with SLI like to initiate interactions with adults more than normally developing children, who prefer to interact with other peers rather than adults.

Some other important measures of conversational participation are topic maintenance, repairing utterances, and paraphrasing sentences. Compared to normally

developing children, children with SLI appear to change the topic more quickly in their conversations (Schelletter, 1990). In addition, Fujiki, Brinton, and Sonnenberg (1990) reported that children with SLI produce their utterances with less preparation than age-peers or younger normally developing children matched on language ability. Finally, Hoar (1977) reported that children with SLI show a limitation in the ability to paraphrase sentences and a limited syntactic reformulation ability compared to same-age-peers.

Narrative ability. Narrative ability, or the ability to tell a story, is an important communicative skill requiring the coordination of lexical, morphosyntactic, phonological, and pragmatic elements. Research (e.g., Candler & Hildreth, 1990; Crais, 1988; Clifford, Reilly, & Wulfeck, 1995; Graybeal, 1981; MacLachlan & Chapman, 1988; Newcomer, Barenbaum, & Nodin, 1988; Strong & Shaver, 1991) illustrates that certain missing details in the narrative data of children with SLI can make their speech incoherent and less complete. An in-depth study of narrative ability in children with SLI by Gillam and Johnston (1992) showed that children with SLI produce narratives that are similar to those produced by younger, normally developing children. However, children with SLI produce more grammatical errors than these younger controls. Leonard (1998) surmises that the significant limitations in grammatical ability of children with SLI greatly affects their narrative ability.

In conclusion, language profiles for children with SLI can differ from child to child. However, most researchers agree that some areas of language are considered to be the most difficult for children with SLI. Children with SLI show a strong limitations in the area of morphosyntax when compared to same-age peers. More specifically within

the category of morphosyntax, grammatical morphology is a difficult area for children with SLI. In contrast, in most cases, pragmatic abilities are less affected.

English Language Learners (ELLs)

Families leave their country of birth and migrate or live for a period of time in other countries for many reasons. As a result of their move, children from these families often have a first language (L1) that is different from the majority language of the community where they live and grow up. Moreover, children who have a L1 different than the majority language, English (in the case of Canada), usually attend school where English is the language of instruction. Children from minority ethnolinguistic communities who live in a majority English community and attend school where English is the language of instruction are commonly referred to as *English Language Learners* (ELL) (or alternatively, English learners, English as a second language/English as an additional language learners).

The number of children who are educated in a language other than their L1 (i.e., in their second language, L2) in Canada and the USA is not a small number. According to Statistics Canada (2003), of the 1.8 million immigrants who arrived in Canada during the 1990s, 309,700 (17%) were school-aged children and youths between 5 and 16 years old. In addition, many Canadian-born children (approximately 10.5% of the population) live in a home where a language other than English or French is spoken (Statistics Canada, 2002). In the USA, the number of children who speak a language other than English at home grew from 3.8 million to 10.6 million between 1979 and 2005 (US Department of Education, 2007). Interestingly, there is an expected rise in the number of ELL in the future; according to Zahr, and Mary Ann (2005), ELL is the fastest-growing student population in the USA. The study proposed that by 2025, one in four American students could be an ELL.

Generally, L2 development has been described using four stages (Patton Tabors, 2008). In stage 1, which lasts for a very short time ranging from a few days to a few months (Savillle-Troike, 1987), ELL use their L1 in English-speaking environments, however, certain ELL do not speak their L1 during this time at all. During the second stage, ELL start to acquire their L2, but they produce very few English words. Stage 3 corresponds to when ELL begin to produce some of their L2 words. Theses are often one-word utterances like object or color names used in place of full sentences (Patton Tabors, 2008). In stage 4, ELL start to use their L2 knowledge to produce real sentences and they also start to develop some fluency in their L2. Foreign accents, errors in vocabulary choice, and errors in grammatical morphemes may persist in the L2. Moreover, individual differences in L2 proficiency between ELL can become very apparent at this stage. The time it takes to reach stage 4 can vary widely with some children reaching stage 4 within one school semester/term, and others taking more than a year to reach this stage.

The Language Characteristics of ELL

To understand the language characteristics of ELL, one needs to consider the various factors related to language development in ELL including developmental patterns, typical errors, and time to acquisition. For example, review of the developmental patterns of English in ELL can clarify how their L2 develops. Moreover, illustrating the typical errors patterns of second language development in ELL can provide a better understanding of the language limitations of ELL. In addition, understanding how long it takes ELL to attain native-speaker proficiency in a language can be very important for teachers and clinicians involved in assisting ELL.

Developmental patterns in English L2. Developmental patterns in ELL appear to parallel the developmental pattern of younger English-speaking monolingual children (Genesee et al. 2004). Dulay and Burt (1973, 1974), for example, found that ELL (Spanish L1 and English L2) first acquire plural *–s* then possessive –'s in English just as their English L1 group. It is possible and likely, however, that acquiring an L2 takes longer and is more challenging (Tabors, 1997; Van Lier, 1999).

The lexical developmental patterns in English monolingual, children show that they initially use what are referred to as *general all-purpose* (GAP) words in their speech. Verbs such as *do* have a flexible meaning, and are common in the early language of English monolingual children. Similarly, Golberg, Paradis, and Crago (2008) found that ELL in the early stage of learning English, also use *do* as a GAP verb in their speech. Further lexical development mirrors L1-learners with some exceptions related to the nature of respective L2s. These factors will be discussed in the typical error patterns section below.

In terms of grammatical morphemes, English monolingual children tend to master certain morphemes before others (e.g., plurals *-s* and progressive *–ing* before past tense *–ed*, and third-person singular *–s*) (Haznedar, 2001; Jia & Fuse, 2007; Paradis, 2005, 2008; Paradis, Rice, Crago, & Marguis, 2008). Paradis (2005) found that after approximately 10 months of exposure to English, examination of ELL's spontaneous speech revealed use of plural *–s* almost 71% of the time, and the use of past tense *–ed* about 22% of the time. Once again, this pattern mirrors L1-development.

Typical errors patterns. Many researchers have attempted to detail the error patterns typical of ELL. For example, in terms of phonology, consonant clusters are

considered to be an area of difficulty and develop later for English monolingual children. In general, English monolingual children tend to omit one of the consonants in a cluster thereby easing the motor demands (e.g., *play* as */pei/*). ELL similarly show this phonological error (Gilhoo, Burrows, Goldstein, & Paradis, 2009; Sorenson Duncan, Tessier, & Paradis, 2009).

Moreover, ELL who are in the early stages of acquiring grammatical morphemes in English may produce a significant amount of grammatical morpheme errors in their speech (about 80% of the time). This percentage of grammatical morpheme errors can decrease as the child gains more experience with English. However, mastery of the grammatical morpheme is not easy for ELL to achieve, and it takes time for them to reach proficiency. ELL may initially use a grammatical morpheme inconsistently. Even when they achieve mastery of the English grammatical morphemes, they may still produce errors from time to time (Paradis, 2005; Paradis et al., 2008).

In summary, ELL's earliest speech may contain mispronounced words or missing grammatical morphemes (verbal and nominal inflection like plural *–s*, past tense *–ed*, and freestanding function words like articles *the, a* or auxiliary verbs). As a result, the speech of ELL in the early stages of acquiring their L2 may sound abbreviated, or "telegraphic." This formulaic and telegraphic language used by ELL is considered to be a part of the normal process that most ELL will go through (Patton Tabors, 2008).

Time to acquisition. It appears that L2 learners do not reach native-speaker proficiency in all linguistic domains at once. Each domain of language such as phonological, morphosyntactic, and vocabulary show a different developmental pattern. For example, Oller et al., (2007) compared English L2 children (with a Spanish L1) to

their English monolingual peers. The results indicated that there was no difference between the groups on word-decoding skills. However, ELL children remained behind their monolingual peers in terms of English vocabulary.

Similarly, Paradis (2005) studied 25 ELL children over two years examining the children's language ability every six months using the following measures: receptive vocabulary size, verbal morphology, and narrative structure. From the overall pattern, the study found that L2 learners approached native-speaker performance in narrative structure before vocabulary, while verbal morphology appeared to develop later in ELL.

Length of time before ELL attain native-speaker proficiency. The length of time before ELL approaches native-speaker proficiency in each linguistic domain (e.g., phonological, morphsyntactic, and vocabulary) has been addressed in many independent studies. For instance, in terms of phonological development, Paradis (2005) found that even for younger ELL, it could take more than two years to achieve native-like pronunciation in English (see Gilhool, Burrows, Goldstein, and Paradis, 2009). In addition, in terms of morphosyntactic development, Jia (2003), Jia and Fuse (2007), and Paradis (2008) examined English L2's acquired English grammatical morphemes over time. Results of these studies indicated that ELL can take between 3 to 5 years to acquire verbal inflections (see also Zdorenko and Paradis, 2008; Hakuta, Goto, Butler, and Witt, 2000). Finally, in terms of vocabulary development, Golberg et al. (2008) measured receptive vocabulary size in 19 ELL children over two years. Interestingly, the study found that the gap between ELL and their monolingual peers closed after three years of schooling in English (see Oller and Eilers, 2002).

Children's rate of english development. After reviewing numerous L2 studies, Saunders and O'Brien (2006) found that the rate of English development in ELL changes over time. ELL showed rapid growth in their language proficiency until grade three, after which their language development progressed at a slower rate for their remaining elementary school years. As a result, ELL can take two or more years to catch up to their English-speaking monolingual peers.

Factors Affecting Second Language Acquisition in Children

School-age children whose home languages are not English often have their first significant experiences with English when they begin school. Despite overall similar patterns, there is considerable individual variation in the rate at which children acquire a second language. Studies show that there are many important factors that can lead to individual differentiation among ELL (e.g., Paradis, 2007; Saunders & O'Brien, 2006). Some of these factors are child-internal such as motivation, personality, social interaction, age of English acquisition, and the structure of their first language (Dulay & Burt, 1974; Genesee et al. 2004; Ranta, 2002; Wong-Fillmore, 1979, 1983). Other factors are child-external, meaning it is a child's environment that impacts his or her language development. For example, the quantity and quality of L2 exposure, family background, prior literacy, and language experiences are all child-external factors (Gutierrez-Clellen & Kreiter, 2003; Patterson, 2002; Person, Fernandez, Lewedege, & Oller, 1997; Paradis, Genesee, & Crago, 2004). Analyzing the importance of these factors could be critical in better understanding ELL. The remainder of this section will examine influences on ELL related to cognitive factors, language aptitude factors related to L1 and to experience with L2, and personality and social interaction.

Cognitive factors. General intelligence includes abilities such as learning new skills and knowledge, solving problems, and thinking analytically and rationally (e.g., Wechsler, 1944). Tests of general intelligence have been found to be highly related to reading and writing skills. As a result, these tests have been correlated with aspects of language proficiency and language proficiency generally in monolingual children (e.g., Paradis et al., 2008; Umek, Socan, Bajc, & Peklaj, 2008). Likewise, Genesee (1976) found the same pattern in the acquisition of a second language in bilingual children. Genesee (1976) studied three grade levels (4, 7, and 11) using standardized IQ tests and a battery of language tests which included subtests of reading, language usage, listening comprehension, and interpersonal communication skills. Results indicated that children's IQ levels correlate with their scores on reading and language use. However, children's scores on listening comprehension and interpersonal communication skills were not correlated with IQ. Genesee (1987) investigated the relationship between children's performance on general intelligence and speaking and listening comprehension (oral language skills) in their L2. The study found that the children's performance in L2 speaking and listening was not significantly correlated with the measure of general intelligence. General intelligence measures, therefore, are considered to be a good predictor for children's performance in reading and writing in their L2, but alone, they may not be a significant predictor for L2 oral language skills (Genesee et al. 2004; Paradis, 2010).

Language aptitude. Language aptitude is similar to, but different than Intelligence Quotient (IQ); individuals can differ in their language aptitude ability just as they do in their IQ ability. Language aptitude is an individual's ability to succeed in

learning a new language, and may depend on four factors including phonemic coding ability, grammatical sensitivity, associative memory, and inductive language learning ability (Carroll & Sapon, 2000; Skehan, 1998). For example, skills such as repeating unfamiliar sounds and analyzing parts of speech in written language (nouns, verbs, adverbs, and adjectives) are very important for ELL. Paradis and colleagues (Paradis, 2010; Genesee et al. 2004) studied 155 ELL children ranging from 5-6 years old, and found that both phonological memory ability and nonverbal IQ are good predictors of ELL's language development (see also Genesee and Hamayan, 1980). These results indicate that both a language aptitude (phonological memory) and nonverbal IQ contribute to language learning in ELL. In addition, Sparks, Gonschow, and Patton (2008) examined the components of language aptitude (phonological processing skills: phonemic awareness and phonetic coding) in relation to L2 learning. The results indicated that there is a significant relationship between measures of L1 phonological processing and high- and low-achieving and at-risk and not-at risk L2 learners. Individuals with strong L1 phonological processing skills and high L2 aptitude had higher scores on L2 proficiency measures than low-achieving L2 learners.

Factors related to first language. Each language has its own phonological system and grammatical morphology. Many investigators have examined the differences between an L1 and L2 in terms of phonological systems and grammatical morphology, and how these factors can affect the L2. The advantages and disadvantages of an L1 in the learning of an L2 in ELL are also commonly studied.

First language structure. The influence of linguistic knowledge from children's L1 on the learning of an L2 is known as transfer. Much of the linguistic knowledge that

children learn from their L1 (such as phonology, vocabulary, and grammar) aids L2 acquisition. The impact of an L1 on an L2 can be significant in ELL who are in the early stages of acquiring their L2 (Unsworth, 2005; Zdorenke & Paradis, 2008, 2009). In particular, benefits are conferred when both the L1 and L2 share patterns such as word order in sentences or rules for pronunciation. On the other hand, when the L1 and L2 differ, transfer errors in children's L2 learning may arise (Genesee et al. 2004). According to Genesee et al. (2004), the phonological system in an L1 is often considered to be a primary source of transfer errors in L2. In the Spanish language for example, when consonant clusters appear at the beginning of words (like /st/ or /sp/), they are often preceded by a vowel. As a result, ELL children with a Spanish L1 and an English L2 often pronounce the word *stop* /stap/ as "estop" /ɛstap/ , at least initially.

Morphosyntax is another area of transfer from an L1 to an L2 that is a common topic for research. For instance, Zdorenko and Paradis (2008; 2009) compared ELL whose L1 was either Spanish or Mandarin, and found that Spanish L1 children had an advantage in acquiring English articles (the, a) over Mandarin L1 children. Importantly, the Mandarin language does not have definite and indefinite articles (the, a) while Spanish does. Clearly the morphological knowledge of Spanish ELL supported grammatical knowledge acquisition in their L2. In addition, the study also found that overlap between L1 and L2 in terms of phonology can make language acquisition easier for ELL.

In addition, Zdorenko and Paradis (2009) examined the influence of the L1 on the structure of questions in English. Specifically, they examined the morphosyntax of questions in English that involve an auxiliary verb and a subject (e.g., *the dog is playing*

versus *is the dog playing*). The study examined two languages: Spanish, which uses auxiliary verbs in questions, and Chinese, which does not use auxiliary verbs in questions. The study compared the performance in the use of an auxiliary verb in questions by ELL with a Spanish L1 and children with a Chinese L1. The results indicated that children with an L1 that uses auxiliary verbs for questions are superior in using this auxiliary than those with an L1 that does not have this kind of morphosyntax.

The impact of an L1 on an L2 in terms of pronunciation has also been of interest to researchers. Goldstein (2004) and Fabiano-Smith and Goldstein (2010) reported that phonetic segments (sounds) that are shared between an L1 and an L2 can make acquiring the second language easier for ELL. ELL with a Spanish L1 pronounced phonetic segments (sounds) that are shared between English and Spanish better than those that are not shared. Nevertheless, Dulay and Burt (1973, 1974) found the opposite though, that the acquisition of English morphemes is independent of L1; ELL from different backgrounds such as Spanish and Chinese acquired English morphemes with the same level of accuracy.

Prior literacy and language experiences. A growing body of research shows the positive impact of early language skills (especially that of literacy) on children's academic achievement at school. Children's early experiences with literacy at home and in their community before schooling can also have a significant affect on academic language and literacy skills (Neuman & Dickinson, 2003). Children acquire language more quickly if they have had prior experiences at home with reading and writing (e.g., Neuman et al., 2003) . Interestingly, with ELL, research shows that the primary skills that support learning to read and write can be transferable from L1 to L2 learning (August &

Shanahan, 2006; Erdos, Genesee, Savage, & Haigh, in press; Genesee, Lindholm-Leary, Saunders, & Christisan, 2005). For example, abilities such as reading comprehension require specialized knowledge of names, sounds, alphabet, and certain skills for phonological awareness (e.g., August and Shanahan, 2006). Monolingual children who acquire these skills at home before school entry learn to read and write more quickly. Similarly, ELL who acquire these skills at home in their L1 can transfer these primary skills to their L2 reading and writing (Genesee et al. 2004). Many researchers show that there is a positive relationship between children's scores on tests of phonological awareness and alphabetical knowledge in their L1 before school entry and their later reading comprehension and word decoding skills (August & Shanahan, 2006; Erdos, et al., in press; Genesee, et al., 2005).

Factors related to a child's exposure to English. Many factors have a significant impact on L2 learning that relate to children's exposure to English, including a child's age when exposed to English, the ethnolinguistic community, and previous experience in L2 learning.

Child's age when exposed to English. Children who learn their second language from infancy simultaneously with their first language are commonly referred to as *simultaneous bilingual children*, whereas children who begin to learn their second language after they have established their first language are called *second language learners,* or *English language learners* (Genesee et al. 2004). As early as three years old, children already have well-established vocabulary and grammar in their L1; as a result, the effects of the L1 can be observed in the child's second language. That is, any language that children learn as a second language after establishing their first can be

influenced by the child's L1 (Genesee et al. 2004). Simultaneous bilingual children who learn two languages from an early age typically have more experience and fluency in their second language compared to ELL. Hyltenstam and Abrahamsson (2003) examined later and highly advanced second language learners. The study found that children who begin to learn English between the ages of 6 and 8 years or older are typically not comparable to English-native speakers in any aspect of their L2, even though in some cases the differences can be very subtle.

Nevertheless, Collier (1987) and Rossingh, Kover, and Watt (2005) found that ELL who begin to learn English later (such as in their middle school years) can have advantages over younger ELL for many reasons. Firstly, older children have better mental skills than younger ones; as a result, they can learn faster and develop a larger vocabulary than younger ELL. Secondly, older ELL who already have an established first language can transfer their language skills (especially literacy) from their first language to their second language. Golberg et al. (2008) compared ELL who began to learn English before they were five years old and children who began to learn it after they had turned five. Results indicated that after two years of exposure to the English language, ELL who learned English after turning five had larger vocabularies than ELL who learned English at an early age.

Jia and Fuse (2007) examined the impact of age on grammatical morpheme development in ELL. The study looked at ELL who arrived in the United States at ages ranging from 5 to 16 years old. The researchers found that older children/adolescents acquired their grammatical morphemes at a faster rate than younger ELL. However, for long-term learning, younger ELL achieved better results in grammatical morpheme

testing than older ELL. Thus, according to Jia and Fuse, older ELL outperform younger ones in short-term learning, whereas younger ELL outperform older ones in long-term learning. Realistically, the effects of age on academic achievement in ELL is still an ongoing debate, with a need for further research to clarify the differences of learning English at varying ages.

Child's previous experience with English. Practicing an English L2 at school, home, and in the community can facilitate L2 learning. Furthermore, the quality of that L2 exposure also has an important impact on L2 learning for ELL children. Jia and Aaronson (2003) and Jia and Fuse (2007) examined the impact of "richness" on the L2 environment outside the classroom and the L2 proficiency in ELL with a Mandarin L1. The study looked at many factors in children's environments that may support English language learning, such as the number of hours of English TV watched, the number of English books read, the number of English native-speaking friends, and the percentage of time English was spoken at home. The study indicated that the richness of the environment around a child is associated with faster acquisition of the English language. However, the frequency of English used by family members at home did not necessarily affect a child's L2 acquisition. According to Genesee et al. (2004), the quality of English language at home can play an important role in a child's L2 acquisition. For example, parents who are not proficient in English yet speak English at home frequently will not affect a child's English language outcome, especially after the child reaches a certain point in his or her English language learning. Paradis (2010) similarly found that the benefits of exposure to English at home in ELL depended on the parents' fluency in English. In summary, ELL children's proficiency in their L2 did not depend on their

parents' usage of English at home. However, ELL's proficiency in their first language does still depend on their parents' support at home (Duursma et al., 2007).

In addition, the quality of English language that is used inside the classroom by teachers is considered to be an important factor in L2 acquisition. Teachers are considered to be a primary source for ELL to learn English (e.g., Wong-Fillmore, 1983; Bowers & Vasilyeva, 2011). Bowers and Vasilyeva (2011) examined the association between the type of input provided by preschool teachers and children's lexical skill growth finding that ELL's vocabulary growth was strongly associated with the total number of words produced by their preschool teachers.

Moreover, the socioeconomic status (SES) of a child's family was found to be strongly associated with the quality of his or her L2. Oller and Eilers (2002) compared high-SES and low-SES ELL who had a Spanish L1 and an English L2. The study indicated that ELL with high-SES had better English performance than their low-SES peers. Golberg et al. (2008) compared English proficiency of ELL with or without a mother with postsecondary education. After two years of observation, it was found that the children of mothers with postsecondary education had larger vocabularies. However, one challenge in this study is that factors related to SES and mother education are difficult to separate from English proficiency.

Personality and social interaction. Many researchers investigated the relationship between children's social interactions and success at L2 learning. Wong-Fillmore (1983) followed 24 ELL for two years in California. The study reported that there is a positive relationship between children's "social style" (described as being talkative and outgoing) and success at learning an L2. ELL who have a high level of

social interaction with peers have more opportunity to speak and practice English. Naturally, having more interaction with English-native speakers can affect the learning of an L2 positively. Strong (1983) found that there is a significant correlation between personality variables and the amount of social interaction with English-native speakers. ELL in Kindergarten who interact significantly with their native-English peers can experience a positive impact on their English grammar, vocabulary, and pronunciation. However, according to Wong-Fillmore (1983), children who are less social, but have high academic skill levels can do well in their L2 learning. Not surprisingly, ELL who speak their L1 with peers during school activities do not reap the same benefits towards learning English as their ELL peers who use English to interact with others at school.

The Overlap Between Children with Specific Language Impairment (SLI) and English Language Learners (ELL)

The Overlap in Linguistic Characteristics Between Typically Developing ELL (TD ELL) and Monolingual Children with SLI

As mentioned in section 2, ELL who are in the early stage of developing their L2 (within the first two years in particular) tend to have foreign accents, errors in vocabulary choice, and errors in grammatical morphemes (Tabors, 2008). Paradis (2005) noted that the nonfluent and error-ridden language that appears in the speech of typically developing ELL (TD ELL) is considered to be part of the normal process of an incomplete L2 acquisition. Likewise, nonfluent and error-filled language appears to be a part of the linguistic characteristics of children with SLI (as mentioned in section 1). According to Paradis (2010), TD ELL and children with SLI have normal-range intellectual and social-emotional competence, however both groups have error-filled language. As a result, the developmental patterns of both groups (ELL and SLI) are similar, and largely parallel the developmental patterns of younger, English-speaking, monolingual children (Genesee et al. 2004).

Investigation about the overlap in the linguistic differences characterizing ELL and SLI groups is prevalent. Paradis, Rice, Crago, and Marguis, (2008), for example, found that typically developing ELL who are in the early stages of learning English as a second language have the same profile in English as children with SLI. Paradis (2005) compared the expressive language characteristics (both spontaneous and elicited speech) of monolingual children with SLI to that of TD ELL from multiple background languages

who had been learning English for an average of 9.5 months. Results showed that TD ELL had the same accuracy rate and error pattern with grammatical morphemes as their same-age monolingual SLI peers. Studies about other languages such as Hebrew, Dutch, and Swedish also illustrate the overlap in the morphosyntactic profiles of L2 children and children with SLI (e.g., Armon-Lotem, 2010; de Jong, 2010; Håkansson, 2001). It is clear that the linguistic features considered unique to each group are very few, which makes for considerable overlap between the two groups (Paradis 2005).

Distinguishing these groups (SLI and ELL) is important to our understanding of language development, our ability to identify children struggling with language, and in providing appropriate intervention. Using standardized measures of language ability to identify children with SLI is a common assessment method employed by researchers and clinicians. A consideration of how standardized test results may distinguish monolingual children with SLI and TD ELL is important to this thesis.

Standardized tests. As mentioned in section 1, children with SLI show a deficit in language ability compared to TD children. Records and Tomblin (1994) reported high agreement between clinician judgments of SLI and test results for children scoring at least 1.25 standard deviations below the mean on a the Test of Language Development – Primary 2 (TOLD-P:2; REF). It therefore seems that using standardized tests could be a good way to identify children with SLI and distinguish between monolingual children with and without language impairment (e.g., Leonard, 1998).

There are many studies that examine ELL's performance on English standardized tests (in many different areas of language), and these scores are often compared to the native-speaker range. For example, Hakuta, Goto Butler, and Witt (2000) examined

English standardized measures of oral proficiency of 1,872 ELL from various different minority L1 backgrounds. Results indicated that ELL could take around five years of schooling to achieve the same score as these scores of native-speakers. Furthermore, in terms of vocabulary, Cobo-Lewis, Pearson, Eilers, and Umbel (2002a) and Eilers, Pearson, and Cobo-Lewis (2006) found that school-age ELL (Spanish-English) earned scores below those of monolingual age-peers on standardized tests of productive and receptive vocabulary. The study, however, also found that the gap between these two groups narrowed by the fifth grade. Paradis (2005, 2008) examined the performance of ELL on a standardized test of morphosyntax development. The results indicated that after one year of exposure to English, 1 in 24 typically developing ELL had comparable scores to their same-age monolingual peers. In addition, after three years of exposure to English, this number increased to approximately half of the ELL.

According to Paradis (2005), the gap between ELL and native-speaker scores on standardized tests could be related to the aspect of language being examined by it. Her results indicated that after 21 months of exposure to English, 40% of ELL had the same score as the monolingual group for grammatical morpheme production, 65% for receptive vocabulary, and 90% for story grammar in a narrative. Paradis' explanation for ELL's success at story grammar is that the conceptual underpinnings of storytelling ability could easily transfer from children's L1to their L2. Similarly, Oller et al. (2007) found that bilingual (Spanish-English) children approached monolingual norms on the task of basic phonics skills; however, they had scores that were below the normal range on tests of receptive and productive vocabulary.

To summarize, both ELL and SLI groups have been found to perform poorly on standardized language measures. Further, these groups tend to show similar error patterns. As a result, English standardized tests may not accurately distinguish typically developing ELL and monolingual children with SLI. The findings reviewed above also raise questions regarding the suitability of using English standardized tests with ELL, especially in the first few years of L2 acquisition, an issue that will be discussed in the next section.

The risks of using a standardized test with ELLs. ELL may score below expectations on standardized language tests initially, but many are likely to catch up with their monolingual peers eventually (Paradis, 2005). Thus, using English standardized tests to assess ELL (at least in the early stages of L2 learning) may increase the risk of overidentification of learning disabilities or "mistaken identity" (e.g., Gutierrez-Clellen, 1996; Cummins, 2000; Donovan & Cross, 2002; Kinger & Artiles, 2003). Genesess and Lindholm-Leary (in press) reported that the incomplete acquisition of bilingual children's L2 could be misinterpreted as a learning problem. Indeed, ELL are often overrepresented in special education classes. It is clear that using a standardized test designed for monolingual or monoculture populations with multilanguage children is not a preferred method for assessing ELL (e.g., Peters-Johnson & Taylor, 1986). One reason that this is true is because most language-dependent measures such as English language standardized tests (norm-referenced assessment) are affected by children's prior knowledge and experience (Campbell, Dollaghan, & Needleman, 1997). Research has shown that any assessment tools that tap a child's knowledge (particularly vocabulary knowledge) may increase the risk of mistaken identity (Long, 1994; Nelson, 1993; Terrell & Terrell, 1983;

Vaughn-Cooke, 1986). As a result, a child's poor performance on standardized tests may reflect the child's lack of experience with the tests' stimuli rather than reflect the child's actual language ability (Long, 1994; Nelson, 1993; Terrell & Terrell, 1983; Vaughn-Cooke, 1986).

Assessment challenges. The problem of standardized tests for ELL has been addressed in two ways, by translating English versions to the child's L1, and by using a test standardized in the child's L1. Anderson (1996), Eng and O'Connor (2000), and Resterepo and Silverman (2001) reported that using translated versions of a standardized test with ELL could also result in erroneous assessment for several reasons. For example, translated versions of standardized tests may be adapted linguistically, but may not include accurate changes to represent culturally appropriate procedures or norms. Assessing ELL in their L1 could be reliable, and is even recommended as good practice (Eng & O'Conner, 2000; Gutiērrez-Clellen & Kreiter, 2003; Juárez, 1983; Restrepo, 1998). For example, Restrepo (1998) reported that the errors-per-turn-unit in spontaneous speech of ELLs (Spanish L1) was a good measure in distinguishing between ELL with SLI and TD ELL. Assessing ELL in their L1 may not always be possible however, as SLPs and testing materials may not be available for minority languages (Paradis, 2005). Furthermore, ELL children from minority ethnolinguistic communities often lose their L1 in the process of learning their L2; this process of L1 loss is referred to as *L1 attrition* (Genesee et al. 2004; Kohnert & Bates, 2002; Restrepo & Kruth, 2000; Wong-Fillmore, 1991). As a result, L1 attrition may lead to poor language performance on standardized tests in the child's L1 (Schiff-Myers, 1992).

Peña, Gillam, Bedore, and Bohman (2011) showed that to reduce the inappropriate diagnoses of language impairment in preschool and kindergarten bilingual children (Spanish L1-English L2) and to provide an overview of children's language ability, language screeners should assess ELL's performance in both of their languages (L1 and L2). Nevertheless, Thordardottir, Rothenberg, Rivard, and Naves (2006) compared typically developing monolingual children and typically developing (French-English) bilingual preschool-age children on expressive and receptive measures of vocabulary and syntax and found that bilingual children scored significantly lower than monolingual peers, regardless of whether they were measured in one language only or both languages.

Clinical Markers to Distinguish between TD ELL and Monolingual Children with SLI

As mentioned previously, English standardized tests may not accurately distinguish typically developing ELL and monolingual children with SLI (e.g., Paradis, 2005). Using English standardized tests to assess ELL may increase the risk of mistaken identity (e.g., Gutierrez-Clellen, 1996; Cummins, 2000; Donovan & Cross, 2002; Kinger & Artiles, 2003). Distinguishing between ELL and children with SLI is an ongoing concern (e.g., Campbell & Dollaghan, 1997). One potential solution for this problem is illustrated in the following section.

According to Bishop et al. (1996), clinical markers are phenotypic manifestations that characterize a specific type of disorder. Three markers have been proposed for distinguishing monolingual SLI and TD groups including nonword repetition (Bishop, North, & Donlan, 1996; Conti-Ramsden, Botting, & Faragher, 2001), sentence recall

(Conti-Ramsden et al., 2001), and finite verb morphology (Bedore & Leonard, 1998; Leonard, Miller, & Gerber, 1999; Rice, 2003; Rice & Wexler, 1996).

Recent research has applied some of these markers in the study of ELL in order to distinguish between TD ELL and monolingual children with language impairment (e.g., Torn & Gatherecole, 1999). In the following section, examples will be illustrated of the use of clinical markers (grammatical morphology, nonword repetition, and sentence recall) in identifying children with and without language impairment among monolingual and bilingual children.

Clinical markers across monolingual groups with and without language impairment. As was previously mentioned, three markers have been generally proposed to distinguish between monolingual SLI and TD groups: nonword repetition, sentence recall, and finite verb morphology. Some examples that use these clinical markers in identifying monolingual children with and without language impairment will now follow.

Grammatical morphology tasks. In a study of monolingual children, Bedore and Leonard (1998) found that grammatical morpheme production among monolingual preschool-age children could distinguish between monolingual children with SLI and TD children. The results of the study suggested that verb morpheme composite was considered to hold promise as a clinical marker for monolingual children with SLI. Similarly, Rice (2003) found that children with SLI were extremely delayed in the use of tense morphology, which suggests that tense morphology could be a clinical marker for English-speaking children with SLI.

Nonword repetition tasks. According to Gathercole (2006), nonword repetition is the ability to repeat a novel (nonsense) phonological form. Across a number of studies,

nonword repetition tasks show a very high level of diagnostic accuracy to identify English-speaking children with SLI (e.g., Dollaghan & Campbell, 1998; Ellis Weismer et al., 2000; Conti-Ramsden, Botting, & Faragher, 2001). Furthermore, Bishop, North, and Donlan (1996) used nonword repetition as a phenotypic marker to identify monolingual English-speaking children with SLI in school-age children.

Sentence recall tasks (SR). Sentences recall tasks (also sentence repetition, sentence imitation, and recalling sentences) require immediate repetition of auditory sentences (e.g., Archibald & Joanisse, 2009). For many years, sentence recall tasks have been included as a primary subtest of many language assessment batteries (e.g., the Clinical Evaluation of Language Fundamentals-4 (CELF-4; Semel, Wigg, & Secord, 2003); Test of Language Development-3 (Newcomer & Hamill, 1997).

Numerous studies have shown that monolingual children with SLI have poor performance in SR tasks compared to typically developing children (e.g., Briscoe, Bishop, & Norbury, 2001; Eadie, Fey, Douglas, & Parsons, 2002; Laws & Bishop, 2003; Norbury, Bishop, & Briscoe, 1001; Redmond, 2003). Conti-Ramsden et al. (2001) found that SR has the potential to act as the best clinical marker of children with SLI in English language compared to other measures such as nonword repetition, third-person singular, and past tense. In addition, Botting and Conti-Ramsdon (2003) also found that SR was superior to NWR and a past tense task in distinguishing between children with SLI, other groups of children with impaired language (autism spectrum disorder and two groups of children with primary pragmatic language impairment), and typically developing age-matched peers. SR was also found to be a useful clinical marker in many other languages such as Cantonese (Stokes, Wong, Fletcher, & Leonard, 2006), Italian (Vicari, Caselli,

Gagliardi, Tonucci, & Volterra, 2002; Volterra, Caselli, Capirci, Tonucci, & Vicari, 2003), and Dutch (Rispens, 2004).

Clinical markers across bilingual groups with and without language impairment. In order to distinguish between TD ELL and monolingual children with language impairment, research has applied some of these markers to the study of ELL (e.g., Torn & Gatherecole, 1999). In the following section, examples will be illustrated of the use of both grammatical morphology and nonword repetition in identifying bilingual and monolingual children with and without language impairment. Readers should note that the use of sentence recall as a clinical marker in studies of bilingual children has not yet been prevalent.

Grammatical morphology tasks. Paradis (2005) found that in both spontaneous and elicited speech, TD ELL and same-age monolingual children with SLI had the same accuracy rates and error patterns with grammatical morphemes on the Test of Early Grammatical Impairment (TEGI; Rice and Wexler, 2001). Results indicated that in the use of grammatical morphemes, TD ELL could be mistaken as language impaired. In addition, ELL performance in this task was not affected significantly by their age or amount of exposure to English. In conclusion, results show that grammatical morphemes cannot distinguish between TD ELL and monolingual children with SLI.

Nonword repetition tasks. Kohner, Windsor, and Yim (2006) compared the performance of three groups of children on a NWR task; monolingual English-speakers with specific or primary language impairment, TD monolingual English-speakers, and TD bilingual speakers (Spanish-English). The study found that TD bilingual children's performance on NWR was lower than TD English-speaking children. In addition, the

results suggest that NWR did not provide compelling diagnostic power for distinguishing TD bilingual speakers from monolingual children with language impairment.

Evidence from bilingual studies also supports that ELL performance on NWR tasks can be affected by children's previous language experience (Thorn & Gathercole, 1999). Thorn and Gathercole (1999) compared NWR performance for ELL and their monolingual peers and found that English-speaking monolingual children performed significantly better than TD ELL. It was suggested that poor performance by TD ELL might reflect a lack of experience with English language.

Recent work by Windsor, Kohnert, Lobitz, and Pham (2010) compared the performance of four groups of children: monolingual speakers with and without language impairment, and bilingual speakers (Spanish-English) with and without language impairment. Group performance was compared on both English and Spanish NWR tasks. For English NWR, TD bilingual children performed similarly to monolingual children with language impairment. For Spanish NWR, TD English monolingual children performed similar to bilingual children with language impairment. Results indicated that NWR performance was influenced by children's experience with the target language.

Other studies also support this finding; Gutiérrez-Clellen and Simon-Cereijido (2010) compared the performance of 4 to 7-year-old bilingual (Spanish-English) children with and without SLI, on both Spanish and English NWR tasks. Results indicated that NWR in English or Spanish alone had only moderate specificity and low sensitivity to detect SLI. However, if the results of both languages on NWR were considered together, the specificity was high. The findings indicate that the children's performance on NWR tasks was affected by language exposure and usage. Therefore, NWR in a single language

is not a valid measure to act as a clinical marker in multilanguage populations (Windsor, et al., 2010; Gutiérrez-Clellen et al., 2010).

Sentence recall tasks (SR). To the best of our knowledge, there are no studies that examine the utility of SR as a measure to discern between monolingual children with SLI and TD ELL. The question addressed in the present thesis is whether the SR measure could be a valid measure to distinguish between TD ELL and monolingual children with language impairment.

In the present study, school age monolingual children and ELL completed a measure of sentence recall (SR). As well, parents declared whether they were (or had ever been) concerned about their child's language development. From this, four groups were identified: monolingual children without parental concern regarding language development, monolingual children with parental concern regarding language development, ELL with parental concern regarding language development, and ELL without parental concern regarding language development. This thesis investigated the utility of SR in discriminating between these four groups.

In the current study, parental reporting about children's language development as a proxy was employed for identifying children with and without language impairment. I decided to use parental questionnaires as a method to identify children with and without language impairment for several reasons. Firstly, there is no "gold standard" in identifying language impairment in bilingual groups (e.g., Peña & Fiestas, 2009). Secondly, using parental concerns could be a good way to identify language impairment among a large heterogeneous sample of children, such as the one involved in the current study. Finally, according to many investigators, parent concern has shown a high

sensitivity for identifying SLI (Klee, 2008). Parent report has become increasingly utilized in identifying early language impairment in children (e.g., Paul, 1991; Rescorla & Schwartz, 1990; Thal & Bates, 1988; Ellis Weismer & Evans, 2002; Bishop, Price, Dale, & Plomin, 2003; Dale, Price, Bishop & Plomin, 2003; Rice et al., 2008). Similarly, Paradis, Emmerzael, & Duncan (2010) found that parent reports could provide a significant and moderate discriminant between TD ELL and ELL with language impairment with a higher specificity than sensitivity. The results also indicated that using parental reporting on first language development in conjunction with other measures could be a useful practice for SLPs to identify ELL with language impairment. Interestingly, many investigators also used parental reporting to document ELL's current exposure on both L1 and L2 (e.g., Peña, Gillam, Bedore, & Bohman, 2011).

Sentence recall was employed in the present study given that it has been found to have high sensitivity and specificity for identifying monolingual groups with language impairment (Archibald & Joanisse, 2009). Such findings give rise to the hypothesis that sentence recall performance will reliably distinguish children with weak or strong language skills based on parent concern about language development.

Research has shown that sentence recall tasks tap both phonological short-term memory (Bishop et al., 1996; Blake, Austin, Cannon, Lisus, & Vaughan, 1994; Conti-Ramsden et al., 2001; Kamhi & Catts, 1986; Willis & Gathercole, 2001), and linguistic abilities (Botting & Conti-Ramsdon, 2003; Eadie, Fey, Douglas, & Persons, 2002; Kamhi & Catts, 1986; MacWhinney, Feldman, Sacco, & Valdes-Perez, 2000; Willis, & Gathercole, 2001), or both (e.g., Conti-Ramsden et al., 2001; Archibald & Joanisse, 2009). As such, a monolingual advantage would be expected leading to higher

performance for groups whose native language matches the test language (English, in the current case). It is difficult to predict whether sentence recall performance will distinguish the two groups of primary interest: the monolingual children with weaker language skills as reflected by parental concern regarding language, and the ELL group learning English at an expected rate as reflect by no parental concern regarding language. It may be that the pressures exerted by the monolingual advantage and the parental concern result in equivalent performance by these two groups of interest. On the other hand, the task may be sufficiently sensitive to reveal differences.

Research Questions

The primary purpose of this thesis is to examine the problems of distinguishing between monolingual children with parental concerns regarding language development and English language learning (ELL) groups, and the utility of sentence recall as a measure in discriminating them. The following specific hypotheses will be addressed:

- Is there a monolingual advantage over ELL groups on a sentence recall measure?
- Does parental concern reliably distinguish children who perform well or poorly on sentence recall? Specifically, do both monolingual children and ELL without parental concerns regarding language development achieve higher scores on sentence recall than children in groups with parental concern?
- Is the accuracy in sentence recall sufficient to separate monolingual children with parent concern from ELL peers without parent concern about language?

CHAPTER 2

Methods and Measures

Introduction

The following chapter describes the study design, participant recruitment processes, and the study procedures and measures. This chapter also outlines the methods of data analysis and interpretation.

The study design was selected based on previous research indicating that differentiating monolingual children with specific language impairment (SLI) and English language learners (ELL) is challenging (e.g., Genesee et al., 2004). A number of researchers have examined the utility of grammatical morphemes (e.g., Paradis, 2005) and nonword repetition (e.g., Thorn & Gathercole, 1999) to act as clinical markers in distinguishing between these groups of children. However, results showed that grammatical morphemes and nonword repetition did not reliably distinguish between monolingual with SLI and typically developing (TD) ELL groups (e.g., Paradis, 2005; Thorn & Gathercole, 1999). The extent to which sentence recall may be useful in distinguishing children with SLI from those learning English as a second language has not yet been examined. Despite tapping existing language knowledge, sentence recall may be sufficiently sensitive to reveal group differences.

The group design in the current study was inspired by a study by Windsor, Kohnert, Lobitz, and Pham (2010). In the Windsor et al. study, children participated in one of four groups: TD English monolingual; English monolingual children with language impairment (LI); TD bilingual children (Spanish-English); bilingual (Spanish-English) with LI. All four groups participated in both English and Spanish NWR tasks.

The goal of the study was to examine the utility of (English and Spanish) NWR to identify children with language impairment in languages other than English.

Participants

Participants in the present study were drawn from a large database developed as part of a study investigating language, memory, and academic achievement in children (Language, Reading, and Mathematical Skills in Children, UWO Ethics, 16215S) conducted by Archibald and colleagues (Archibald, Oram Cardy, Joanisse, & Ansari, 2009). The previous study took an epidemiological approach by inviting all senior kindergarten to grade 4 children from 34 elementary schools in London, Ontario and surrounding area to participate. The present study focused on children between the ages of 6;0 and 9;11 from this database. A total of 1253 (649 males/604 females) school-age children participated with a mean age of 7 years (All: *M* = 7;3, *SD* = 1.10, range = 6;0-9;11; females: *M*=7;2, *SD* = 1.10, range = 6;0-9;11; males: *M* = 7;3, *SD* = 1.10, range = 6;0-9;11).

Participant groups. Participant groups were formed based on a questionnaire completed by the parents of each child in the study (Appendix A). Two questions on the questionnaire were relevant to this grouping: In one question, parents declared whether they were (or had ever been) concerned about their child's language development by circling 'YES' or 'NO'. Given the lack of a "gold standard" in identifying language impairment in bilingual groups, the parents' response to this question was used to identify groups with concern about language development. Parents also indicated whether English was the first language learned by their child by circling 'YES' or 'NO'. If no, parents were asked to list any other languages spoken in the home. Response to this question was

used to decide whether the child was a native-English monolingual speaker or an English Language Learner (ELL). Based on responses to these two questions, four groups were identified: (1) monolingual, no parental concerns about language development; (2) monolingual, with concerns; (3) ELL, no concerns; (4) ELL, with concerns.

Monolingual with and without parental concerns. There were 1103 monolingual children who spoke English as their native and only language in the present sample. Of these, 902 (459 males/443 females) parents reported that they were not nor had ever been concerned about their child's language development; these children were included in the group of monolingual children without parental concerns about language development (monolingual no-concern). For the remaining 201 (72 males/129 females) native English-speaking children, parents reported that they were concerned or had been concerned about their child's language development; these children were included in the group of monolingual children with parental concern about language (monolingual concern). The mean ages of the groups were as follows: monolingual without concern, 7;2 (*SD*=1.24), monolingual with parental concern, 7;1 (*SD*=1.31).

ELL with and without parental concerns. The 150 ELL in the present study had various minority languages as their L1 and English as their language of instruction. The parents of 92 of these children (51 males/41 females) reported that they were not nor had ever been concerned about their child's language development; these children were included in the group of ELL without parental concerns about language development (ELL no-concern). For the remaining 58 (22 males/36 females) ELL children's parents reported that they were or had been concerned about their child's language development; these children were included in the group of ELL children with parental concerns about

their language development (ELL concern). The mean ages of the groups were as follows: ELL without concern, 7;5 (*SD*=1.27), ELL with parental concern, 7; 1 (*SD*=1.26).

Procedure

Each child was tested individually in a quiet room in his or her school. In a single 10-minute session, each child completed the *sentence recall* task and other tasks not reported here. Parents completed the parent questionnaire at the time that they provided consent for the child to participate.

Sentence recall task. Sentences were taken from Redmond (2003). Participants were asked to immediately repeat 16 sentences, each composed of ten words (ten to 14 syllables). The number of active and passive sentences was equal across the task's stimuli. An example sentence was: "His little brother cleaned the dirty dishes and cups." This task has been found to have high sensitivity and specificity for language impairment (Archibald & Joanisse, 2009).

Sentences were presented via a digital audio recording of an adult female in fixed order. Sentences were scored online by a research assistant. Responses were scored in relation to the number of errors made in each sentence: a score of 2 meant the participant repeated the sentence correctly, a score of 1 was given if the participant made one to three errors, and a score of 0 for four or more errors, or no response. Participants could achieve a maximum score of 32.

Parent questionnaire. In addition to the questions described above relating to language concern and home language, the parent questionnaire also included questions related to maternal level of education. Maternal level of education is considered to be a

good proxy for socioeconomic status (Oller and Eilers, 2002; Golberg et al., 2008). Parents were asked to check the highest level of education attained by this child's mother. The descriptors included some high school, completed high school, some college, completed college, some university, and completed university. Responses were transposed to a 3-point scale with 1 corresponding to some/completed high school, 2 to some/completed college, and 3 to some/completed university. This question was optional, and was completed by 1200 of the parents in the study (monolingual no-concern: 872; monolingual concern: 196; ELL no-concern: 83; ELL concern: 50).

Statistical Analysis

Group performance on the sentence recall measure was compared using an Analysis of Variance (ANOVA) with Bonferroni-adjusted *post hoc* pairwise comparisons where appropriate. Simple effects were investigated within significant interactions using *t*-tests. Initially, however, I planned to investigate the effects of related factors expected to (or possibly expected to) influence sentence recall performance. These factors included development as reflected by age in years (6, 7, 8, 9), sex (male, female) and mother's level of education (3-point scale). If these factors were found to exert significant effects in a preliminary ANOVA, the significant factors would be retained in subsequent analyses.

CHAPTER 3

Results

Languages Represented in the Sample

In order to fully describe the sample, the different languages represented were examined first. Although small numbers preclude any statistical analyses based on specific language groupings, a description of the languages represented is of interest generally. A total of 38 languages were reported as the home language for the ELL sample in the present study. The languages were grouped based on factors such as country of origin and similarities (www.ethnologue.com), as well as considerations regarding group size. Appendix C lists all of the languages represented, and their groupings. Table 1 provides descriptive statistics for the mean (*SD*) sentence recall scores for children with or without reported concerns across language groupings. For example, children who spoke different dialects of one language were put in the same group (e.g., Syrian Arabic and Egyptian Arabic). Likewise, all different languages spoken in one country were grouped together; Farsi, Persian, and Kurdish are all spoken in Iran, for example. The number of children speaking each language varied widely. In some cases, 19 children spoke a given language (such as Arabic). On the other hand, many languages were only spoken by one child, such as Finnish, Swedish, and Romanian. The language groupings were also created to provide fairly equal numbers of children in each group.

Descriptive statistics for the sentence recall scores by the various participant language groups (with and without parental concern about language development) are presented in Table 1 and Figure 1. Although no statistical tests were completed to compare results across specific languages due to the small sample size, a clear pattern

emerged across the large majority of language groupings. In all groups, mean recall scores were higher for the no-concern group than the concern group, except for one (European Minorities, $n = 20$; with concern: $n = 4$; without concern: $n = 16$).

Table 1.

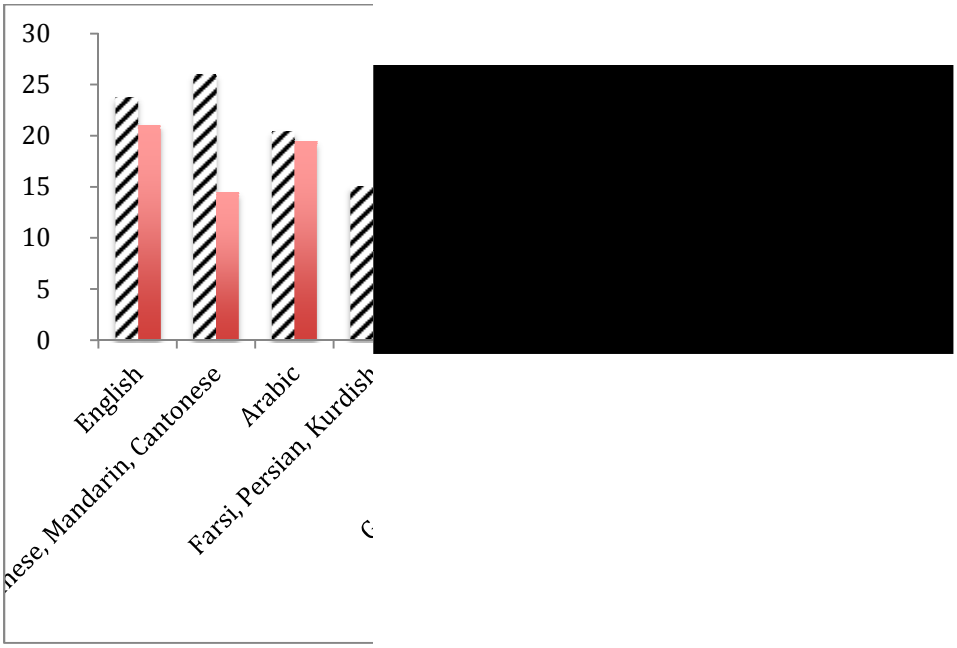
Mean (*SD*) sentence recall scores for children with or without reported concerns across language groupings

Language	Parental Concern			No Parental Concern		
	Mean	*SD*	*n*	Mean	*SD*	*n*
English	21.04	7.85	201	23.72	7.20	902
Chinese, Mandarin, Cantonese	14.40	10.75	10	26	4.69	6
Arabic	19.43	10.75	7	20.36	6.87	11
Farsi, Persian, Kurdish	5.25	5.56	4	15	12.83	6
German	21	7.83	4	22.63	5.12	8
Gujarati, and others[a]	20.67	5.20	6	20.89	9.11	9
Serbian, Albanian, Croatian, Bosnian	16	5.65	2	22.88	5.46	8
Spanish	8.33	4.50	3	18.57	6.29	7
Korean	14	6.58	11	18	15.68	5
European Minority Languages	26.50	8.34	4	21.63	7.66	16
Asian and African Minority Languages	11.60	10.11	5	20.17	8.37	12

a – Group includes Gujarati, Bengali, Punjabi, Telugu, Hindi, Malayalam, Gojri

Figure 1. Mean (*SD*) sentences recall score by children with or without repo

across language groupings:



* Group includes Gujarati, Bengali, Punjabi, Telugu, Hindi, Malayalam, G

Preliminary Analyses of Related Factors

Descriptive statistics for the sentence recall scores according to the fa

(6, 7, 8, and 9 year olds), sex (male, female), and mothers' level of educatior

school, college, and university) are presented in Table 2. An initial ANOVA

whether age (6, 7, 8, and 9 year olds), sex (male, female), and mothers' level

(high school, college, and university) exerted significant effects on sentence

performance. Results revealed significant main effects of age, $F(3,1176) = 9$

$\eta^2_p = .198$, and maternal level of education, $F(2,1176) = 18.12$, $p < 0.05$, $\eta^2_p = .0$

sex, $F(1,1176) = .06$, $p > 0.05$. Groups were collapsed across sex in all remain

whereas age was retained as a factor. Although mother's level of education a

significant effect, this factor was not included in the main analysis examining language status and parent concern (ANOVA) due to missing data (i.e., 53 parents did not answer this question). Instead, a corresponding ANCOVA was completed with maternal education as a covariate in order to ensure that patterns were not altered by this factor (see below).

Table 2

Descriptive statistics for the sentence recall scores according to the factors of age (6, 7, 8, and 9 year olds), sex (male, female), and mothers' level of education (high school, college, and university)

	Maternal Level of Education																	
	High school						College						University					
Sex of child ➔	Male			Female			Male			Female			Male			Female		
Age↓	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*	*n*
All	21.77	7.29	127	20.05	8.82	98	22.85	7.27	213	22.64	7.57	226	23.94	7.03	278	23.23	7.80	258
6yr. old	16.81	9.02	27	12.97	8.24	33	18.39	7.29	56	17.07	8.85	74	20.93	7.28	100	18.84	8.23	99
7yr. old	21.14	6.36	36	23.23	6.09	22	22.36	6.59	56	23.85	5.21	53	23.61	7.41	74	23.57	6.86	67
8yr. old	23.34	5.98	38	22.64	7.04	22	25.12	6.97	57	24.77	4.84	60	26.55	5.18	51	26.91	5.25	55
9yr. old	25.50	5.31	26	25.14	7.00	21	26.18	5.44	44	28.28	3.54	39	27.55	4.65	53	28.92	3.82	37

Group comparisons

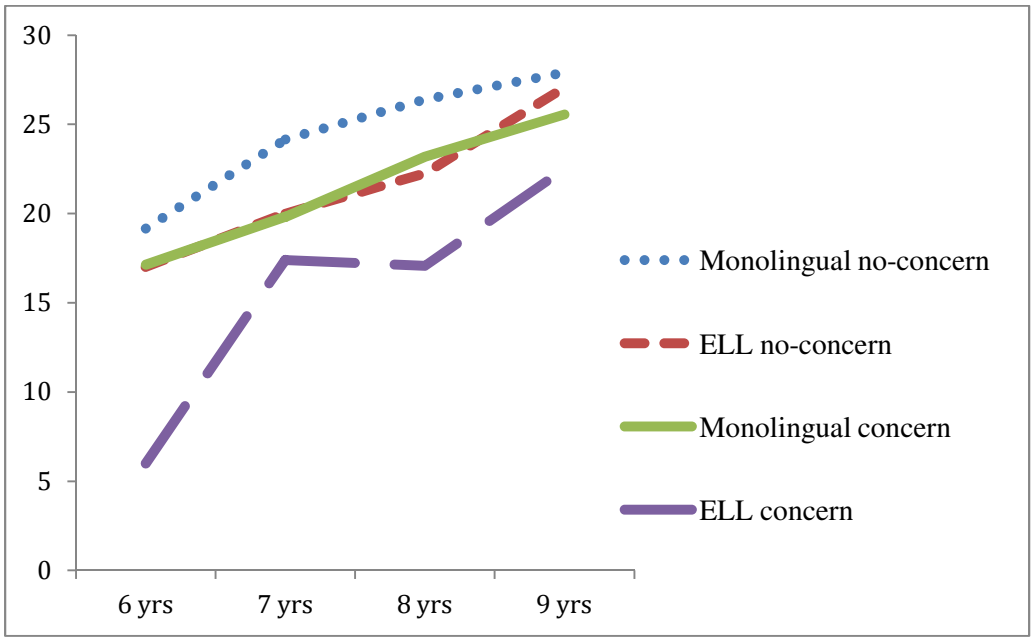
Table 3 and Figure 2 provide descriptive statistics for the sentence recall raw scores for the four groups of interest: monolingual with no parent concern about language development, monolingual with concern, English Language Learners (ELL) without concern, and ELL with concern. The groups without parental concern regarding language development had higher scores, as did the monolingual groups. As well, scores increased across developmental bands for both monolingual and ELL groups.

Table 3.

Descriptive statistics for sentence recall scores across age groups showing a developmental increase in mean (SD) scores for both monolingual and ELL groups with and without parental concern regarding language development

	Participant Group												
Age	Monolingual-Concerns			Monolingual-No Concerns			ELL-Concerns			ELL-No Concerns			
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	All
All	21.00	7.84	201	23.71	7.11	902	16.36	9.45	58	20.65	8.27	92	22.71
6yr. old	17.14	8.73	57	19.16	7.92	297	6.00	5.73	13	17.00	8.54	35	18.26
7yr. old	19.82	7.15	51	24.15	6.06	236	17.40	7.66	15	20	6.29	18	22.92
8yr. old	23.18	6.79	60	26.40	4.76	201	17.08	8.66	12	22.26	8.72	23	25.05
9yr. old	25.55	5.23	33	27.90	4.43	168	22.50	7.51	18	27.06	3.73	16	27.10

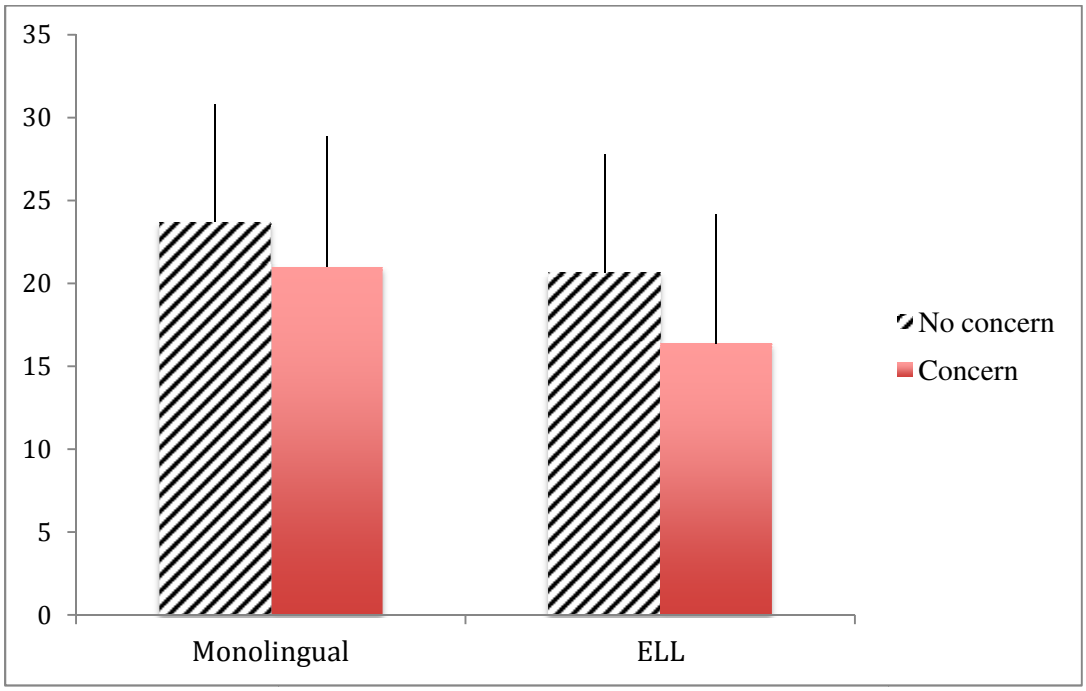
Figure 2. The overall Mean sentences recall scores for the four groups: (1) monolingual, no parental concerns; (2) monolingual, with concerns; (3) ELL, no concerns; (4) ELL, with concerns.



In order to compare the groups of interest, a mixed ANOVA with Bonferroni-adjusted *post hoc* pairwise comparisons was completed on the raw sentence recall scores as a function of home language (monolingual / ELL), parent concern (concern / no concern), and age (6, 7, 8, and 9 year olds). All main effects were significant: home language, $F(1,1237) = 46.47$, $p<0.05$, $\eta^2_p=.036$; parent concern, $F(1,1237) = 49.98$, $p<0.05$, $\eta^2_p=.039$; and age, $F(3,1237) = 55.84$, $p<0.05$, $\eta^2_p=.119$. Significant interactions were found between home language and concern, $F(1,1237) = 5.22$, $p<0.05$, $\eta^2_p=.004$, home language and age, $F(3,1237) = 2.81$, $p<0.05$, $\eta^2_p=.007$, and home language, concern, and age, $F(3,1237) = 3.44$, $p<0.05$, $\eta^2_p=.008$. The interaction between concern and age was not significant, $F(3,1237) = 1.44$, $p>0.05$.

The main effects of home language and parental concern are evident in Figure 3 displaying the average sentence recall scores for the monolingual and ELL groups with or without reported concerns about language. It is clear that the groups with no parental concerns achieved significantly higher scores than those with parental concerns (no concerns: $M = 22.99$, $SE = 0.37$; concerns: $M = 18.58$, $SE = .498$). A significant monolingual advantage as reflected by higher scores by the monolingual than ELL groups is also apparent (monolingual: $M = 22.91$, $SE = .263$; ELL: $M = 18.66$, $SE = .263$). The main effect of age revealed a significant increase with each increase in age band (see Table 3).

Figure 3. The overall mean (SD) sentences recall scores by monolingual and ELL children with or without reported concerns about language.



In order to unpack the significant interactions revealed in the ANOVA, simple effects using *t*-tests were investigated to compare individual pairwise groups where appropriate. Consider first the significant interaction between home language and concern presented in Figure 3. This interaction is of particular interest to the present thesis. Pairwise comparisons revealed that the scores of the monolingual no concern group was significantly higher than all remaining groups ($p \leq .001$, all cases), and that the scores of the ELL concern group were significantly lower than all remaining groups ($p \leq .003$, all cases). There was no significant difference between the monolingual with concern and ELL without concern groups ($p > .05$). This pattern reflects significantly lower scores for children with parental concern who were also ELL, and conversely, significantly higher scores for children without parental concern who were monolingual English. Importantly, the monolingual concern and ELL no concern groups did not differ.

Table 4 and Figure 4 provide descriptive statistics for the sentence recall raw scores for the significant interaction between home language and age. The increase with age for the monolingual groups was examined first. A significant increase with each age band was found ($p \leq .016$, all cases) with a diminishing effect size with each increment (6 vs. 7 years: d = -12.381; 7 vs. 8 years: d = -5.765; 8 vs. 9 years: d = -3.835). In contrast, patterns for the ELL group showed a different result; there was no significant increase between adjacent year increments (i.e., between 6 and 7 years, 7 vs. 8 years, and 8 vs. 9; $p > .005$, all cases). Significant increases occurred with each increment of 2 years (i.e., 6 vs. 8 years, $p = .003$, d = -0.712; and 7 vs. 9, $p = .023$, d = -0.874). This pattern reflects significant but somewhat diminishing improvement in sentence recall for monolingual children across the ages in this study, and a slower improvement for the ELL group with

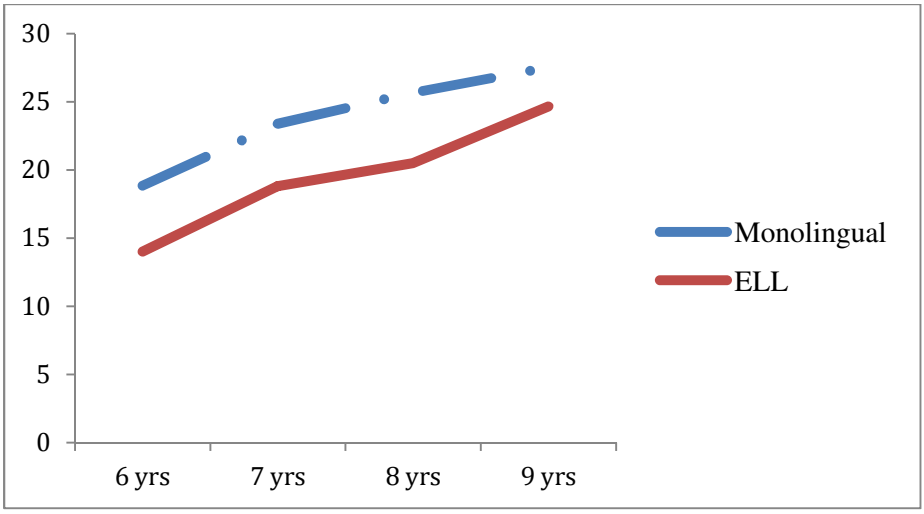
greater effects at 6 and 9. This interaction was further examined by comparing across monolingual and ELL groups at each year band. The monolingual group scored significantly higher than the ELL group for each age band ($p \leq .002$, all cases) with the greatest effect sizes happening at 7 and 8 years old (6 yrs: d = 0.556; 7 yrs: d = 0.679; 8 years: d = 0.719; 9 years: d = 0.520). Thus, the monolingual children showed a linear but diminishing improvement each year whereas the ELL children showed greater improvements at the youngest and oldest ages studied such that scores at 9 years approached that of the monolingual group.

Table 4.

Descriptive statistics for age groups reflecting a developmental increase in mean (*SD*) scores for both monolingual and ELL groups

Age	Participant Group					
	Monolingual			ELL		
	M	*SD*	*n*	*M*	*SD*	*n*
6yr. old	18.84	8.07	354	14.02	9.25	48
7yr. old	23.38	6.47	287	18.82	6.96	33
8yr. old	25.66	5.46	261	20.49	8.92	35
9yr. old	27.52	4.64	201	24.65	6.38	34

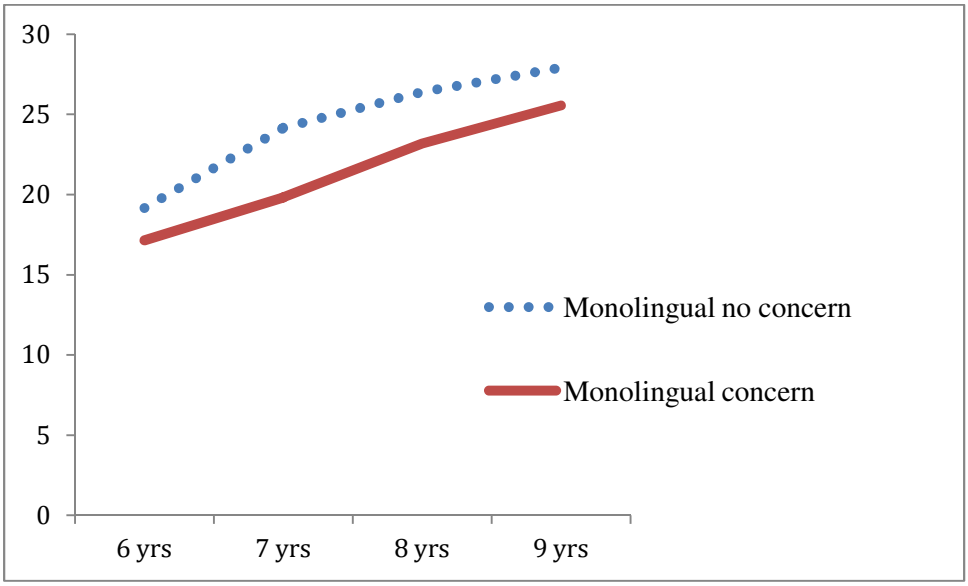
Figure 4. The overall Mean sentences recalled scores for the two groups: monolingual and ELL across all age bands.



Finally, consider the three-way interaction between home language, age, and concern. In order to unpack this three-way interaction, groups of interest were examined in pairwise comparisons. Consider first the monolingual groups with and without parental concern about language (see Figure 5). Investigation of simple effects revealed that the sentence recall scores of the monolingual no-concerns group increased with each age band increment from 6 through 8 years ($p < .002$, all cases). There was no difference between the scores of the monolingual no-concern 8 and 9 year olds (p > 05). In contrast, the monolingual with parental concern group showed a different pattern than their monolingual peers without parental concern. The 6-year-old monolingual concern group scored significantly lower than the 8 year olds ($p < .001$), as did the 7 compared to the 9 year olds ($p = .003$). All remaining age band comparisons for the monolingual concern group were not significant ($p > .05$, all cases). Comparing between groups, the monolingual no-concern group had higher scores than the monolingual concern group at 7 and 8 year olds ($p \leq .001$), but there was no significant difference at age 6 ($p > .05$).

The difference between the 9 year olds approached significance (p = .063). This pattern reflects significant improvement in development for monolingual children without concern that diminished for the oldest age group in the study (9 year olds). In contrast, the monolingual with parental concern groups showed a smaller increases in sentence recall scores than their monolingual peers without parental concern over the age groups studied.

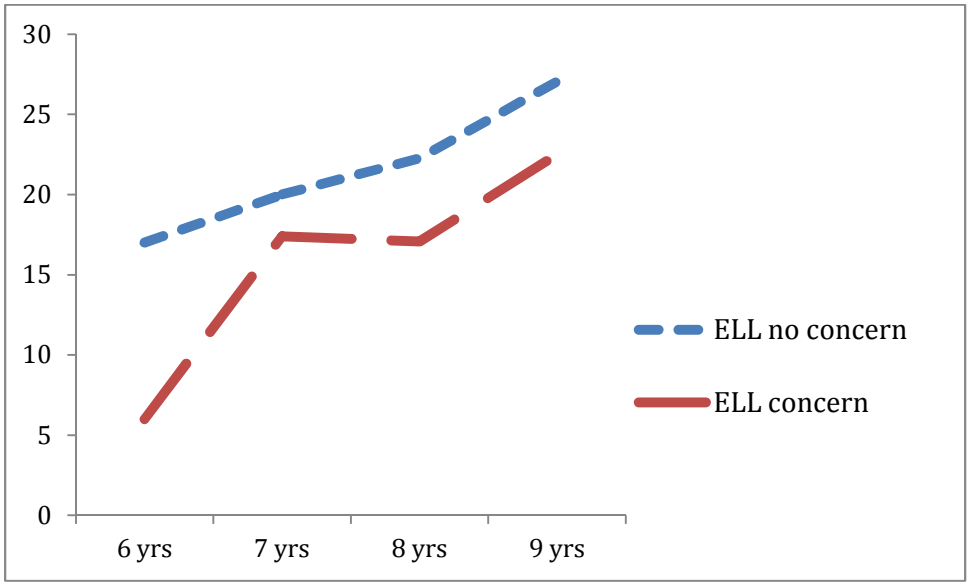
Figure 5. Mean sentence recall scores for the monolingual with and without concern groups



Next, the two ELL groups were compared (see Figure 6). Across the ELL no-concern groups, both the 6-year-olds (p < .001) and the 7 year olds (p =.048) had significantly lower scores than the 9-year-olds. All remaining pairwise comparisons between age bands for the ELL no-concern group were not significant (p > .05, all cases). For the ELL concern group, the 6-year-olds had significantly lower scores than all remaining groups (p < .001, all cases). All remaining pairwise comparisons were not

significant ($p > .05$, all cases). Comparing between groups, the ELL no-concerns group had significantly higher scores than the ELL concern group at 6 and 9 years old. Thus, the youngest ELL group (6 years old) had extremely low scores and showed nonsignificant increases in the remaining years while the ELL no-concern group had low scores to start with but did show a significant improvement in later year bands as well (i.e., 6 vs. 9 years, and 7 vs. 9; $p < .005$, both cases).

Figure 6. Mean sentence recall scores for the ELL with and without concern groups



Next, the monolingual and ELL groups without concern were compared; Table 5 and Figure 7 provide the descriptive statistics for the raw sentence recall scores across the monolingual and ELL without concern groups. Between group analyses revealed significant differences at 7 and 8 years ($p < .005$, both cases) but not 6 and 9 years ($p > .05$, both cases). Interestingly, the numerical values of the means for the two 9-year-old groups were within 0.84 of each other. Thus, the oldest and youngest children in the no

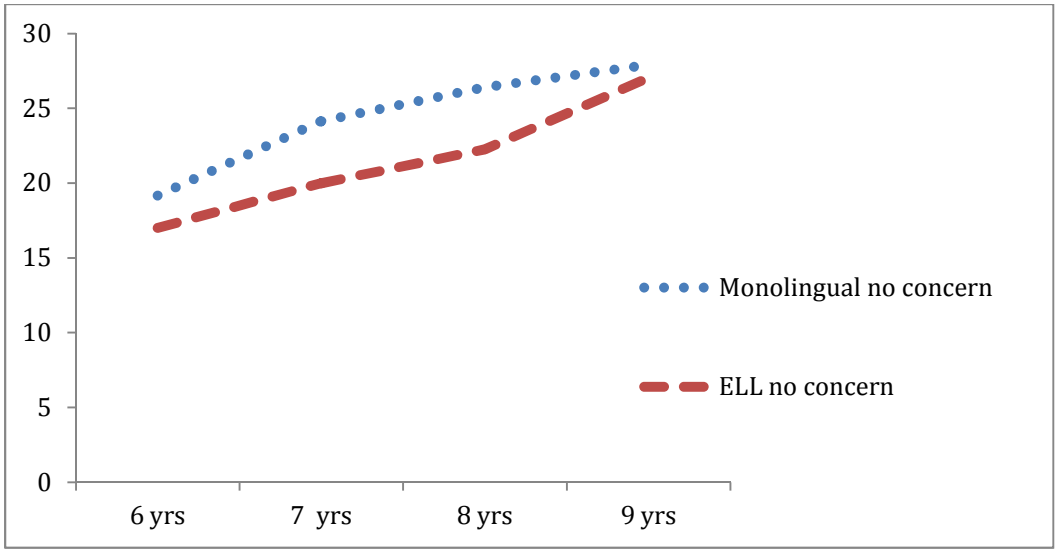
concerns group did not differ based on language status, although group differences based on language status occurred for the middle groups (7 and 8-year-olds).

Table 5.

Descriptive statistics for age groups reflecting a developmental increase in mean (SD) scores for both monolingual and ELL groups without parental concern regarding language development

Age	Participant Group					
	Monolingual-No Concerns			ELL-No Concerns		
	M	*SD*	*n*	*M*	*SD*	*n*
All	23.71	7.118	902	20.65	8.275	92
6yr. old	19.16	7.92	297	17.00	8.544	35
7yr. old	24.15	6.068	236	20	6.297	18
8yr. old	26.40	4.769	201	22.26	8.724	23
9yr. old	27.90	4.435	168	27.06	3.732	16

Figure 7. Mean sentence recall scores for the monolingual group without concern and the ELL group without concern



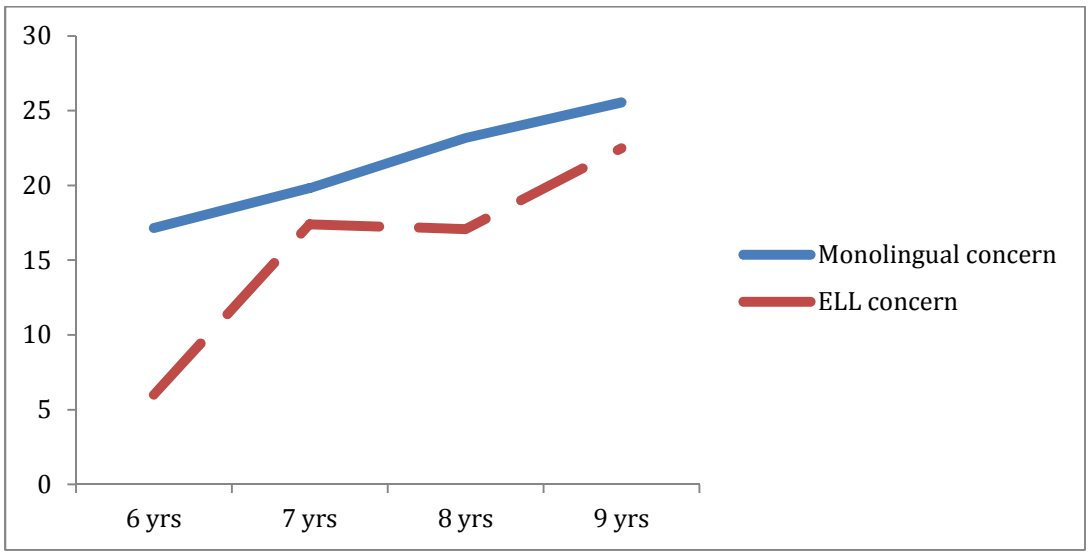
Next, the developmental pattern for the monolingual and ELL groups with concern were compared. Table 6 and Figure 8 provide the descriptive statistics for the raw sentence recall scores across monolingual and ELL groups with concern. Between group analyses indicated that there was a significant difference at ages 6 and 8 years ($p < 0.05$, both cases), but not 7 and 9 years ($p > 0.05$, both cases). As can be seen in Figure 6, the monolingual concern group showed a strong linear trend towards improvement whereas the ELL concern group had a non-linear increase across the age bands studied.

Table 6.

Descriptive statistics for age groups, developmental increase in mean (*SD*) scores for both monolingual and ELL groups with parental concern regard language development

Age	Participant Group					
	Monolingual-Concerns			ELL-Concerns		
	M	*SD*	*n*	*M*	*SD*	*n*
All	21.00	7.849	201	16.36	9.457	58
6yr. old	17.14	8.735	57	6.00	5.73	13
7yr. old	19.82	7.152	51	17.40	7.661	15
8yr. old	23.18	6.796	60	17.08	8.66	12
9yr. old	25.55	5.239	33	22.50	7.517	18

Figure 8. Mean sentence recall scores for monolingual and ELL groups with parental concern regarding language development



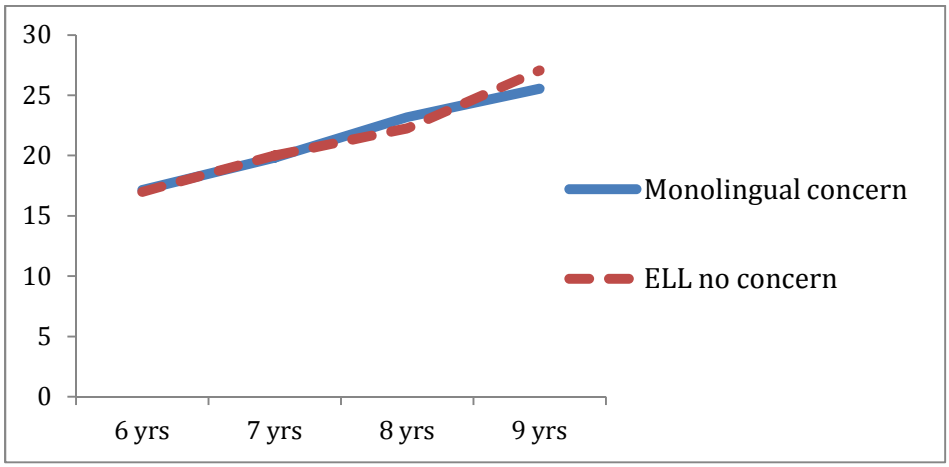
Finally, the development pattern for the monolingual concern group and the ELL no concern group was compared, which are the two groups of most interest in this thesis. Table 7 and Figure 9 provide descriptive statistics for the raw sentence recall scores across the monolingual concern group and the ELL no concern group. Between group analyses indicated that there were no significant differences between groups for each age band ($p > 0.05$, all cases). Numerically, the greatest difference in the two groups occurred at age 9. This comparison was also associated with the greatest effect size (6 years: d = 0.016; 7 years: d = -0.027; 8 years: d = 0.119; 9 years: d = 0.337).

Table 7.

Descriptive statistics for age groups, developmental increase in mean (*SD*) scores for both monolingual with parental concern regarding language development and ELL without parental concern regarding language development

Age	Participant Group					
	Monolingual-Concerns			ELL-No Concerns		
	M	*SD*	*n*	*M*	*SD*	*n*
All	21.00	7.84	201	20.65	8.27	92
6yr. old	17.14	8.73	57	17.00	8.54	35
7yr. old	19.82	7.15	51	20	6.29	18
8yr. old	23.18	6.79	60	22.26	8.72	23
9yr. old	25.55	5.23	33	27.06	3.73	16

Figure 9. Mean sentence recall scores for the monolingual group with concern and the ELL group without concern



To summarize the results for the group comparisons, monolingual Enlgish-speaking children, those without parental concern regarding language, and older children achieved higher sentence recall scores. Additionally, these three factors interacted such that monolingual speakers showed a more linear increase in sentence recall scores across age bands than ELL. The ELL group without parental concern regarding language development also tended to show a linear increase in sentence recall scores across age bands. As well, there were no significant difference based on language status for the groups without parental concern in the youngest and oldest (6 and 9 year) groups only. The group with both ELL and parental conern started with extremely low scores and showed a nonlinear increase across age bands. Finally, the groups of particular interest, the monolingual concern and ELL no concerns group did not differ at all age bands studied, although the effect size was greatest for the oldest group.

Group Comparisons with Maternal Education Included

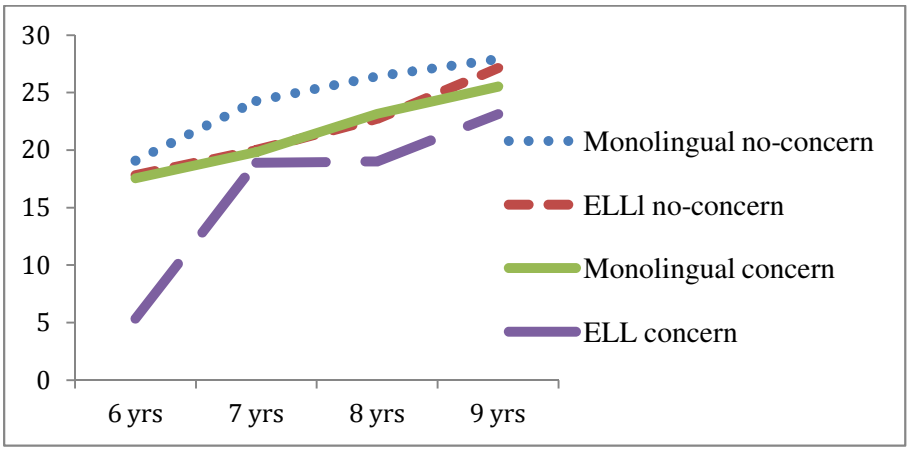
As mentioned previously, because the data for mothers' level of education was incomplete, it was not included in the main analysis as a factor. Nevertheless, I wanted to be sure that the patterns observed in the main analysis held even when differences in maternal education were taken into account. Table 8 and Figure 10 provide the descriptive statistics for the raw sentence recall scores for the four groups by age band after I included mothers' levels of education as a covariate. It is clear that the patterns in the data are very similar. A corresponding ANCOVA was completed on the sentence recall scores with home language (Monolingual / ELL), concern (Concern / No Concern), and age (6, 7, 8, and 9 year olds) as factors, and mothers' level of education as a covariate. As in the previous analysis, all main effects were significant: home language, $F(1,1183) = 35.18$, $p<0.05$, $\eta^2_p=.029$; parent concern, $F(1,1183) = 35.35$, $p<0.05$, $\eta^2_p=.029$; age was a significant, $F(3,1183) = 56.08$, $p<0.05$, $\eta^2_p=.125$. Significant interactions were found between home language and concern, $F(1,1183) = 3.31$, $p<0.05$, $\eta^2_p=.003$, home language and age, $F(3,1183) = 2.57$, $p<0.05$, $\eta^2_p=.006$, and home language, concern, and age, $F(3,1183) = 5.33$, $p<0.05$, $\eta^2_p=.013$. The interaction between concern and age was not significant, $F(3,1183) = 2.26$, $p>0.05$. Mothers' level of education was a significant covariate, $F(1,1183) = 37.58$, $p<0.05$, $\eta^2_p=.031$. It is clear from the results that after adding mothers' level of education as a covariate, the results were not changed. The same pattern of results was observed as in the previous analyses that did not include mothers' level of education as a covariate.

Table 8.

Descriptive statistics for age groups, developmental increase in mean (*SD*) scores for both monolingual and ELL groups with and without parental concern regard language development

Age	Participant Group											
	Monolingual-Concerns			Monolingual-No Concerns			ELL-Concerns			ELL- No Concerns		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
All	21.1	7.74	196	23.69	7.16	871	17.1	9.71	50	20.94	7.71	83
6yrold	17.55	8.54	55	19.08	7.91	290	5.33	5.43	12	17.84	8.16	32
7yrold	19.82	7.15	51	24.28	6.07	228	18.91	7.34	11	20	6.29	18
8yrold	23.16	6.84	58	26.41	4.82	195	19	7.91	10	22.7	7.49	20
9yrold	25.53	5.32	32	27.93	4.44	158	23.12	7.26	17	27.15	3.95	13

Figure 10. The overall Mean sentences recalled correctly by the four groups of children: (1) monolingual, no parental concerns; (2) monolingual, with concerns; (3) ELL, no concerns; (4) ELL, with concerns.



CHAPTER 4

Discussion

In this study, the performance of 6-to-9 year old monolingual children and children learning English as a second (or other) language (English language learners; ELL) with and without parental concern about language development were compared on sentence recall tasks. The aim of this thesis was to address the diagnostic challenge to distinguish between typically developing (TD) ELL and monolingual children with language impairment. Of particular interest was whether the English sentence recall task could distinguish between these two groups of children.

Across the large majority of languages represented in the current study, results revealed clear advantages for those whose parents were not concerned about the child's language development. More accurate recall was also observed for monolingual speakers, and older children. As well, these factors interacted in the way they influenced sentence recall performance. The monolingual no-concern group showed a linear increase in sentence recall scores across all but the oldest age group studied indicating continued improvement in sentence recall during the early school years with more stable performance after 8 years of age. Relative to the monolingual no-concern group, both the monolingual concern and ELL with no-concern groups had significantly lower scores for the 7 and 8 year olds only. At 6 years, groups tended to have greater variance in their performance resulting in no difference for these three groups. The monolingual concern group and ELL with no-concern groups showed score increases across nonadjacent age bands including the oldest group (9 years) leading to a reduction in the performance gap with the monolingual no-concern group at 9 years old. The ELL with concerns group had

significantly lower scores at 6 years than all remaining age bands and participant groups. Although the ELL with concerns group score increase was not significant across the 7-to-9 year age bands, significant performance gaps were observed relative to other participant groups for these age bands (with the monolingual concern group at 8 years, the ELL no-concern group at 9 years, and the monolingual no-concern group for all age bands). Maternal education also influenced sentence recall, however this factor did not alter the patterns described here. Importantly, no differences were observed between the monolingual concern and ELL no-concern group for any age band, although the greatest effect size was observed for the oldest group.

Typically developing children who spoke only one language and whose parents were not concerned about the child's language development showed a pattern of increasing accuracy in sentence recall in the early school years with more stable performance after 8 years in the present study. These results replicate many previous findings of a developmental trend in typically developing children in sentence recall (e.g., Briscoe, Bishop, & Norbury, 2001; Eadie, Fey, Douglas, & Parsons, 2002; Laws & Bishop, 2003; Norbury, Bishop, & Briscoe, 2001; Redmond, 2003), and other measures of phonological short-term memory (e.g., Bishop et al., 1996; Blake, Austin, Cannon, Lisus, & Vaughan, 1994; Conti-Ramsden et al., 2001; Kamhi & Catts, 1986; Willis & Gathercole, 2001). Summarizing a range of developmental findings, Gathercole (1999) suggested that short-term memory performance increases steeply up to 8 years of age, and shows more gradual improvement thereafter. It may be that the lack of a significant difference between the 8 and 9 year olds in sentence recall in the present study reflects this developmental trend for smaller increases after age 8.

Children whose first language was not English, but who were learning English as the language of instruction in school (ELL) and whose parents were not concerned about the child's language development showed a linear increase in sentence recall performance with significant differences between the oldest group (9 year olds) and both the 6- and 7-year olds. By 9 years, the sentence recall performance of this ELL group did not differ from their monolingual peers without parental concern about language development. These results suggest that it may take up to 4 years for sentence recall in ELL to approach that of their monolingual peers. The finding that it may take more than 4 years for the language abilities of ELL groups to match those of their monolingual peers is in agreement with previous finding (e.g., Hakuta, Goto Butler, & Witt, 2000). However, Hyltenstam and Abrahamsson (2003) found that children who begin to learn English between the ages of 6 and 8 years or older are typically not comparable to English-native speakers in any aspect of their L2, even though in some cases the differences can be very subtle.

Parental concern regarding language development was associated with a significant reduction in sentence recall scores for almost all languages represented in the present study. Monolingual English children with concerns regarding language development had significantly (or almost significantly) lower scores at all ages studied except the youngest age group (6 year olds). The 6-year-olds tended to be more variable overall, which may account for the lack of a significant difference in this age band. This variability in performance may be related to the well-known variability in language performance in young children (Fenson, Dale, Reznick, Bates, Thal, & Pethick, 1994; Goldfield & Snow, 2005; Shore, 1995). At 9 years (where there was a marginally

significant effect), the reduced group effect may have been related to the stabilizing performance of the no-concern group rather than an improvement in the concern group. The finding of reduced sentence recall in language-impaired relative to typically developing groups is consistent with many pervious findings (e.g., Briscoe, Bishop, & Norbury, 2001; Eadie, Fey, Douglas, & Parsons, 2002; Lows & Bishop, 2003; Norbury, Bishop, & Briscoe, 2001; Redmond, 2003). Nevertheless, the lack of (or reduced) group effects at 6 and 9 years of age is somewhat surprising. It may be that the typically developing sample in the present study included a broader range of performance than previous studies. Or perhaps, this reduced effect may be related to factors associated with the present study, such as the sample size or the parental report. For example, the imbalance in the group size may have affected the results; there were 902 children in the monolingual no-concern group, compared to 202 children in the monolingual concern group. Secondly, it may be parent concern was not sensitive enough at these age bands. Parents may be less concerned about a young child not talking well thinking the child will improve. As well, older children may talk well enough for day-to-day communication leading the parent to not be concerned about the child's language.

Children whose first language was not English and whose parents were concerned about the child's language development performed very poorly on a sentence recall task in the present study. There was a significant increase in scores in this group between the 6 and 7 year olds, but no further reliable differences across age bands. This pattern reflects an initial positive change in abilities, but no further reliable increases across the remaining age groups spanning 3 years. At both 6 and 9 years, the ELL with parental

concern group had significantly lower scores than their ELL peers without parental concern suggesting that the ELL with concern group arrives at school with lower sentence recall abilities and does not show the same improvement as their ELL peers without concerns. It may be that children in the ELL without parental concern group had more experience with English prior to arriving at school leading to their higher scores at 6 years of age. Nevertheless, the ELL with parental concern group also failed to show a pattern of consistent improvement across the age bands studied suggesting that at least some of these children are struggling to learn English as well. It is likely that some of these ELL also have a language impairment resulting in persistent linguistic differences (see Paradis, 2007).

Clinical Implications

The developmental pattern for the monolingual concern group and the ELL no concern group were compared, which are the two groups of most interest in this thesis. The results indicated that there were no significant differences between the two groups for each age band, although, the greatest effect size between the two groups occurred at age 9 (with the average score of the ELL group being numerically higher). As a result, the sentence recall measure did not reliably distinguish between the concern and no concern groups in this multilanguage sample. Given the increasing effect size observed for the group differences, it would be important to examine sentence recall differences beyond age 9. Typically developing ELL should improve their L2 over time while monolingual children with language impairment may continue to have linguistic deficits. As a result, linguistic tasks such as sentence recall may become more useful at distinguishing between typically developing ELL and monolingual children with

language impairment over time. The present results suggest that this may take more than four years of English schooling.

The study findings also suggest profiles that may distinguish ELL who are or are not struggling to learn English. ELL without parental concern regarding language development showed a steady increase in sentence recall scores over the ages studied with the oldest group (9 years) performing at a level that did not differ from their monolingual peers. ELL with parental concern, on the other hand, did not show the same increases after an initial change between the 6 to 7 year olds. This pattern suggests that after an initial growth upon school entry, a pattern of increasing sentence recall performance may distinguish ELL who are typically developing from those who are language impaired. However, it needs to be noted that there is considerable individual variation in the rate at which children acquire a second language. Notably, there are many important factors that can lead to individual differentiation among ELL (e.g., Paradis, 2007; Saunders & O'Brien, 2006).

Study Limitations

There are several limitations to the present study. Foremost, parental report measures were employed to identify monolingual speakers and ELL with and without language impairment. There is little doubt that using English standardized tests for monolingual children, and assessing ELL in their dominant language would provide a more valid and reliable means of identifying children with and without language impairment. However, there are no "gold standard" tests to assess ELL from multiple L1 backgrounds (e.g., Peña & Fiestas, 2009). Further complicating the issue is that there was a large heterogeneous sample of children in this study. Although the use of parental

report was justified, the report was gathered through a single question on a written questionnaire brought home by the child from school. It is possible that some parents had difficulty reading the questionnaire, or interpreted the question differently than was intended. Future research could provide translated questions administered by trained personnel to be sure that parents understand the intent of the question.

Another limitation of the study is the lack of the information about important factors that can affect L2 acquisition and ELL performance. For example, no information regarding the children's age when first exposed to English was collected. Studies show that children's age when exposed to English can affect performance in many aspects of language, for example, vocabulary size (Golberg et al., 2008) and grammatical morpheme development (Jia & Fuse, 2007).

Moreover, information about the ELL children's previous experiences and daily use of their L1 and L2 was also unavailable. Certainly, such information may affect ELL performance. According to parental reports however, all members of the ELL group spoke a different language at home than English, which suggests that most would have started to learn English when they started their schooling.

Conclusion

The present study examined whether an English sentence recall task could distinguish between school age ELL without parental concern about language development and monolingual children with parental concern about language development. The primary finding of this study was that the sentence recall performance of ELL without parental concern about language development and monolingual children with parental concern about language development overlapped throughout the 6-to-9 year

old age range studied. Furthermore, the advantage that monolingual children have over ELL with and without parental concern regarding language can be clearly seen from the study results. As a result, sentence recall is not sufficient to act as a clinical marker of language impairment among ELL. As a result, sentence recall is not a recommended measure for identifying language impairment in multulanguage samples in this age range. The results provide further evidence that the continued concern regarding potential erroneous diagnosis of ELL as having language impairment is warranted when English language tasks are employed.

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Appendix A

Parental Questionnaire

LANGUAGE, READING, AND MATHEMATICAL SKILLS IN CHILDREN
OPTIONAL ADDITIONAL INFORMATION

Dear parent(s),

Thank you for your interest in our study! In addition to the attached consent form, we would be grateful if you would please answer the following questions and return this form with the consent form to your child's school. Completion of this questionnaire is optional. You may choose not to complete these questions and your child may still participate in our study.

The information collected here will help us to better understand how home factors such as native language and parent education are related to the language, reading and mathematical skills we are studying.

(PLEASE PRINT CLEARLY WHEN COMPLETING THIS FORM)

Questionnaire

Please feel free to complete as many or as few of the questions as you wish.

Does your child wear eyeglasses? Yes No

Is your child left-handed or right-handed? Left Right

Is English the first language your child learned? Yes No

If no, what other languages are spoken in this child's home (please list):
_____

Have you ever been concerned about this child's language development? Yes No

Have you ever been concerned about this child's ability to learn to read? Yes No

Have you ever been concerned about this child's ability to do math? Yes No

Has this child been diagnosed by a doctor as having any of the following:

□ Hearing Impairment □ Attention Deficit Hyperactivity Disorder
□ Autism Spectrum Disorder □ Other _____

please continue on reverse

Appendix B

Ethics Approval

Office of Research Ethics

The University of Western Ontario
Room 4180 Support Services Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. L. Archibald
Review Number: **16215S** **Review Level:** Full Board
Review Date: June 05, 2009

Protocol Title: Language, Reading, and Mathematical Skills in Children
Department and Institution: Communication Sciences & Disorders, University of Western Ontario
Sponsor: NSERC-NATURAL SCIENCES ENGINEERING RSRCH COU
Ethics Approval Date: July 03, 2009 **Expiry Date:** September 30, 2012
Documents Reviewed and Approved: UWO Protocol, Assent Letter, Letter of Information and Consent (Parent), Letter of Information (Teachers).

Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above named research study on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the study or consent form may be initiated without prior written approval from the NMREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the NMREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the NMREB.

Chair of NMREB: Dr. Jerry Paquette

Ethics Officer to Contact for Further Information			
☐ Grace Kelly (grace.kelly@uwo.ca)	☐ Janice Sutherland (jsutherl@uwo.ca)	☐ Elizabeth Wambolt (ewambolt@uwo.ca)	☐ Denise Grafton (dgrafton@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File

Appendix C

Language groupings

Language grouping, and the numbers of children with or without reported concerns across each language group

Language	No Concerns (n)	Concerns (n)
English	904	202
Chinese-Mandarin-Cantonese	6	10
Arabic	11	7
Farsi-Persian-Kurdish	6	4
German	8	4
Gujarati-Bengali-Punjabi-Telugu-Hindi-Malayalam-Gojri	9	6
Serbian- Albanian- Croatian- Bosnian	8	2
Spanish	7	3
Korean	5	11
European Minority Languages (French-Greek-Finnish-Dutch-Swedish-Romanian)	16	4
Asian and African Minority Languages (Ukrainian-Indonesia- Pilipino-Vietnamese-Urdu- Somali-Tigrigna- Russian)	12	5

CURRUCULUM VITA

Name: Areej Mazin Balilah

Post-secondary Education and Degrees: Bachelor's Degree with First Honors, from the Childhood Studies filed, King Abdul Aziz University (2006)

Honours and Awards: Book Award, contest of The Ministry of Education, National Commission for Childhood. Saudi Arabia (2010).

Related Work Experience:

- **Teaching Assistant.** (Winter 2012-Present), With Dr. S. Trujillo, MBA, MSC, OT Reg.(Ont), Professor Emeritus at the School of Health Studies, Health Sciences 4044b, Section 2, University of Western Ontario, (International Health Systems Comparisons).
- **Research Assistant.** (Fall-Winter 2011), With Dr. L. Archibald in the Language and Working Memory, University of Western Ontario.
- **Member of the Teaching Council.** (2006-Present), Childhood Studies Section – Faculty of Home Economics-King Abdul Aziz University.

Other Scientific Research: I am working with Dr. Archibald on a project about Reading Efficiency in Monolingual and ELL Children with and without Parental Concerns about Reading Development. This project will be presented at the Symposium on Research in Child Language Disorders in Madison, Wisconsin (June 2012).

Participation in Conferences:

- Poster presentation at the CSD Research Poster Day – University of Western Ontario (February 2012)
- Poster presentation at the HRS Graduate Research Forum: *"Brewing*

Research Steeped in Ideas," University of Western Ontario (February 2012)

- Poster presentation at the Symposium on Research in Child Language Disorders, Madison, Wisconsin, USA (June 2011)
- Oral presentation at the Symposium on Research in Child Language Disorders, Madison, Wisconsin, USA (June 2012)

Publications:

- 12 children short stories about children rights, under the supervision of the Ministry of Culture and Media- Saudi Arabia, and in association with UNICEF (2009).
- Balilah, A. (2010). My Child and I, and the Computer. Saudi Arabia, The Ministry of Education, National Commission for Childhood, 978-9960-48-824-0.