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The Development of Lexical-Semantic Skills in Early Sequential Cantonese-English Bilingual Children

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THE DEVELOPMENT OF LEXICAL-SEMANTIC SKILLS IN EARLY SEQUENTIAL CANTONESE-ENGLISH BILINGUAL CHILDREN

by

KRISTINA KOENIG

B.A., Wesleyan University, 2004

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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The Development of Lexical-Semantic Skills in Early Sequential Cantonese-English Bilingual Children  
Thesis directed by Assistant Professor Pui Fong Kan

Abstract

The purpose of this study is to explore lexical-semantic development in early sequential bilingual children who speak Cantonese (L1) as a home language from birth and started to learn English (L2) as a second language in a preschool setting. Linguistically- and culturally- appropriate picture naming and picture identification tasks were developed to assess participants’ expressive and receptive vocabulary knowledge. In Study 1, seventy children participated in picture naming and picture identification tasks comparing their performance as a function of language (L1 or L2), modality (expressive or receptive), age, length of time at the preschool, and performance on standardized vocabulary assessment tools. In Study 2, the results on these tasks of five children on an Individualized Education Plan (IEP) were compared with typically developing, age-matched peers. Results from Study 1 indicate that there is a correlation between a child’s scores with their age, time in school and their scores on standardized tools in both tasks in English and picture identification tasks in Cantonese, but not with picture naming in Cantonese. Results from Study 2 show that only one of five children on IEPs had noticeably lower scores in tasks in both languages when compared to typically-developing peers. This underscores the importance of a culturally and linguistically appropriate assessment tool in distinguishing bilingual children who have a language difference from those with a language disorder.
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The Development of Lexical-Semantic Skills in Early Sequential Cantonese-English Bilingual Children

Introduction

The purpose of this study is to explore the lexical development of early sequential bilingual children who speak Cantonese as a home language (L1) and begin learning English, a second language (L2), in preschool. In particular, this study examines lexical development in L1 and L2, looking at the effects of age and time spent in a Cantonese-English bilingual preschool. A vocabulary tool developed specifically for this population will be compared with two available standardized assessment tools in English. Finally, the test results of five children who are receiving speech-language services will be compared with age- and language-matched typically developing peers.

Vocabulary development is a fundamental aspect of children’s language acquisition. In the past decades, there has been growing research into the area of lexical-semantic development in bilingual children (e.g., Kan & Kohnert, 2005; Sheng, Liu, & Kan, 2011). It is no easy task to determine whether a bilingual child has a language disorder or whether the child is simply following a typical process of acquiring a second language (e.g., Håkansson, Salameh & Nettelbladt, 2003; Anderson, 2004; Kohnert, 2008). Children who begin learning a second language in the preschool years do not perform the same as monolingual children on standardized assessments; rather their scores on standardized assessments are below expected levels (Bialystok, 2008). The assessment tools available for detecting language disorders in children are not appropriate for the unique speaker-hearer that is a bilingual child. This combination of factors results
in difficulty in distinguishing between language differences and language disorders in bilingual children.

This study attempts to understand in greater depth vocabulary development in early sequential bilingual Cantonese-English speaking preschool children, an understudied population. I will be comparing children’s results on a more culturally and linguistically appropriate assessment tool for vocabulary knowledge in Cantonese-English speaking preschool children with two commonly used vocabulary assessment tools (i.e., the Receptive One Word Picture Vocabulary Test (ROWPVT) and the Expressive One Word Picture Vocabulary Test (EOWPVT) for monolingual English-speaking children.

When examining proportions of students receiving special education services, the complexity of identifying bilingual children with a language disorder is evident. A range of studies show that children are often over-identified, under-identified or misidentified as having a language disorder (Kohnert, 2008). For instance, younger bilingual children may go undiagnosed as having a language disorder, with their difficulties simply attributed to second language learning (e.g., Samson & Lasaux, 2009). Older bilingual children are often significantly over-identified as being ‘at risk’ for language impairments (e.g., Westman, Korkman, Mickos & Byring, 2008) or diagnosed with ‘severe language impairment’ (e.g., Salameh, Nettlebladt, Häkansson, & Gullberg, 2002). School-aged English language learners (ELLs) are often disproportionately enrolled in special education settings (e.g., de Valenzuela, Copeland, Qi & Park, 2006; Artiles, Rueda, Salzar, & Higareda, 2005). The way in which language assessments are conducted, and the consequent inappropriate educational placement of sequential bilingual children, may
be due to, in part, misunderstandings of language proficiency and second language acquisition (Gutiérrez-Clellen, 1996).

The number of children who are bilingual is increasing rapidly (National Center for Education Statistics, 2009), so understanding their language development is important. Studying the vocabulary development of early sequential bilingual children can give us further insight into children’s language, experience and general cognitive mechanisms (e.g., Kohnert et al., 2009), into the environmental factors that facilitate growth or loss of a sequential bilingual child’s L1, and into ways to distinguish between language disorder and language difference in developing bilingual children.

The literature review below explores lexical-semantic development in monolingual and bilingual children with and without language disorders. Next, an overview of what is known, thus far, about the progression of L1 and L2 language skills in early sequential bilinguals will be provided. Finally, methods that have been used to assess bilingual child’s vocabulary skills will be discussed.

**Lexical-Semantic Development in Monolingual Children**

During the preschool years, there is a blossoming in a child’s language from combining simple words about the immediate environment (of the here and now) to having paradigmatic semantic networks about abstract and complex concepts (Kaderavek & Justice, 2004; Kamhi & Catts, 2005; Kohnert & Kan, 2007). The vocabularies of monolingual children from middle-class families soar from approximately 1,000 words at 3 years of age to between 6,000 and 14,000 words by age 5 (e.g., Kohnert, 2008; Hirsh-Pasek & Golinkoff, 2002; Bloom, 2000). At this age, learning a word involves
connecting the phonological form of the word to its meaning, as well as knowing how the word can combine with morphemes and the possible syntactic roles it can fulfill (Clark, 1993). Understanding the meaning of words is fundamental to a child’s language development (Rice & Watkins, 1996). Children’s impressive lexical abilities at this age are thought to be indicative of the skills they will have down the road, particularly as indicators of future literacy skills and academic success (e.g., Adams, 1990; Chaney, 1994; Kastner, May & Hildman, 2001; Ouellette, 2006; Ricketts, Nation & Bishop, 2007; Rohde & Thompson, 2007; Swanson, Rosston, Gerber, & Solari, 2008; Tunmer et al., 1988).

Research shows that monolingual children learn new vocabulary from a variety of experiences at preschool and at home (DeTemple, 2001; Hart & Risley, 1995; Hubbs-Tait et al., 2002; Nagy, Anderson, & Herman, 1987; Patterson, 2002; Reese & Cox, 1999; Rice, Huston, Truglio, & Wright, 1990; Snow & Goldfield, 1983; Tabors, Roach, & Snow, 2001; Tabors, Snow, & Dickinson, 2001; Vermeer, 2001; Wells, 1985; Whitehurst et al., 1994). For instance, at school, children learn while being taught, read to, and while interacting with teachers and peers. At home, children learn new vocabulary while watching television, during joint book reading time, and while interacting with parents, siblings and friends.

In monolingual children, research shows that the size of a child’s vocabulary is strongly correlated with exposure (e.g., Hart & Risley, 1995). For example, Hoff (2003) compared the lexical development of monolingual children in families from middle- and high-socioeconomic classes. She found that children whose mothers spoke in longer utterances, using a more diverse vocabulary, built their expressive vocabulary at a faster
rate than children whose mothers had shorter utterances and less variety in their vocabulary.

The mechanisms by which children acquire new vocabulary through exposure to the language in their environment include fast mapping and quick incidental learning (QUIL). In fast mapping, a critical initial stage in learning words, a child links the phonological properties of a novel word with lexical or syntactic information after only one or two exposures (e.g. Kan & Kohnert, 2008). In QUIL, children learn words in discourse when there are fewer cues that match the form to the referent (Oetting, Rice, & Swank, 1995; Rice, Buhr, & Nemeth, 1990; Rice & Woodsmall, 1988). Children can also learn new words when being explicitly taught words (Biemiller, 2006). Children build their lexicons in a variety of ways, learning as many as nine new words each day (Bloom, 1973; Clark, 1993; Templin, 1957).

An insufficient lexicon has been documented in a wide range of language disorders though the extent is unknown (Dollaghan, 1987). Difficulties with lexical acquisition, including QUIL, in children with LI have been revealed in studies (e.g., Rice et al., 1990). There are also many reports of less accuracy in picture naming (e.g., Lahey & Edwards, 1999; Leonard et al., 1998). Thus, the ability to accurately measure lexical skills in all children who may have language impairments is critical. Measuring expressive and receptive vocabulary knowledge is commonly part of screens or assessment tests that are used with children, including those of preschool age.

Among monolingual children, it is generally accepted that comprehension of words precedes production of words (e.g. Fenson, Dale, Reznick, & Bates, 1994). This is reflected in children’s scores on vocabulary assessments, with children’s expressive
vocabularies generally larger than their receptive vocabularies (e.g., Benedict, 1979). Picture identification is often used to assess receptive vocabulary, or comprehension, and picture naming to assess expressive vocabulary. The task of picture identification to assess vocabulary comprehension is used in tools like the Receptive One Word Picture Identification Test. Rice and Watkins (1996) provide a very thorough discussion of all the ways in which picture identification can give insight into children’s lexical acquisition. At its most basic, however, picture identification assesses a child’s vocabulary comprehension. Generally, children enjoy looking and pointing at pictures (Binet & Simon, 1916). In picture identification, children are required to understand the task, comprehend the word and then point to the corresponding picture.

The relatively complex process of picture naming that measures a child’s vocabulary and involves three cognitive processes (Johnson, Paivio, & Clark, 1996). The first of these stages are identifying the object. Then, the child must activate and select the appropriate word, among all of their words. In the final stage a lexical response is generated by executing articulatory commands. Problems with picture naming could be due to difficulties at any of these stages such as general processing difficulties, a limited vocabulary or spare semantic representation, word finding difficulties or phonological difficulties.

Children, both monolingual and bilingual, exhibit vocabulary growth without marked discernible increases in grammatical skills until a certain threshold of vocabulary knowledge is reached (Caselli, Casadio, & Bates, 1999; Marchman & Martinez-Sussman, 2002; Thal, Bates, Goodman & Jahn-Samilo, 1997). In a cross-sectional study of bilingual toddlers, Marchman, Martinez-Sussman and Dale (2004) concluded that
mastery of vocabulary is a core part of what makes grammatical acquisition possible. Thus, understanding lexical-semantic skills is crucial to understanding grammatical deficits, which is a primary characteristic in monolingual children with language impairments (Leonard, 1998). Little is known about bilingual children’s lexical development, and hardly any research has been conducted with early sequential bilingual children whose home language is Cantonese.

**Lexical-Semantic Development in Early Sequential Bilingual Children**

While English is the most commonly spoken language in the United States, increasingly, children are speaking more than one language. Among preschoolers in Head Start programs in the United States, 30 percent of children are learning two languages (Hammer et al., 2012). In the 15 years between 1992 and 2007, the percentage of 5- to 17-year-old children who spoke a language other than English at home rose from 9 percent to 20 percent, with nearly 11 million children speaking a language other than English at home (National Center for Education Statistics, 2009). This proportion is expected to double by 2030 (Davis & Bauman, 2008). Understanding more about the language development in these bilingual children is imperative if we are to accurately identify which children have language disorders and provide adequate services for them.

Bilingual researchers tend to define “bilinguals” as individuals who show “both regular use and communicative competence” in both languages (Grosjean, 1992, pp 51). In practice, language proficiency and language use are used to determine the relative proficiency of each language. For example, a bilingual is considered to be proficient in a second language, when their L2 or both of their languages meet native speaker
expectations of vocabulary size or grammatical skills (see Bedore et al. 2012 for review). A bilingual often has a language which is more dominant, which means that the relative proficiency of one language is higher than another (Gathercole & Thomas, 2009) or the language to which the child has the most exposure (Grosjean, 2010). While children are developing however, one language might not be completely dominant. Children’s strengths and weaknesses may be spread between the two languages spoken (e.g., Kohnert et al., 2009). Bilingualism is usually not balanced perfectly in an individual, with both languages spoken equally and fluently, “like two monolinguals in one person” (Grosjean, 1989).

The terms *simultaneous* and *sequential* bilingualism are used to describe the different contexts in which bilingualism can develop. Although there is some debate about the details of classification (e.g., Genesee, Paradis, & Crago, 2004), in general, an individual who has had exposure to both languages from birth is referred to as simultaneous bilingual. The term early sequential bilingual indicates that the individual was exposed to and has already established one language from birth, and acquires their second language later, for instance, when entering preschool at age 3 (Hammer et al., 2004). The early sequential bilingual children that will be discussed in this study learn a minority L1 language (Cantonese) from birth, and begin learning the majority L2 language (English) upon entering preschool.

This is reflected in the research, which shows that bilingual children have smaller vocabularies in each language than children who speak one of those languages (e.g., Bialystok, Luk, Peets & Yang, 2010; Oller, Pearson & Cobo-Lewis, 2007; Peña, Iglesias, & Lidz, 2001; Peña, & Quinn, 1997; Schiff-Myers, 1992; Umbel, Pearson, Fernández, &
Oller, 1992). These smaller vocabularies will set off red flags on standardized tests designed for monolinguals. For example, a study that compared large samples of bilingual children to monolingual children’s performance on the Peabody Picture Vocabulary Test (PPVT), a test measuring receptive vocabulary, showed that the mean standard score for bilinguals was significantly lower than that of monolingual English speaking children (Bialystok et al., 2010).

However, typically developing bilingual children’s language is not compromised, rather, their combined vocabulary is found to be equal to or greater than the vocabulary of monolingual children. Bilingual children’s vocabulary is organized differently than monolingual children. They do not simply have two separate, identical and growing vocabulary stores. Bilingual children’s vocabulary knowledge is spread across two languages. Children may learn different sets of words in different situations in their lives, depending on the language of that context (Bialystok et al., 2010). Whereas typically-developing bilingual children have a higher level of language in one or more languages, bilingual children with language impairments tend to have lower language skills in both languages (e.g., Håkansson, et al., 2003).

Language development in bilingual children is highly dynamic, changing with age and exposure to each language (Kohnert et al., 2009). With great diversity in the language experiences of bilingual children, a child’s language proficiency and dominance vary greatly and change as they mature (Kohnert & Bates, 2002). Children’s dominance will shift gradually, and different domains may be dominant in each language at different times in a child’s development. Bilingual children often exhibit idiosyncratic dominance in different domains (e.g., Paradis et al., 2003), which will fluctuate as a child gets older.
Bilingual children may show an increasing lexicon without noticeable growth in grammatical skills until a certain number of words are acquired (Caselli, Casadio, & Bates, 1999; Marchman & Martinez-Sussman, 2002; Thal, Bates, Goodman, & Jahn-Samilo, 1997). Growth in a bilingual child’s vocabulary and grammatical skills will therefore not necessarily correspond. For example, children followed longitudinally and tested at regular intervals exhibited shifts in dominance when measured by Mean Length of Utterance (MLU, Yip & Matthews, 2006) and in phonology, semantics and syntax (Verhoeven, 2007).

There is even variation between children, who may be in very similar circumstances, due to individual characteristics in language processing skills (Castilla, Restrepo, & Perez-Leroux, 2009; Conboy & Thal, 2006). A child’s language learning skills may even differ between their languages (Castilla et al., 2009; Conboy & Thal, 2006; Pearson, Fernández, Lewedeg, & Oller, 1997).

While a monolingual child’s language input is concentrated in one language, bilingual children receive less input in each language they are learning and have less opportunity to practice each language (e.g. Peña, Gillam, Bedore, & Bohman, 2012). As with monolingual children, bilingual children’s vocabulary is correlated with exposure in each language (Marchman & Martinez-Sussman, 2002; Marchman, Martinez-Sussman, & Dale, 2004; Pearson, Fernández, Lewedeg, & Oller, 1997). Due to the different contexts in which bilingual children speak their languages, they often have substantial vocabulary knowledge in one language that they do not have in the other, and vice versa. Bilingual children may be adding the same words in both languages to their lexicon (translation equivalents or doublets) or different words in each of their vocabularies, for
which they have no equivalent in the other language (*singlets*) (Pearson, Fernández, & Oller, 1995). When children are tested, they tend to perform below the mean in vocabulary tests in each language (Umbel, Pearson, Fernández, & Oller, 1992). Studies indicate that the languages of bilingual children range from a 14.6% overlap in 16- to 17-month olds and 37.2% overlap in 22- to 23- month olds (Pearson, Fernández, & Oller, 1993) to approximately a 65% overlap in vocabulary in first graders (Umbel, Pearson, Fernández, & Oller, 1992).

The organization of bilingual semantic systems is a complex topic of great interest, particularly theories about the extent to which the semantic systems of bilinguals are shared or separate, and how they are organized (see Francis, 1999, for an extensive review). The Revised Hierarchical Model (RHM) focuses on the different strategies bilinguals use in building their lexicons as their experience with their L1 and L2 grows (Kroll, van Hell, Tokowicz, & Green, 2010). The RHM model incorporates the word association model and the concept mediation model described by Potter, So, Von Eckardt, and Feldman (1984). In the RHM, mapping the word to the concept depends on the phonology and lexical system of each language. However, the L1 and L2 share conceptual representations. When learning vocabulary, the RHM posits that individuals initially gain access to concepts in their L2 through the L1. Once individuals are more fluent in their L2, they no longer mediate through the L1, but have links directly between each lexicon and the concept. Experimental evidence strongly suggests that picture naming in fluent bilinguals is concept mediated in both L1 and L2 (Francis, Augustini, & Sáenz, 2003; Sholl, Sankaranarayanan, Kroll, 1995).
At the same time as sequential bilingual children are immersed in their L2, they are using their L1 less often. It is likely that, by using the language less frequently, the size of the lexicon used shrinks, which can lead to an eventual loss of vocabulary (Kravin, 1992). Without additional L1 support, a child’s dominant language may shift from the L1 to the L2 as they develop (Paradis, 2007). Evidence suggests that children can lose their first language relatively quickly once they begin learning a second language, a process called language loss, or attrition (Paradis, 2007). This phenomenon has been called ***subtractive bilingualism***, so named by Wallace Lambert (Lambert, 1975, 1977, 1981). Research shows that this may occur the fastest in children who learn L2 at a younger age (Mägiste, 1992; Jia & Aaronson, 2003). Most research in the area of L1 loss has shown that one of the areas greatest affected are an individual’s vocabulary (Gal, 1989; Smith, 1989; Weltens & Grendel, 1993). The domain of semantics has been seen to shift dominance between languages earlier than other domains in early sequential bilingual children (Bedore et al., 2012).

In a large-scale study of Spanish-English sequential bilingual children, Wong Fillmore (1991) pointed to beginning to learn the majority L2 language during the preschool age as a major factor contributing to L1 attrition. Families who attended English-only or bilingual preschools were more likely to describe their children’s L2 skills as deficient or non-existent.

In a longitudinal case study of a Spanish-English bilingual child, Anderson (1999) observed a noticeable decline in a child’s use of different nouns and verbs across time. For instance, the child would use general terms such as demonstrative pronouns (e.g. *eso*, that one), rather than the specific appropriate noun. Anderson (2004) suggests that one
way in which a lexicon may shrink is that children begin using earlier linguistic forms in the L1.

Kohnert (2007) suggests that a child’s L1 may be more vulnerable to attrition when there are great linguistic and cultural differences between the child’s home language and the community language. For example, in Kan and Kohnert’s (2005) study of Hmong-English speaking preschoolers, rapid growth in the English lexicon was seen while lexical skills in Hmong had stabilized. A similar study was done with Mandarin-English speaking children aged 3-8 years (Sheng, Luk, & Kan, 2011). Their results showed a relative stagnation of Mandarin skills in comparison to significant growth of English lexical skills.

In a longitudinal study done over two years, Hammer, Lawrence and Miccio (2008) evaluated the receptive vocabularies of simultaneous and sequential Spanish-English speaking bilingual preschoolers in Head Start programs. They found that although bilingual children’s Spanish and English improved during the preschool years, the Spanish (L1) language growth was not as much as that of their English (L2) language growth. A negative pattern was noted in the children’s auditory comprehension of Spanish. Indeed, other studies have shown regression or loss of L1 proficiency (Francis, 2005; Jia & Aaronson, 2003; Leseman, 2000).

In contrast, a few studies have shown that with the introduction of the L2 there is continued growth in the L1, though it is slower than expected (Cobo-Lewis, Pearson, Eilers, & Umbel, 2002; Gathercole & Thomas, 2009; Jia, Kohnert, Callado, & Aquino-Garcia, 2006; Kohnert & Bates, 2002; Kohnert, Bates, & Hernandez, 1999; Rodriguez, Diaz, Duran, & Espinosa, 1995; and Winsler, Diaz, Espinosa, & Rodriguez, 1999).
There are a host of psychological and social-environmental factors that can affect proficiency in L1 and L2, such as more exposure to the L1 and community support for the minority language (Anderson, 2004; Paradis, 2007; Pearson, 2007).

In summary, extensive research shows that children who speak a minority L1 experience a shift to dominance in the majority L2, particularly after early exposure to the L1 during the preschool years. If the child’s lexical-semantic development in the L1 does not actually regress, it levels off or slows its pace.

**Assessing Lexical-Semantic Skills**

Language disorders are the most common developmental problem observed in preschool children in the United States (Rossetti, 2001). Having a language impairment means that the development of a child’s language is significantly delayed in comparison to development of other areas, such as nonverbal intelligence and socio-emotional skills (e.g., Håkansson, Salameh & Nettelbladt, 2003). Many children with language impairments begin to talk at a later age (Rescorla, 2005). Extensive research on language impairment in monolinguals has been done (for an extensive review see Leonard, 1998). Consistent evidence indicates that monolingual children with language impairment have a slower than expected lexical (Crystal, 1987) and grammatical development (Leonard, 1998). Bilingual children with language disorders exhibit difficulty with a range of linguistic characteristics, depending on features that are specific to each language (e.g., Kohnert et al., 2009). While research on semantic organization in bilingual children with language impairments is limited, bilingual children with language impairments appear to have more shallow semantic representations, with semantic networks that are more sparse.
and poorly connected than typically developing bilingual peers (see Peña, Kester, & Sheng, 2012, for a summary).

Evaluation of language skills in bilingual children is quite a challenge (e.g., Kapantzoglou, Restrepo, & Thompson, 2012). Not only can typically developing bilingual children exhibit similar characteristics as children with language impairments, but the assessment tools we have to differentiate between these groups are insufficient.

Picture naming and picture identification tasks, such as the Peabody Picture Vocabulary Task (PPVT, Dunn & Dunn, 1997; Dunn et al., 1986), the Expressive One Word Picture Vocabulary Test-Revised (EOWPVT-R, Gardner, 1990) and Receptive One Word Picture Vocabulary Test (ROWPVT, Gardner, 1985) are very commonly used to assess the breadth of a child’s vocabulary.

Traditionally, in assessing vocabulary knowledge, Speech Language Pathologists rely on standardized assessments. The ease in administering and scoring makes them cost efficient, as well as the “easily quantifiable, rather than messy and complex, displays of skill and knowledge” (Wolf, Bixby, Glenn, & Gardner, 1991, p. 43). When we are attempting to determine what is typical or atypical language, we rely on language ability standards that are based on socially constructed sets of rules that dictate appropriate or idealized ways of speaking (Erickson, 1984; Gumperz, 1982). Language tests operate on the presumption that there is a great deal of homogeneity of exposure to the items in the test (Figueroa & Garcia, 1994) and to the sociolinguistic aspects of test-taking situations within groups of test takers (Mehan, Hertweck & Meihls, 1986; Miller-Jones, 1989).

Oftentimes, in clinical practice, due to an insufficient number of bilingual clinicians, if there is concern about a bilingual child’s language, they may be assessed
solely in English. In general, when bilingual children are tested only in the mainstream language, they perform more poorly than monolingual children (Bialystok, Craik, & Luk, 2008; Bialystok et al., 2010; Pearson, Fernández, & Oller, 1993). This is likely because their language experience and knowledge are spread between two languages (e.g., Bialystok et al., 2008; Umbel, Pearson, Fernández, & Oller, 1992).

Assessing a child in their L1 is not necessarily a solution either, however, even if a standardized assessment tool is available in that child’s L1. When a child is assessed in their first language, the norms still apply to monolingual children and not necessarily to bilingual/multicultural children (Horton-Ikard & Ellis Weismer, 2007; Restrepo & Silverman, 2001). Also, unfortunately, many assessment tools have been directly translated from English into a second language. In Langdon’s (1992) review of 21 Spanish language tests, she found that not only had many tests been translated directly from English to Spanish, but none had adequate reliability data and many were not normed or were poorly normed. For example, the Peabody Picture Vocabulary Test (PPVT, Dunn et al., 1986), a very common measure of vocabulary, was translated into Spanish to be the Test de vocabulario imagenes-Peabody (TVIP; Dunn, Padilla, Lugo, & Dunn, 1986). However, the dialect used in the assessment tool is inappropriate for the majority of Spanish-speaking children in the USA (Castillan Spanish vs. Mexican Spanish), the words in Spanish are not used in the same frequency in English, and the tool was normed with ‘preposterous’ assumptions about culture and language (Prewitt Diaz, 1988; Tomayo, 1987). Fernández, Pearson, Umbel, Oller, and Molinet-Molina (1992), in using the TVIP for their research, also found that these differences made some
items that appear earlier on in the task more difficult than items that appear later in the task, placing children at a disadvantage for they reached the ceiling sooner.

Rather than use tools that are either directly translated from English, or are intended for monolinguals, a bilingual child should be assessed in both languages (Chamberlain & Medinos-Landurand, 1991; de Montford Supple, 1996). To gain an understanding of the child’s language development, a tool that has been designed specifically for bilingual children, that meet reliability and validity criteria, should be used (Restrepo & Silverman, 2001). This current study sets out to begin developing a tool that is linguistically and culturally appropriate for early sequential Cantonese-English speaking children.

**The Current Study**

This study examined the lexical-semantic development in children who speak Cantonese (L1) as a home language and start to learn English (L2) in preschool settings. Cantonese is the third most popular language in the United States (Lewis, 2009) and the second most influential variety of Chinese (Fung, 2009) after Mandarin. There are estimated to be 55.5 million Cantonese-Chinese speakers in the world, with 94% in southern China, and the cities of Hong Kong and Macau (Lewis, 2009). Spoken Cantonese is different from English in that it is a monosyllabic tonal language and uses classifiers for nouns.

The Cantonese-English bilingual participants were recruited and tested in a Head Start program in San Francisco, CA. San Francisco is home of the country’s oldest of the prominent American Chinatowns still in existence. Tsui (2009) provides a detailed description of San Francisco’s Chinatown, detailing the constant flow of immigrants,
with families moving out and new immigrants moving in, drawn by affordable rents and available community services. Immigration here tends to be family-based, and largely built of people emigrating from Guangdong Province, a Cantonese-speaking area in southern China. San Francisco’s Chinatown is considered a gateway for new residents and a refuge for old ones. Tsui reports that while many adults continue to speak their first language, they strongly wish for their children to learn English well.

In this study, I examined the vocabulary development of these Cantonese-English speaking early sequential bilingual preschoolers. I explored this population’s lexical-semantic development, cross-sectionally examining how their Cantonese vocabulary changes as they spend more time in a Cantonese-English bilingual preschool. Picture naming and picture identification tools were developed to assess Cantonese-English speaking children’s vocabulary in both languages. Rather than a simple translation of an English-speaking standardized test into Cantonese, items were carefully selected that have high frequency of occurrence in Cantonese, English and in both languages. I compared the children’s performance on these tools to the standardized measures of the EOWPVT and ROWPVT. Finally, I compared the test results of these typically developing children with children receiving speech-language services.

There are two studies in this project. In Study 1, I examined typically-developing Cantonese-English bilingual children’s vocabulary development in both languages. The following questions were explored:

1. Is there a correlation between age and early sequential bilingual children’s vocabulary knowledge in L1 and in L2?
2. Is children’s L2 experience in school related to children’s vocabulary knowledge in L1 and in L2?

3. Is there a relationship between how children perform on the picture naming and picture identification tasks and the standardized measures of the EOWPVT and the ROWPVT?

In this study, picture identification and picture naming tasks were developed in Cantonese and in English to probe age-related changes in cross-language distribution of lexical knowledge.

I expected that the results analyzing the children’s language skills would replicate what has been found in previous studies (e.g., Kohnert & Bates, 2002; Leseman, 2000; Schaarlaekens et al., 1995). My hypothesis is that there are effects of age and language on both measures. However, on the basis of previous studies (e.g., Leseman, 2000), I anticipated that there would be an interaction between age and language skills. I predicted that older children would outperform younger children on the vocabulary tasks in English while children’s vocabulary skills in Cantonese would not show a great increase.

Previous studies show that while English is supported at home and in the larger community, the amount of Cantonese used at home typically remains stable (e.g., Pearson, 2007).

I examined the correlation between the children’s vocabulary skills in both languages and the extent of their L2 experience in school, as indexed by months studying in school. I predicted that as the children spend more time at school, with an increased exposure to English, their vocabulary skills in English would be more developed (e.g., Pearson, 2007).
I explored the correlation between how children perform on the measures we developed compare to the standardized measures of the Expressive One Word Picture Vocabulary Test (EOWPVT) and the Receptive One Word Picture Vocabulary Test (ROWPVT). The picture naming and picture identification tasks that were developed included items that were likely to be singlets in both English and Cantonese, as well as words that are likely to be translation equivalents. The EOWPVT and ROWPVT were developed for measuring children’s receptive and expressive English vocabulary with words that are culturally Anglo-American.

I had considered both possibilities in my predictions, uncertain as to whether there would be a correlation or not among these measures. I had estimated that there may be correlation between the English language picture naming and picture identification measures and the standardized measures because the children do have exposure to English, including some vocabulary that children who grow up in mainstream families have. These children have learned English mainly in preschool settings and may be familiar with the items from EOWPVT and ROWPVT. However, I also considered the possibility that since the children’s Cantonese lexicon was not considered, there may not be a correlation.

In Study 2, I will compare the test results of children who receive Speech-Language therapy services with the larger group of typically developing children using the picture naming and picture identification tasks that were designed for this population. I predict that the results of these children on the picture naming and picture identification will be noticeably different from the larger sample of typically developing children.
Study 1

Method

Participants.

Participants included 70 children ranging in age from 3;0 to 5;4 years of age. The average participant age was 4;5. Cantonese, the minority language, is spoken mostly at home and receives little support beyond the home setting. Children begin learning English upon entering a Head Start program in San Francisco, CA. Participants had an average of 1.5 years experience at Head Start, ranging from 1 month to 2.5 years. These participants were from low-income families in the San Francisco area. Table 1 provides further details about the participants, including their scores on the picture naming and picture identification tasks.

Table 1
Participant Information

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>36</td>
<td>65</td>
<td>54.3</td>
<td>7.7</td>
</tr>
<tr>
<td>Time in school (months)</td>
<td>1</td>
<td>29</td>
<td>17.1</td>
<td>7.6</td>
</tr>
</tbody>
</table>

All children in Study 1 were typically developing, as reported by parents and teachers. A parent of each child completed a questionnaire regarding the child’s language and educational history with the assistance of a Cantonese-speaking teacher they were familiar with (See Appendix A for the questionnaire used). Children were determined to be typically developing if they were reported to have age-expected progress in school and normal motor, cognitive, social-emotional, speech and language development as reported by parents and teacher (e.g., Gray, 2003).
Procedures.

**Cantonese-English bilingual vocabulary tasks.**

A picture naming task and a picture identification task in Cantonese and English were developed to measure children’s receptive and expressive vocabulary skills. Target items included words that were consistent with children’s cultural experience in Cantonese-speaking and English-speaking settings (see Appendix B for a list of all items). Although predominately nouns, the target items included a mixture of concrete objects, animate beings, verbs, and adjectives that are culturally appropriate for Cantonese-English bilingual children growing up in the United States. ‘Ginger’ and ‘bitter’ were items in the Chinese tasks. ‘Ice cream’ and ‘bicycle’ were items from the English-only tasks. Examples of items consistent with both cultures include a picture of a ‘hand’ and a ‘car’. The stimuli were selected from the MacArthur Communicative Development Inventory (MCDI, Fenson et al., 1991; 1996), a Chinese adaptation of the MCDI (Tartiff & Fletcher, 2008) and from a study of name agreement between Chinese and American English speakers (Yoon et al., 2004). Photographs of each target were selected from *Art Explosion Photo Objects* (Nova Development, 2006), and from *Google image*. The picture naming tasks consisted of 102 pictures. The picture identification task consisted of 90 pictures. Each array included three foils in the same semantic category as the target item. All pictures were carefully selected as to correctly represent the meaning of the word from a Chinese-American perspective. Disagreements between American and Chinese researchers designing the task arose on specific items (for instance, ‘truck’ was perceived differently from their different cultural backgrounds). Target items were not repeated across the picture naming and picture identification tasks. All target items and
picture identification foils were identical in both English and Cantonese. The language of testing was counterbalanced within each participant group.

The two tasks were administered in Cantonese and English on two different occasions. Trained personnel, who were native speakers of the respective language, conducted testing with each child individually in a quiet space at the child’s school. Practice items preceded each experimental task.

In the Picture Naming task, picture stimuli were presented individually on an iPad. The question, “What is it?” was asked for pictures of nouns that were shown in the English session, and “呢個係乜野呀?” (“What is it?”) in the Cantonese session. For verbs, the question, “What is he/she doing?” was asked. For adjectives, an object or individual was briefly described (e.g., “This man is tall”) and then the child was asked about another object or individual that illustrated the other extreme (i.e., “short”). The total number of pictures named in each language was recorded. Alternative responses reflecting dialectical or acceptable variations of Cantonese were credited. If a child did not respond after approximately 10 seconds, the item was scored as “no response.”

In the Picture Identification task, the target picture was shown with the three foils in a quadrant. The four pictures, equal in size, were shown to the children on the screen of an iPad. Instructions were to look at the pictures and point to the picture that best matched the word just heard (e.g. “Show me ____.”).

**Standardized measures.**

Trained personnel, native English speakers, administered the EOWPVT and the ROWPVT. Testing was conducted with each child individually in a quiet space at the
child’s school. Following the guidelines, examples of each task were completed with the child before commencing the test.

In the ROWPVT, the child was instructed to point to the picture that represented the word spoken aloud to the child. The EOWPVT was administered by using the prompt “What is this?” In both tasks, the basal was established by eight correct consecutive responses. The ceiling was reached when a child had six consecutive incorrect responses.

**Results**

To examine receptive and expressive vocabulary knowledge in Cantonese (L1) and English (L2), performance score in Cantonese (L1) and English (L2) were obtained, consisting of the total correct in each language. The maximum number of correct responses in Picture Naming was 81, and in Picture Identification was 84. The mean of all responses in each type of task was calculated, along with standard deviation, are shown in Table 2 below. A graph of the results, showing the mean percentage and standard error for each task in both languages, are shown in Figure 1.

Table 2
*Mean Scores on Picture Naming and Picture Identification Tasks*

<table>
<thead>
<tr>
<th></th>
<th>Cantonese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Score</td>
<td>70.23</td>
<td>60.09</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>9.42</td>
<td>15.69</td>
</tr>
</tbody>
</table>

*Note. PID=picture identification task, PN=picture naming task.*
Figure 1. Performance on vocabulary tasks in Cantonese and English

Results showed that on average, children’s receptive and expressive vocabularies in Cantonese were stronger than their English vocabularies. Receptive vocabulary: $F(1, 69) = 50, p < 0.001$; Expressive vocabulary: $F(1, 69) = 27.49, p < 0.001$.

Correlational analyses were conducted to examine the relationship between and across languages and tasks (See Table 3). There was a correlation between the children’s performance on the picture naming and picture identification tasks in both Cantonese ($r = .5, p < .01$) and English ($r = .89, p < .01$). There was a correlation between the scores in picture identification ($r = .65, p < .01$) and in the picture naming scores ($r = .24, p < .05$).
Question 1. Is there an age effect on sequential bilingual children’s vocabulary knowledge in L1 and in L2?

There is a strong correlation between age and lexical-semantic development, as measured by the tasks that were developed. In English, there was a correlation between age and the picture identification task (r = .39, p < .01) and between age and picture naming (r = .40, p < .01). In Cantonese, there was a correlation for picture identification (r = .40, p < .01), but no correlation with picture naming (r = .09, p > .05). See Table 4, below, for further details.

<table>
<thead>
<tr>
<th></th>
<th>PID-Cantonese</th>
<th>PN-Cantonese</th>
<th>PID-English</th>
<th>PN-English</th>
<th>ROWPVT</th>
<th>EOWPVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PID-Cantonese</td>
<td>1</td>
<td>.50***</td>
<td>.68***</td>
<td>.58***</td>
<td>.44***</td>
<td>.59***</td>
</tr>
<tr>
<td>PN-Cantonese</td>
<td>.50***</td>
<td>1</td>
<td>.24*</td>
<td>.21*</td>
<td>0.01</td>
<td>0.16</td>
</tr>
<tr>
<td>PID-English</td>
<td>.68***</td>
<td>.24*</td>
<td>1</td>
<td>.86***</td>
<td>.78***</td>
<td>.78***</td>
</tr>
<tr>
<td>PN-English</td>
<td>.58***</td>
<td>.21*</td>
<td>.86***</td>
<td>1</td>
<td>.82***</td>
<td>.89***</td>
</tr>
<tr>
<td>ROWPVT</td>
<td>.44***</td>
<td>0.01</td>
<td>.78***</td>
<td>.82***</td>
<td>1</td>
<td>.82***</td>
</tr>
<tr>
<td>EOWPVT</td>
<td>.59***</td>
<td>0.16</td>
<td>.78***</td>
<td>.89***</td>
<td>.82***</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: PID=picture identification task. PN=picture naming task.
*p<.05. **p<.01. *** p < 0.001
The scatter plot below, showing the correlation between age and picture identification scores in English, is an example of how the results appear.

Note: $PID_E =$ Picture Identification task in English.
**Question 2.** Is children’s L2 experience in school related to children’s vocabulary knowledge in L1 and in L2?

Similarly, the time spent in school (i.e., an indicator of L2 experience) was correlated with children’s vocabulary knowledge, on all tasks with the exception of picture naming in Cantonese. In Cantonese, there was a correlation with picture identification \((r = .42, p < .001)\), but no correlation with picture naming \((r = .11, p > .05)\). In English, time in school was correlated with picture identification \((r = .42, p < .001)\) and with picture naming \((r = .41, p < .001)\). See table 3 for more details.

**Question 3.** Is there a relationship between how children perform on the picture naming and picture identification tasks and the standardized measures of the EOWPVT and the ROWPVT?

Results showed very high correlations between performance on the EOWPVT and the ROWPVT for the picture identification or picture naming tasks in English (See Table 2). For receptive vocabulary, children’s ROWPVT scores were correlated with picture identification in English \((r = .78, p < .001)\). For expressive language, children’s EOWPVT scores were correlated with picture naming in English \((r = .89, p < .001)\). Moreover, there were correlations across modality in the English measures (EOWPVT and picture identification, \(r = .78, p < .001\); ROWPVT and picture naming, \(r = .82, p < .001\)). In addition, there was also a cross-language correlation between performance in the Cantonese picture identification task and on the ROWPVT \((r = .44, p < .001)\) and the EOWPVT \((r = .59, p < .001)\). There was no correlation between the standardized vocabulary assessment tools and the Cantonese picture naming tasks (ROWPVT: \(r = 0.01, p > .05\); EOWPVT: \(r = .16, p > .05\)).
Additional Analyses

Throughout testing, certain patterns of responses were observed in the children’s responses to the picture naming task in English. Frequently, children would impose a Cantonese way of saying a word onto English. For example, children might say, “baby car” (which is what stroller, or ‘BB车’ means when directly translated from Cantonese ‘child + car’). Other instances included overgeneralization of words in English. In Cantonese, sofa and chair both have the same word. In English, many children did not know the exact word for sofa, and so would simply call it, ‘chair,’ as they would in Cantonese. Children often did the same thing with the word, ‘shirt,’ using the same word to name t-shirt, button down shirt and jacket.

A final interesting, though less common, observation was the influence of pop culture on children’s naming in English. More than one child identified the image of a housecat as, ‘baby jaguar,’ much to the confusion and amusement of the people administering the task. It was only much later was ‘baby jaguar’ discovered to be the name of a character in the popular children’s television show, ‘Go Diego, Go!’ a spinoff of the show ‘Dora the Explorer.’

Summary of Results

In Study 1, it was found that age and time spent at school were correlated with children’s vocabulary test results in English and with picture identification in Cantonese. The standardized test results of the ROWPVT and the EOWPVT were correlated with the scores on the developed tasks in English and picture identification in Cantonese, but not the picture naming task in Cantonese.
Study 2

The main goal of Study 2 is to compare the test results of children with language impairments with the larger group of typically developing children. I will compare the data of these children with typically developing children who are in the same age range (within 1 month of one another) and who have been identified as having a similar language input at home. I predict that the results of these children on the picture naming and picture identification will be noticeably different from the larger sample of typically developing children. Possible clinical implications of doing this are that in the future, the picture naming and picture identification tasks could potentially be used as culturally appropriate screening tools for potential language impairments.

Method

Participants.

Participants were five children between 3;6 and 5;2 years of age. These five children were qualified to receive services from a speech-language pathologist and were on an Individualized Education Plan (IEP), receiving clinical services at the time of testing. Further details about the IEP or services received were unknown.

However, parents and teachers of each child stated that they had concerns about their language skills. Parents and teachers of preschool aged bilingual children have been found to be relatively reliable at describing their children’s language skills (Gutiérrez-Clellen & Kreiter, 2003; Thordardottir & Weismer, 1996). Additionally, with the exception of language, articulation or phonological problems, the parents reported no evidence of a neurological or additional developmental disorder.
Cantonese, the minority language, is spoken mostly at home and does not receive much support beyond the home setting. Children begin learning English upon entering a Head Start program in San Francisco, CA. These participants were from low-income families in the San Francisco area. These participants were matched with a typically developing peer who is within 1 month of the same age and has a similar language experience at home.

**Procedures.**

These five children’s receptive and expressive vocabularies were measured by the Cantonese-English bilingual vocabulary measures. The procedures were identical to those of Study 1.

**Analyses.**

I first identified age-matched typically-developing bilingual children from the participants in Study 1. These five children also had similar L2 experience with the children with IEPs. Then, I compared the scores of each child who has been identified as having an IEP and language difficulties, with the performance with his/her typically-developing peer.

**Results**

**Study 2** How do children with language impairments compare with the larger group of typically developing children using the picture naming and picture identification tasks?
Children who are receiving services for a language impairment were matched by gender and age (within one month) to a child who is typically developing. See Table 5 for a summary of their results.
<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>PID-C</th>
<th>PN-C</th>
<th>PID-E</th>
<th>PN-E</th>
<th>Age</th>
<th>Gender</th>
<th>PID-C</th>
<th>PN-C</th>
<th>PID-E</th>
<th>PN-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>5;1</td>
<td>Male</td>
<td>55</td>
<td>20</td>
<td>46</td>
<td>16</td>
<td>T1</td>
<td>5;1</td>
<td>Male</td>
<td>75</td>
<td>72</td>
</tr>
<tr>
<td>C2</td>
<td>3;11</td>
<td>Male</td>
<td>76</td>
<td>70</td>
<td>62</td>
<td>50</td>
<td>T2</td>
<td>3;11</td>
<td>Male</td>
<td>72</td>
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</tr>
<tr>
<td>C3</td>
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<td>78</td>
<td>47</td>
<td>81</td>
<td>65</td>
<td>T3</td>
<td>4;6</td>
<td>Female</td>
<td>83</td>
<td>74</td>
</tr>
<tr>
<td>C4</td>
<td>3;7</td>
<td>Female</td>
<td>43</td>
<td>53</td>
<td>27</td>
<td>16</td>
<td>T4</td>
<td>3;7</td>
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<td>C5</td>
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<td>49</td>
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<td>69</td>
<td>T5</td>
<td>5;0</td>
<td>Female</td>
<td>69</td>
<td>73</td>
</tr>
</tbody>
</table>

*Note: PID=picture identification task. PN=picture naming task. C=Cantonese. E=English.*
Analyses focus on the performance of the children with IEPs and their age-matched and L2-experienced matched children. Trends in the results of these two groups of children will be discussed. The results can be divided up into two case studies.

The first case study involves the children in cases 1 and 4 (C1 and C4) and their typically-developing peers. In comparing C1 and T1, there are very noticeable differences in their scores. The child who is on the IEP clearly had much lower scores on the tasks in both languages than the age-matched typically-developing child. C1 also scored better on picture identification than picture naming in both Cantonese and English. Similarly, C4’s scores were lower than her age-matched comparison T4, though not quite as strikingly as in cases C1 and T1.

Cases C2 and T2 look a little different, with scores that are very similar to one another. The only task in which there was a difference of more than ten points was in picture naming in Cantonese. C2, the child with an IEP, had a higher score than T2, the typically-developing child. The final two cases, C3 and T3, and C5 and T5, show a different pattern in their results from those previously discussed. In these two cases, the children on IEPs have nearly equivalent scores on picture identification in Cantonese when compared to the typically-developing children (C3 has 78, T3 has 83; C5 has 68 and T5 has 69), but moderately lower picture naming scores in Cantonese (C3 has 47, T3 has 74; C5 has 49 and T5 has 73). However, when comparing their scores in English, the children on an IEP perform better than the typically-developing children both in picture identification (C3 has 81, T3 has 73; C5 has 75 and T5 has 43) and picture naming (C3 has 65, T3 has 52; C5 has 69 and T5 has 4).
In summary, of five children who are receiving speech-language services, only one of them had lower scores in both Cantonese and English than their age- and language-matched typically-developing peer.

**Discussion**

Lexical-semantic development has been a focus in the early language development of bilingual children (e.g., Patterson, 1998, 2000). This project offers further insights into this, through the study of Cantonese-speaking children who begin learning English once they begin attending a bilingual preschool. Two measures were developed that were consistent with the language experiences of these young children; picture naming and picture identification. Each task was administered in English and Cantonese, the presentation counterbalanced across participants.

**Lexical-semantic Development in Typically-Developing Children**

Correlations in performance on these tasks were performed looking at the correlation with participants’ age, length of time of attendance at the preschool, and performance on standardized vocabulary tests (the EOWPVT and ROWPVT). This allows understanding of various factors that may correlate with vocabulary development, as well as a comparison between the tasks that have been developed for this Cantonese-English speaking preschool population with already-existing standardized tools for vocabulary in English.

The children’s scores were higher in picture identification tasks than in the picture naming tasks in both their L1 and L2. This is consistent with what is known about vocabulary acquisition in typical monolingual language learners, with lexical-semantic mappings receptively far outnumbering the number of words produced (Tomasello, 2003).
Additionally, this is in line with what has been found about lexical-sematic development in bilingual children, who may have an even greater difference in performance on receptive and expressive vocabulary tasks than monolingual children (Yan & Nicoladis, 2009).

Overall, participants scored higher in the Cantonese tasks than the English tasks (See Figure 1). Although the children have a wide range of language experiences, they have had most exposure to Cantonese at home from birth, and only beginning to learn English once they began preschool. This is consistent with what is known about how language experience and usage are correlated in bilingual children. Among older sequential bilingual children, it has been found that English, as the majority language and the language used in academic settings (e.g., reading and writing), can have a disproportionately high effect on children’s lexical-semantic knowledge in toddlers (Pearson et al., 1997) and elementary school children (Oller & Eilers, 2002). It is likely that their dominance would shift to their L2 in the coming years, as other studies have found (eg. Kohnert & Bates, 2002; Kohnert, Bates, & Hernandez, 1999). Further longitudinal studies are needed to see how their relative vocabulary skills shift with more exposure to English.

I made several predictions about the performance of the participants in response to the picture identification and picture naming tasks. My prediction that children’s age and length of experience at preschool would be correlated with their time spent at school was correct, for the most part. Picture identification in Cantonese and English, and picture naming in English correlated with age and time spent in preschool. The picture naming scores in Cantonese did not correlate with age or time in school, however. In contrast
with previous studies in which vocabulary growth was only in L2 but not in L1 (e.g., Kan & Kohnert, 2005; Leseman, 2000), picture identification scores in L1 were correlated with age.

Additionally, it was predicted that there may or may not be a correlation between performance on the tasks developed and the standardized tools. There was, however, quite a correlation, especially with the English tasks and the picture identification tasks in Cantonese. Once again, however, there was not a correlation with picture naming in Cantonese.

Correlation between picture identification in Cantonese and English measures may suggest that there is a relationship between a child’s receptive lexical-semantic skills in their L1 and developing vocabulary in their L2. Though vocabulary appears to be a more cross-linguistically independent domain (Cobo-Lewis, Eilers, Pearson, & Umbel, 2002; Conboy & Thal, 2006; Simon-Cereijido & Gutiérrez-Clellen, 2009), the children’s skills in Cantonese may be helping them acquire new words in English.

A possible explanation for this lack of correlation with picture naming in Cantonese is that the children are experiencing effects on their L1 from the introduction of the L2. The task of picture naming requires that children have a more solid grasp of a word before they are able to produce it (e.g., Fenson et al., 1994, Benedict, 1979). It is possible that some children are beginning to experience a shift in L1 dominance to L2 dominance, or a weakening in their L1 skills, while others remain more dominant in L1. Other studies have documented a shift in dominance in sequential bilingual children, leading to a weakening in L1 skills as children’s L2 becomes stronger (Kan & Kohnert, 2005; Kohnert & Bates, 2002; Kohnert, Bates, & Hernandez, 1999). This could create a great
deal of variation in the children’s vocabulary knowledge in their L2, resulting in a lack of correlation in the L1 expressive vocabulary skills with age and time spent in school.

An alternative explanation is that due to the interaction between the children’s L1 and L2, there is not a correlation between expressive Cantonese vocabulary and age/time spent in school. Going back to the theories of a shared semantic representation, bilingual individuals have shared conceptual representation of translation equivalents in their languages (Francis, 1999). Previous studies have found that younger children have fewer translation equivalents in their lexicon (Kan & Kohnert, 2005; Pena, Bedore, Zlatic-Giunta, 2002). Kan & Kohnert (2005) found that children had a greater percentage of translation equivalents in picture identification than in picture naming. Perhaps interference occurs as children acquire new words in their L1, in the domain of expressive vocabulary, as shown in picture naming. Additional analyses would be needed to verify this hypothesis.

Additionally, the sheer number of factors that can affect a child’s language development should not be overlooked. The individual schools and homes the children come from will have some degree of variance in language input, which will impact vocabulary production (Pearson et al., 1997). Family perception of the L1 and L2, the education and fluency of the parents and number of interactions with peers in each language are only a few of the factors that impact a bilingual child’s language (Anderson, 2004). Finally, each individual child has their own process in emotional, cognitive and social development that can affect language acquisition (Bialystok, 2001).

Clinical implications of this study are the further validation of the importance of assessing bilingual children in both of their languages. Even in children as young as
preschool-aged are impacted by learning a majority L2. Children can be overidentified as having language disorders if they are not assessed appropriately (Samson & Lasaux, 2009).

**Language Disorders and Language Differences**

Despite having begun life as monolinguals, early sequential bilingual children’s language is different from that of monolinguals. Children with language disorders tend to have poorer language scores when assessed than children typically-developing children. Generally, one to two standard deviations below the norm is required to be diagnosed with a language impairment (Kohnert et al., 2009). Evidence is clear that vocabulary acquisition, so often used to diagnose language disorders, will look different in these children (e.g., Umbel et al., 1992). Vocabulary is a feature that identifies young children as having a language impairment (Rescorla, 2005). Bilingual children as a whole, even if they are typically developing, score lower on standardized tests designed for monolingual children (Oller et al., 2007; Bialystok et al., 2010). Attempting to assess these children for a language disorder, using solely their L1 or their L2, will be unsuccessful (e.g., Patterson & Pearson, 2012).

Language development has been found to be strongly correlated with exposure in monolingual (Hart & Risley, 1995) and bilingual children (Marchman et al., 2002; Marchman et al, 2004; Pearson et al., 1997). Especially given that children’s language skills in a given domain can shift as they mature (Kohnert & Bates, 2002), it is essential to evaluate bilingual children’s language skills in both of their languages (Håkansson et al., 2003). It is no surprise that bilingual children are so often misidentified as having a language disorder (Kohnert, 2008). In reality, their language development is different
from what, in the United States, is considered the norm: monolingualism. Using appropriate methods of assessing lexical development is necessary to distinguish between language difference and language disorder.

In this study, picture identification and picture naming tasks were designed to assess children’s expressive and receptive vocabularies in Cantonese and English. In the second part of this study, we compared children who are typically developing and children who are receiving speech-language services through an IEP. The assessment tool designed for this population was culturally and linguistically appropriate, using words that are frequently occurring in English, Cantonese and both languages. In contrast to my prediction that typically developing children would have higher scores than children with IEPs on these tasks, there was a great range in how the children scored on the tasks in comparison to one another.

Of the five children that were identified to have language issues, only one child (C1) had lower scores than his age-matched and L2-experience-matched typically-developing peer, C1 and T1, the case study where the typically developing child (T1) had scores much higher than the child on an IEP (C1), was closer to what I would have expected from all of the children who were suspected of having a language disorder. C1’s vocabulary skills were low in both Cantonese and Cantonese, when compared to T1, a typically developing, same-age, same-language background peer. Monolingual children with language disorders have been shown to have difficulties with receptive and expressive vocabulary (Leonard et al., 1998; Rice et al., 1990). In bilingual children with a language impairment, vocabulary skills would be low in both languages. C1’s low scores in both his L1 and L2 are consistent with the performance of a bilingual child with
a language disorder. In contrast, the other children (i.e., C2, C3, C4, and C5) had similar scores to their peers.

As previously discussed, the information we had about the children who are on IEPs was not extensive. One important unknown pieces of information is how, specifically, each child was assessed by the speech language pathologist. Children may have been assessed only in English, which would not have accurately portrayed the child’s language skills (eg., Bialystok et al. 2010). Additionally, assessing a child’s language using the Cantonese translation of English tools would not have been appropriate either (eg. Langdon, 1992). Although it may be possible that the children who are on IEPs were identified as needing services initially, but at the point that they were assessed for this study, had made gains in their skills and no longer needed them.

However, looking at the scores obtained by this small group of children on IEPs, the need for a culturally and linguistically appropriate tool for this population is apparent. Several of the children that were assessed may have a language difference, rather than a language disorder. A pattern observed among these children with IEPs was lower expressive vocabulary skills in Cantonese, but greater English skills. As many researchers have observed, bilingual children’s language skills are distributed between their two languages. These children, while their picture naming skills are not as high as their peers, have higher English vocabulary skills. As Håkansson et al (2003) noted, children with language disorders would not have strong language skills in either language (eg., Kohnert et al., 2009). It may be that these children are already showing signs of language shift. One possibility is that as their lexical-semantic knowledge grows in English, their Cantonese expressive vocabulary is leveling off or growing at a slower rate.
Several other studies have found that this happens in early sequential bilingual children learning a majority second language in preschool (e.g., Kan & Kohnert, 2005; Sheng et al., 2011). Further study of this population, with a larger sample of children with a language impairment, would be necessary to explore this possibility further.

The language development of a bilingual child is a complex process. Distinguishing between children who have a language difference, as they go through the process of acquiring a second language, and children with a language disorder cannot easily be done with the tools we have available. A vocabulary tool that is appropriate for this culturally and linguistically distinct bilingual population would be valuable in identifying any children who may have a disorder, distinguishing them from children who simply have a language difference.

**Limitations and Future Studies**

Limitations and ideas for future studies are discussed briefly. This study included early sequential Cantonese-English speaking preschool children from a low socioeconomic background. Whether these results can be applied to other Cantonese-English speaking children is unknown. Further studies into this population would benefit from examining the effects of a wider range of factors, such as a variety of socioeconomic backgrounds, families that have more of a mix of home-language patterns or schools that are strictly English-speaking only with children. Additionally, it would be interesting to study a population of early sequential Cantonese-English bilingual children who do not live in an area such as San Francisco’s Chinatown, and compare these results with those of an area with even less community support of the home language.
The comparison between the children on IEPs and the larger group of typically developing children is on such a small scale, is especially difficult to make when so little is known about the children who are on IEPs. In a future study, knowing the specific diagnosis of a child and a larger sample of children would be necessary to be able to gather information as to the performance of children with a language disorder on this tool, and as the usefulness of this tool for identifying Cantonese-English speaking children with language disorders.
References


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Appendix A

語言學習經驗
出生日期: ____________________ 年齡: ____________________ 性別 □ F □ M

1. 孩子的父親最高的教育是什麼? □ 沒有完成小學 □ 小學 □ 中學 □ 大學 □ 其他 ________
2. 孩子的母親最高的教育是什麼? □ 沒有完成小學 □ 小學 □ 中學 □ 大學 □ 其他 ________
3. 你有沒有擔心對孩子的語言, 聽力或學習的能力？□ 有 □ 沒有
   如果有，你有什麼擔心? (你可以選擇不回答)
   ___________________________________________
   如果有，你的孩子有沒有個人化教育計劃 (IEP)? □ 有 □ 沒有
4. 你的孩子在什麼年齡開始在啟明學校上學? ______
5. 你的孩子是不是在啟明學校開始學習英語? □ 是 □ 不是
6. 你的孩子在家說什麼語言的 (你可以選擇一項以上):
   □ 台山話 □ 粵語 □ 英語 □ 其他 ____________________________
7. 你的孩子在學校說什麼語言的 (你可以選擇一項以上):
   □ 台山話 □ 粵語 □ 英語 □ 其他 ____________________________
8. 你的孩子喜歡說那種語言? (你可以選擇一項以上):
   □ 台山話 □ 粵語 □ 英語 □ 其他 ____________________________
9. 你的孩子說那種語言說得較好? (你可以選擇一項以上):
   □ 台山話 □ 粵語 □ 英語 □ 其他 ____________________________
10. 一般來說你的孩子用多少時間種語言用以下語言的?
    台山話 _____ % 粵語 _____ % 英語 _____ % 其他 __________
11. 在以下環境或與以下的人, 你的孩子使用什麼語言？如果孩子使用超過一種語言, 請註明使用百分比。
    在家裡 ______% 台山話 _____ % 粵語 _____ % 英語 _____ % 其他 ______%  
    在學校 ______% 台山話 _____ % 粵語 _____ % 英語 _____ % 其他 ______%
當孩子閱讀時
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

當孩子閱讀、寫字時
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

當孩子看電視時
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

與他/她的父母
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

與他/她的祖父母
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

與他/她的哥哥姐姐
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

與他/她的弟弟妹妹
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

與他/她的朋友
台山話 ___ % 粵語 ___ % 英語 ___ % 其他 ___ %

12. 你的孩子 每週 用多少個小時間做以下的事情？...

看電視 (或錄像帶)? __________
與朋友一起玩? ________________
與兄弟姐妹玩? ________________
留在家中? ________________

13. 你的孩子多少個朋友講以下的語言?

單講粤語？ ______
單講英語？ ______
講粵語和英語？ ______
講其它語言？ ______
Language Learning Experience

Date of birth: ____________________  Age: ______________
Gender  □ F  □ M

1. What is the highest education the child’s father received? __________
mother? __________

2. Do you have concerns about the child’s speech, language, hearing or learning ability?
   □ yes □ no
   If yes, what are the concerns? (optional)
   _________________________________
   If yes, does your child have an IEP? □ yes □ no

3. At what age did the child start to go to school? ______

4. What language(s) does the child speak at home:
   □ Cantonese (including Tai San) □ English □ Other ____________________________

5. What language(s) does the child speak at school: □ Cantonese □ English
   □ Other ____________________________

6. Which language does the child feel more comfortable speaking? □ Cantonese □ English □ Other

7. In which language does the child feel he/she have better skills? □ Cantonese □ English □ Other

8. Did your child start to learn English at Kai Ming? □ yes □ no

9. At what age did the child start to go to Kai Ming? ______

10. In general what percent of your child’s time is spent using each language?
    Cantonese _____ %  English _____ %  Other ____________

11. What language(s) does the child use in the following settings or with the following people? If the child uses more than one language in each setting, please indicate the percent of your use in each language.

   ▪ at home  □ Cantonese ___ % □ English ___ %
     □ Other ________________  ____ %

   ▪ in school  □ Cantonese ___ % □ English ___ %
     □ Other _____  ____ %

   ▪ when the child read  □ Chinese ___ % □ English ___ %
     □ Other _____  ____ %
• when the child write □ Chinese ___% □ English ___% □ Other _______ ___% 
• when the child watch TV/video □ Cantonese ___% □ English ___% □ Other ______% 
• with parents □ Cantonese ___% □ English ___% □ Other _______ ___% 
• with grandparents □ Cantonese ___% □ English ___% □ Other _____________ ___% 
• with older siblings □ Cantonese ___% □ English ___% □ Other _____________ ___% 
• with younger siblings □ Cantonese ___% □ English ___% □ Other _____________ ___% 
• with friends □ Cantonese ___% □ English ___% □ Other _____________ ___% 

12. How many hours a week do the child spend
• watching TV or video? ____________
• with friends? _________________
• with siblings? _________________
• staying at home? _______________

13. How many friends of your child speak the following languages?
• Cantonese only? _______
• English only? _______
• Both Cantonese and English? _______
• Other languages? _______
Appendix B

**Picture Naming Task**

*Items adapted from Cantonese/Mandarin CDI (Tardiff & Fletcher, 2008)*

1. Rice  
2. Noodles  
3. Pork dumpling  
4. Crab  
5. Soy sauce  
6. Green onion  
7. Brush hair  
8. Short (height)  
9. Small  
10. Sweet  
11. Sour  
12. Chopsticks  
13. Rice cooker  
14. Tea pot  
15. Mirror  
16. Stroller

*Items that are shared across Chinese and American cultures (Adapted from Yoon et al., 2004)*

1. Elephant  
2. Bear  
3. Horse  
4. Donkey  
5. Lion  
6. Wolf  
7. Fox  
8. Pen  
9. Leg  
10. Hand  
11. Hair  
12. Knee  
13. Foot  
14. Neck  
15. Ear  
16. Donkey  
17. Chicken  
18. Grasshopper  
19. Crayon  
20. Belly button  
21. Sheep
22. Forehead  
23. Cheek  
24. Harp  
25. Flute  
26. Tooth  
27. Tummy  
28. Paper  
29. Apple  
30. Orange  
31. Pear  
32. Strawberry  
33. Head  
34. Trumpet  
35. Paintbrush  
36. Sausages  
37. Taxi  
38. (Air)plane  
39. Boat  
40. Piano  
41. Car  
42. Train  
43. Bus  
44. Bee  
45. Cabinet  
46. TV  
47. Desk  
48. Sofa  
49. Bathtub

*Items adapted from the Bates-MacArthur CDI norm from children who grow up in mainstream American families (Dale & Fenson, 1996)*

1. Dog  
2. Broken  
3. Ladybug  
4. Kitchen  
5. Wash (verb)  
6. Money  
7. Walk (verb)  
8. Drink (verb)  
9. Pants  
10. Flower  
11. Grape  
12. Bird  
13. Bubbles  
14. Wet
15. Water
16. Dirty
17. Skirt
18. Shirt
19. Cup
20. Play (verb)
21. Bottle
22. Shoe
23. Cat
24. Window
25. T-shirt
26. Hug (verb)
27. Ball
28. Pizza
29. Cheese
30. Paper
31. Light
32. Blanket
33. Baby
34. Hat
35. Juice
36. Fly (verb)
37. Telephone

**Picture Identification Task**

*Items adapted from Cantonese/Mandarin CDI (Tardiff & Fletcher, 2008)*

1. Tea
2. Porridge
3. Pot
4. Tomato
5. Shrimp dumpling
6. Ginger
7. Cough
8. Barbeque pork bun
9. Toothpaste
10. Onion
11. Kite
12. Umbrella
13. Wok
14. Bitter
15. Suck (verb)
16. Tofu
Items that are shared across Chinese and American cultures (Adapted from Yoon et al., 2004)
1. Peach
2. Pencil
3. Watermelon
4. Guitar
5. Banana
6. Rabbit
7. Eye(s)
8. Toe
9. Spider
10. Violin
11. Pig
12. Ant
13. Duck
14. Fish
15. Crayon
16. Tuba
17. Tiger
18. Nose
19. Jeep
20. Beef
21. Truck
22. Arm
23. Boar
24. Lip
25. Pineapple
26. Drums
27. Motorcycle
28. Mouth
29. Deer
30. Cow
31. Beetle
32. Eyebrow
33. Mosquito
34. Bed
35. Chair
36. Table
37. Chest
38. Dresser

Items adapted from the Bates-MacArthur CDI norm from children who grow up in mainstream American families (Dale & Fenson, 1996)
1. Pillow
2. Jacket
3. Underwear
4. Cold
5. Milk
6. Bicycle
7. Balloon
8. Spoon
9. Key
10. Sweater
11. Eat
12. Open
13. Cry
14. Hot
15. Door
16. Ice cream
17. Cookie
18. Bath
19. Tree
20. Cake
21. Book
22. Fall
23. Outside
24. Bowl
25. Sock
26. Egg
27. Button
28. Fork
29. Computer
30. Soap
31. Big
32. Spaghetti
33. Kiss
34. Toothbrush
35. Bathroom
36. Puppy